



Ole Gunnar Austvik

# **The Norwegian State as Oil and Gas Entrepreneur**

The Impact of the EEA Agreement and EU  
Gas Market Liberalization

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## Preface

This dissertation comes after almost 25 years of research into Norwegian natural gas policy and European gas markets. In the mid 1980s, I published my first articles on these topics. I have continued to monitor developments both in Norway and in the EU, and also in Russia. One important reason for continuing to study these issues has been a conviction about its economic and political importance for all parties involved, not least for Norway. Another reason has been the wish to continue to increase the understanding of the fascinating and changing interaction between national and international economic and political actors, factors and mechanisms that continue so explicitly to characterize this industry.

The point of departure for this study is that the Norwegian petroleum industry was developed as a political enterprise by the Norwegian state from the early 1970s. As a political entrepreneur, the state was engaged in the industry as a production entrepreneur, as well as being a political and economic risk-taker. As a political entrepreneur the state defined social goals for activities and used regulative, legal and political measures to reach these goals.

Natural gas activities and their relations to an imperfect and international European gas market in its embryo demanded additional political efforts as compared with oil activities. Policies were developed with high ambitions with regard to national sovereignty and control of the industry, an optimal resource management, and to capture as much rent as possible. In addition to being the regulator, law and policymaker the state became itself an industrial actor, and in periods a substantial financial contributor to developments.

When Norway entered the 1990s and EU integration processes were increasingly evident, her petroleum policy and natural gas strategy was under

strong political control. The EEA agreement changed the legal framework for Norwegian domestic policy and economic activities in many areas, including the petroleum sector. In particular, it changed the institutional and regulative framework for natural gas production, transportation and sales, and the manner in which the state could continue to control the innovation of her comprehensive gas model. Furthermore, the liberalization of downstream EU natural gas markets changed the external economic and political maneuvering room for natural gas sales.

The focus for this dissertation is on how the EEA agreement and EU natural gas market liberalization processes have challenged the Norwegian state's natural gas entrepreneurship since the 1990s. Some sections of the study build on earlier publications. However, I hope it expresses more strongly and coherently than previous works the conviction of the importance of the topic, and the need to understand the strong interrelationships between economic and political forces, mechanisms and actors, if policy and market developments are to be properly understood.

I am most grateful to everybody at Lillehammer University College for cheerfully letting me continue to work on international oil and gas issues over the years. I must also thank the Norwegian "small state" with the accompanying and comprehensive networks of academic institutions, think-tanks, bureaucracy, politicians, industry and individuals that make it possible to engage with each other across formal delimitations. I especially thank those people that have commented on and helped structure the thesis over the past year, in the following alphabetical order: Dag Harald Claes, Lars Mjøset, Håvard Teigen, and Noralv Veggeland. Special thanks go to Stephen Dobson for proofreading the entire text, and assisting in the transition from Norwegian-English to English when necessary. The remaining errors in language, facts and analysis remain however, entirely my responsibility.

My thanks go also to Emmy, Markus and Nanna who have put up with a rather distracted father and husband during the process. Furthermore, I inherited my family's farm in the mid-1980s, at approximately the same time as I started to study the political economy of oil and gas. Kaldor farm has given

me the opportunity to engage also in practical work and private entrepreneurship, acting as supplement to theoretical concerns in the other areas. My final thanks therefore, to my parents, Johanne and Sverre, even if they both passed away in 2004, before the idea of writing this dissertation had taken shape. You all remind me that life most importantly consists of human relations, and not only political economy and conflicts about oil and gas.

Ole Gunnar Kaldor Austvik

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# Abbreviations

ATC	Average total cost
BCM	Billion cubic metres
BG	British Gas
BNOK	Billion Norwegian kroner
BP	British Petroleum
CAP	Common Agricultural Policy
CPI	Consumer Price Index
CC	Common Carriage
CEGB	Central Electricity Generating Board (U.K.)
CHP	Combined heat and power
CIS	Commonwealth of Independent States
CME	Coordinated market economies
Coreper	Committee of Permanent Representatives (EU)
DG	Directorate General (EU)
DOE	Department of Energy (U.S.)
DOP	Deliver or pay
EC	European Community
ECB	European Central Bank
ECSC	European Coal and Steel Community
EEA	European Economic Area
EEC	European Economic Community
EFTA	European Free Trade Association
EIA	Energy Information Agency (DOE statistical division)
EIP	Entrepreneurship Indicators Project
ESA	EFTA Surveillance Authority
EU	European Union
EU-6	Belgium, France Germany, Italy, Luxembourg and the Netherlands
EU-10	Cyprus, Czech Republic, Estland, Hungary, Latvia, Litauen, Malta, Poland, Slovakia and Slovenia
EU-12	EU-10 + Romania and Bulgaria

EU-15	EU-6 + Austria, Denmark, Finland, Greece, Ireland, Portugal, Spain, Sweden and the U.K.
EU-25	EU-15 + EU-10
EU-27	EU-15 + EU-12
FERC	Federal Energy Regulatory Commission (U.S.)
FIN	Ministry of Finance (Norway)
FPC	Federal Power Commission (U.S.)
FTA	Free Trade Area
FU	Forsyningsutvalget (Gas Supply Committee)
GATT	General Agreement on Trade and Tariffs
GDP	Gross domestic product
GEMA	Gas and Electricity Markets Authority (U.K.)
GFU	Gassforhandlingsutvalget (Gas Negotiation Committee)
IEA	International Energy Agency
INTSOK	Internasjonalisering av norsk sokkel ("Norwegian oil and gas partners")
IPE	International political economy
LDC	Local Distribution Company
LME	Liberal market economies
LNG	Liquified Natural Gas
LPG	Liquified Petroleum Gases
LRMC	Long run marginal cost
MBD	Million barrels per day
MC	Marginal cost
MFA	Ministry of Foreign Affairs (Norway)
MFN	Most favoured nation
MMBTU	Million British thermal units
MMC	Monopolies and Mergers Commission (U.K.)
MOA	Mandatory Open Access (IEA)
MPE	Ministry of Petroleum and Energy (Norway)
MITI	Ministry of Industry and Trade (Japan)
MTOE	Million tons of oil equivalents
NATO	North Atlantic Treaty Organization
NBIM	Norges Bank Investment Management
NCA	Norwegian Competition Authority (Konkurransetilsynet)
NCS	Norwegian Continental Shelf
NGA	Natural Gas Act (U.S.)
NGF	The "Norwegian Gas Factory"

NGPA	Natural Gas Policy Act (U.S.)
NGL	Natural Gas Liquids
NGU	Norges geologiske undersøkelser (Norwegian Geological Survey)
NOK	Norwegian Krone
NORSOK	Norsk sokkels konkurranseposisjon (Norwegian shelf competitive position)
NPD	Norwegian Petroleum Directorate (Oljedirektoratet)
NPM	New Public Management
OECD	Organization for Economic Cooperation and Development
OFFER	Office of Electricity Regulation (U.K.)
OFGAS	Office of Gas Supply (U.K.)
OFGEM	Office of Gas and Electricity Markets (U.K.)
OPEC	Organization of Petroleum Exporting Countries
OA	Open Access
PSA	Production Sharing Agreements
PV	Present value
QMV	Qualified majority voting
SDC	Shtokman Developing Company
SDFI	State Direct Financial Interests (Norwegian: SDØE)
SDØE	Statens direkte økonomiske engasjement, see SDFI
SGR	Strategic Gas Reserves
SMP	Special Market Programs (U.S.)
SO	Statement of Objections (EU)
SPR	Strategic Petroleum Reserves
SRMC	Short run marginal cost
SWF	Sovereign Wealth Funds
TOP	Take-or-pay (contracts)
TPA	Third Party Access
TSO	Transmission System Operator
USD	U.S. Dollar
VAT	Value Added Tax
WTO	World Trade Organization
WTP	Willingness to pay
WWI	World War I
WWII	World War II

## **Introduction**

This study focuses on how the European Economic Area (EEA) agreement and European Union (EU) natural gas market liberalization processes have challenged and changed the Norwegian state's natural gas entrepreneurship since the 1990s. The point of departure is that the Norwegian petroleum industry was developed as a political enterprise by the Norwegian state from the early 1970s. As a political entrepreneur, the state was engaged in the industry as production entrepreneur, as well as being a political and economic risk-taker. As a political entrepreneur the state could define social goals for activities and use regulative, legal and political measures to reach goals that private entrepreneurs do not have at their disposal. As a political entrepreneur the Norwegian state did not limit itself to the regulation of activities on the Norwegian Continental Shelf (NCS), but instead took on the role of innovator and leader of economic change and development.

Natural gas activities and their relations to the infantile, imperfect and international European gas market demanded additional political efforts compared to oil activities. The Norwegian state used several instruments in a combination to reach goals set up: regulations, direct participation and political interventions, and preferential treatment of Norwegian companies. Policies were developed with high ambitions with regard to national sovereignty and control of the industry, an optimal resource management, and to capture as much rent as possible. In addition to being the regulator, law and policymaker the state became itself an industrial actor, and in periods a substantial financial contributor to developments. Government policy and industrial structures changed as the industry matured, and markets, international affairs and technology changed. The state not only ensured the establishment of the industry, but maintained its role as a driving force looking after and contributing to change and evolution, to the intended benefit of the industry and the state itself, cf. Chapter 2.

When Norway entered the 1990s and EU integration processes were increasingly evident, her petroleum policy and natural gas strategy was under strong political control. The EEA agreement changed the legal framework for Norwegian domestic policy and economic activities in many areas, including the petroleum sector. In particular, it changed the institutional and regulative framework for natural gas production, transportation and sales, and the way the state could continue the control and innovation of her comprehensive gas model, cf. Chapter 3. Furthermore, the liberalization of downstream EU natural gas markets changed the external economic and political maneuvering room. However, the EU has not succeeded in fully liberalizing her natural gas markets. This study argues that markets for natural gas in the EU are and will remain largely imperfect and politicized for the foreseeable future, in which opportunities for adaptation, influencing developments and exercising entrepreneurship must be understood. The study therefore focuses on the effects on entrepreneurship, both from a perspective of a largely full liberalization in Chapter 4, and from a perspective of *de facto* liberalization in Chapter 5.

In this introduction, the aim and scope of the study is presented. Secondly, the argument is made for the choice of a multidisciplinary analytical approach based on endogenous growth theory and the disciplines of economics and political science within an International Political Economy (IPE) framework. The theoretical framework is outlined in Chapter 1. Thirdly, the approach is related to relevant other empirical and theoretical studies in the field. Fourthly and finally, propositions of how the Norwegian state's natural gas entrepreneurship has been changed and challenged by the EEA agreement and EU natural gas market liberalization are explicated.

### **Aim and scope of the study**

The special Norwegian policy created and developed for natural gas production, transportation and sales was based on a strong desire to control the value chain from the reservoirs and as far as possible down to consumers; in practical terms this largely meant to the borders of importing countries. Important policy measures were the establishment of a state oil company (Statoil), the regulation and optimization of production levels to favor Norwegian companies when

awarding licenses, protecting the supply industry, controlling the transportation infrastructure and maintaining concentrated gas sales. To begin with Statoil to a large extent implemented policy together with the Ministry of Petroleum and Energy (MPE). Later Forsyningsutvalget (FU, the Supply Committee) and Gassforhandlingsutvalget (GFU, the Gas Negotiation Committee), supervised directly by the MPE, replaced and supplemented important Statoil policy functions, cf. Chapter 2.

The state model (sometimes called the “Norwegian gas factory”, NGF) was made in the interplay between domestic and international factors and actors. A political consensus across party lines supported a state controlled entrepreneurship domestically. Discussions were not about whether or not the state should be engaged in the industry, but rather how. The nationalization of multinational oil companies in the 1970s supported a strong national policy. Significant price variations and the politicization of the European gas market changed the external framework for policy in the 1980s. The US embargo of Soviet gas in 1982, with a desire that Norwegian gas should replace Soviet gas and the British rejection of the Sleipner deal in 1984 were examples of external political pressures. Domestically, a gradual maturation of the industry and a new balance between political parties modified the situation. The model for natural gas entrepreneurship was eventually adjusted in the mid-1980s, but its state controlled style was retained.

The EEA agreement going into effect in 1994 made Norway a full participant in the EU Single Market in all areas except for agriculture and fishery. The European Free Trade Area (EFTA) Surveillance Authority (ESA) was set up to fill the control function towards EFTA participants in the EEA area (now only Lichtenstein and Iceland, in addition to Norway), similar to the control function of the EU Commission in relation to EU member countries. EU Single Market regulations and law from this point onwards also became Norwegian regulations and law, even though Norway through the agreement gained no voting rights over policy making. Through the 1990s the energy sector became part of the Single Market liberal restructuring processes. A special focus was placed upon electricity and natural gas markets, for which directives were eventually approved, and on the application of EU competition law. Strong pressure was

put on the Norwegian gas model, and as a consequence significant changes resulted in 2001/2002. The state now became more regulative than directly interventionist, but with substantial retention of control, cf. Chapter 3.

The scope of the EEA agreement was wide and influenced in principle every aspect of society, impacting on the competitive position of Norwegian individuals and firms. EU directives and competition law changed the maneuvering room and policy options for Norwegian natural gas entrepreneurship. They also made them different compared with other exporters to the EU gas market (to date Russia, Algeria and Libya). Among external suppliers, Norway was the only country directly affected domestically by EU rules. Other non-EU exporters (Holland has been the only intra-EU exporter) regulate their relationship with the EU and EU countries through bilateral agreements with a lesser impact on domestic affairs.

In addition to domestic effects of the EEA agreement, Norway was also affected by economic and political downstream market changes in the EU. The EU integration processes in general, and those for natural gas in particular, are of the greatest interest for Norway as exporter, even when they do not affect her legally at home. When EU make policy, or the market changes in a way that directly or indirectly affects prices, volumes and terms for operation, the maneuvering room can become smaller or bigger and the scope and number of policy options as a consequence change. As opposed to the effects from the EEA agreement, these effects are however largely shared with other exporters.

The EEA agreement, and degree and scope of the integration processes within the EU have together challenged the NGF by taking away opportunities for policy-makings, but also creating new ones. Together they contributed to the promotion of liberal ideological principles for economic activity, with an accompanying influence on Norwegian norms, institutions and law.

Gas market liberalization and developments continue to be debated in the EU. High energy prices and the wish of importing countries' for improved supply security and diversification of sources have increased the pressure for new political initiatives. There is a special focus on further policy harmonization, regulation of transmission and distribution on the EU level, infrastructural

developments, as well as external relations to exporters and environmental concerns. In addition, the EU is in general under continuous development, change and debate, and it is not clear to what extent the EU or EU countries will make policy in single areas.

The dynamisms of the processes, and the obstacles the EU faces in making the natural gas market “fully liberalized”, mean that changes for the NGF cannot be perceived within a static picture based upon a one-time change from one equilibrium to another. The processes continue to challenge the formulation and goals of Norwegian natural gas policy and entrepreneurship. Chapter 4 discusses the effects of potential full market liberalization on the Norwegian state natural gas entrepreneurship. As this study does perceive the market to become more open and flexible, but not fully liberalized in the foreseeable future, Chapter 5 discusses impacts from *de facto* market liberalization,

## **A multidisciplinary approach**

The study draws upon endogenous growth theory to understand the role of the Norwegian state as a political entrepreneur in the creation of her petroleum industry. Endogenous growth theory demonstrates that policy, entrepreneurship and innovation, and not only changes in exogenous factors, have an impact on the long-run growth of an industry, and more general on an economy. The disciplines of economics and political science are used to understand EU integration processes and their impact on national policy making. The theoretical choices are made to reach a comprehensive understanding of how changes in, and Norwegian relations to, the European natural gas market and EU integration processes have influenced the state’s entrepreneurial maneuvering room and policy choices. There are additional reasons for this choice of a multidisciplinary approach.

Firstly, for the state entrepreneur to endogenously promote development and respond properly to exogenous change it must take into consideration all relevant information about maneuvering room and possible choices of action. The insight needed to make comprehensive decisions in developing (and defending) an industrial enterprise, comprise knowledge about constraints and opportunities of

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a physical, economic, legal, political and ideological character, and not to embrace only on an unidisciplinary understanding. These factors are discussed theoretically in Chapter 1.1 and are represented empirically by the list of goals and policy measures taken and developed for the Norwegian gas model, outlined in Chapter 2.1 and 2.7.

Secondly, the energy industry and markets function according to and are governed by highly politicized mechanisms and decisions. Political and organizational forces determine actual outcomes together with economic and technological imperatives. The eclectic nature of energy policy and understanding of energy markets make it necessary to draw upon more than one discipline in their analyses:

*To understand the oil and gas industry "... explanations have to encompass essential interdisciplinary elements" (Rees and Odell 1987:2).*

*"All too often... research topics have been narrowly, perhaps parochially, defined, the disciplines have developed methodologies and even languages peculiar to themselves, and research results have been disseminated in forms comprehensible only to the disciplinary cognoscenti" (ibid:x).*

Both supply and demand sides are heavily politicized, as outlined in Chapter 2.1. Oil consuming nations intervened in the oil industry since the early twentieth century.

*"Against this backdrop, the oil exporter governments are latecomers in defending their interests through special taxation and state participation, which commenced only after 1945" (Noreng 1999:190).*

Thirdly, economic integration leads to political integration and legal, institutional and ideological change. To grasp the full effects of the interplay between these qualitatively different factors, changes in one factor must not only be identified and analyzed in terms of how it influences national policy directly, but also by its indirect effects on other relevant factors and mechanisms. The mechanisms of these interactions are outlined theoretically in Chapter 1.2-7; their legal impacts on the Norwegian natural gas entrepreneurship are discussed empirically in Chapter 3; while Chapters 4 and 5 discuss impacts from full and *de facto* EU gas market liberalization processes, respectively.

Even if a complete picture is only obtained by integrating all relevant disciplines in the analysis, this study concentrates primarily upon economics and political science, and their interaction. The difference between economic and political analyses is not always clear; they often study the same questions. Economic analysis, however, largely focuses on income and wealth creation and distribution within a political and market framework (as for example demonstrated in the seminal work of Samuelson 1947/1983). Political analysis, on the other hand, focuses more on state power, institutions and national interests as major factors within the framework of realist theory (such as Morgenthau 1948, Waltz 1959), and mutual gains of cooperation and complex interdependence with other states in the framework of interdependence theory (such as Cooper 1968, Keohane 1984).

In a political economy approach we attempt to combine these different ways of looking at the world. By using the discipline of political science we study how a state, or a group of states make complex (and often multilayered and interactive with others) decisions about who will produce how much gas where and when, how the market is functioning and who as consumers are to get what, when and how. By using the discipline of economics we study how natural gas as a non-renewable resource is produced, transported and allocated to different markets and users through more or less decentralized market processes. Since Norwegian – EU gas relations are international, we bridge the disciplines of economics and political science within the IPE framework by combining them in a multidisciplinary fashion.

Adopting a *multidisciplinary* approach, disciplines are combined by aggregation (Augsburg 2005). Multidisciplinarity is a non-integrative mixture of disciplines where each discipline retains its methodologies and assumptions, unaffected by changes and developments in other disciplines. Two disciplines may study various aspects of an object and integration is achieved by combining the two partial studies, or by taking conclusions from one discipline and using them as input factors in the research of the other discipline. It is, to some extent, possible to translate the consequences of a political event to changes in economic variables, and vice versa. A change of regime in Russia can for example primarily be dealt with through political analysis; preferably of a realist type. The effects

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from the change on factors, such as production capacity, and strategies for her natural gas production and gas sales can be understood on the basis of its consequences for petroleum policy. These effects can in their turn be dealt with from within the field of economics in order to study impacts on markets and prices.

With a multidisciplinary relationship the cooperation between the disciplines

*"..may be mutual and cumulative but not interactive" (ibid:56),*

while *interdisciplinarity* on the other hand blends practices and assumptions of each discipline involved. Interdisciplinarity combines disciplines in a common core of concepts and methods;

*".. the roots of the concepts lie in a number of ideas that resonate through modern discourse – the ideas of a unified science, general knowledge, synthesis and the integration of knowledge" (Klein 1990:19).*

Interdisciplinarity attacks a subject from various angles and methods, eventually cutting across disciplines to form a new method to understand the subject. Klein (1996) discusses how common goals and understanding unite the various methods, and is acknowledging a common shared subject or problem even when it spreads to other disciplines. The extent to which it is possible to combine qualitatively different values and motivations between actors in a common core of concepts is not always clear. Interdisciplinarity is therefore, a more demanding approach than multidisciplinary.

A closer understanding of uncertainty is important in explaining this choice of analytical approach and the importance it has for a political industrial entrepreneur. Godet (1987, 2006) identifies three types of multi- and interdisciplinary uncertainty: trivial, systemic and structural. The type of uncertainty that is dealt with by using more of the same model he calls *trivial*, namely providing more information to support the model in use and to refine the model. Trivial uncertainty can be reduced by what Godet phrases "good disciplinary work", without the involvement of other disciplines.

*Systemic* uncertainty refers to the inadequacy of understanding, rather than because there is a lack of knowledge based upon facts and refinement. Such a

type of uncertainty may be dealt with by extending disciplinary boundaries in a multi- or interdisciplinary manner. How economics and politics interact in the EU and her markets for natural gas is an example of such insight. In principle, it is possible to arrive at a consistent understanding of such relationships and dimensions. Similar to a system of equations used in an economic model linking variables to each other, the value of one variable can be endogenously determined as a result of exogenous changes in other variable(s). If the model still involves degrees of freedom, the importance of choices and strategies of actors can be determined.

Finally, *structural* uncertainty is inherent to the type of phenomena being studied. Structural uncertainty represents exogenous fluctuations in important variables and relationships, uncertainty in the choice of model, and situations where a model gives results with great variations.<sup>1</sup>

The two first types of uncertainty can (theoretically) be dealt with, as in our IPE framework, while the third kind cannot fully be eliminated. The actors can only learn to live with structural uncertainty and seek ways of reducing the problems it creates. Methods must be found to deal with structural uncertainty, rather than trying to eliminate it. The process of clarifying the kind and magnitude of structural uncertainty may, however, be an important input in seeking to find a form of adaptation. The act of entrepreneurship is often confronted with the need to understand both systemic and structural uncertainty, particularly when it comes to bringing something really novel to the world, such as building the Norwegian petroleum industry from nothing. As risk-taker an

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<sup>1</sup> In economics the concepts of risk and uncertainty share similarities with these definitions. Knight (1921:I.I.26) understood "risk" as randomness with knowable probabilities and "uncertainty" as randomness with unknowable probabilities:

*"The essential fact is that "risk" means in some cases a quantity susceptible of measurement, while at other times it is something distinctly not of this character; and there are far-reaching and crucial differences in the bearings of the phenomenon depending on which of the two is really present and operating. ... It will appear that a measurable uncertainty, or "risk" proper, as we shall use the term, is so far different from an unmeasurable one that it is not in effect an uncertainty at all. We ... accordingly restrict the term "uncertainty" to cases of the non-quantitative type."*

Within economics, Knight's definition of risk is associated with the term systemic uncertainty Godet is using in the understanding of how systems and markets are working. Godet however, proposes a wider understanding of the overall framework for markets. Knight's use of the term uncertainty parallels Godet's term structural uncertainty.

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entrepreneur typically operates in situations where outcomes are uncertain and where she considers the structural uncertainty (or risk) to be an opportunity worth exploiting, and that she is capable of doing it. A manager of a project, in contrast, will often confine himself to understand trivial and perhaps systemic uncertainty and to act as professionally as possible in dealing with it, and avoiding situations where he faces strong elements of structural uncertainty.

An essential part of any analysis entails distinguishing endogenous from exogenous events. The endogenous elements can be understood through analyses of trivial and systemic uncertainty. These uncertainties depend not only on whether enough information is provided, but also on whether the understanding of interaction between economic, political and other factors and mechanisms is sufficient, and, accordingly, whether or not the information is *adequate*. This identification and measurement of parameters are crucial for the analysis. Even if an analysis is brilliantly performed in a technical sense, this brilliancy cannot outweigh the mistakes created by a wrong choice of data, low quality statistical input or an irrelevant model. That is, unless the purpose is to practice using a chosen model and relevance to the problem at hand, is of a more minor concern. Obviously, there are no limits as to what could be included in the assessment of almost any issue. The challenge is to set up an adequate choice of parameters, such that the desired level of in-depth discussion is made possible. If we delve too deeply into the material or choose too many parameters, the overall process can be paralyzed by details. On the other hand, if we take too few parameters into consideration on a too superficial level, we can lose sight of important input.

The endogenous determined outcomes of a process set frames for future development and outline possible economic and political paths. These frames should be rather insensitive to possible and significant changes in the parameters, and at the same time, indicate the maneuvering room for state policy.<sup>2</sup> But as in fact "anything can happen in the future", it is useful also to discuss which extreme events are necessary to achieve outcomes beyond the frames that the analysis predicts as possible. A *sensitivity analysis* is first of all of heuristic value, as it illustrates and provides a background for evaluating how "robust" the results

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<sup>2</sup> This parallel linear programming in mathematics.

from the analysis might be. In Chapter 6.2 we will do this in an evaluation of the chosen theoretical approach in this study.

In periods of stability, pure economic and political approaches may have considerable explanatory power. Their periodic success at the same time entails a certain risk. As they are often based on assumptions, that the future will look much like the past, they rarely take into account the possibility of multiple, large and more fundamental changes in markets, the behavior of firms and policy makers, and political events. If we get used to a model being right for a while, and start extrapolating trends, the limitations (assumptions) under which it was applied may easily be forgotten. An unidisciplinary analysis can however, successfully be used, understood and interpreted within the framework of a multidisciplinary analysis. For a state industrial entrepreneur, when discrete events take place or radical policy change implemented, unidisciplinary approaches can be helpful in analyzing the strength, mechanisms and character of factors and the partial effects of actions. The primary challenge for the entrepreneur will however be linked to understanding the interplay between the qualitatively different forces and to identify where and when it matters that entrepreneurial actions are taken.

There are advantages and disadvantages with such a multi- (or as here duo-) disciplinary approach. The understanding of relationships at an aggregated level improves, but the more or less exact outcomes, as produced from single economic or political theories and methods are often lost. In one dimension, we have a lower ambition level than more deterministic and unidisciplinary models. On another dimension, we have a higher level of ambition. As we are pulling several types of explanatory variables together, we should be able to provide a better understanding of the economic and political relationships evident in a strongly politicized European gas market, and hence of the challenges the Norwegian state has been and is facing as a natural gas entrepreneur.

Although the overall aim in this study is to understand the integration processes' impact on a broader conception of entrepreneurship, it also utilizes many partial approaches as important elements in the analysis:

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*“More focused theories - each of course consistent with the assumption of the overall rationalist framework - are employed to explain each element. The elements are then aggregated to create a multicausal explanation of a large complex outcome...”*  
(Moravcsik 1998:20).

In this study the disciplinary methods of economics are used to analyze price and contractual effects of liberalization, the implication of the non-renewable nature of natural gas on market outcome, the regulatory issues connected with transmission and distribution, and the effects of gas consumption taxes. This also largely accounts for the use of endogenous growth theory to understand the behavior of the political entrepreneur. In analyzing the effects of negotiation processes, game theory is appropriated. The perspective of political science is used to study institutional and ideological effects of economic integration; (EU) integration processes as depicted through discussions of neo-functionalism, intergovernmentalism, institutionalism and constructivism; the interaction between domestic and external agents in these processes; and the discussions of the role of international affairs and security-of-supply in EU gas market restructuring. The partial analyses all serve as input for the entrepreneur in defining his multidisciplinary maneuvering room, as well as offering advice on policy choice.

Determining how to *measure* changes in entrepreneurship is however a challenging task in itself. While there is considerable interest in entrepreneurship and innovation processes world-wide there are, as of yet, no common concepts and definitions, or agreed upon list of key indicators that are required to improve the collective understanding of entrepreneurship and its impacts, although the need appears obvious.<sup>3</sup> Entrepreneurial activity, firm creation and business growth all occur within a complex, dynamic, and in our case politicized sector and economy. The measurement of political entrepreneurship can be considered even more complex than the challenges arising to the measurement of private entrepreneurship as it involves a wider set of objectives, and instruments to be

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<sup>3</sup> The OECD has however started an Entrepreneurship Indicators Project (EIP) that will explore options to define and measure entrepreneurship, factors that influence entrepreneurship and impacts or outcomes of entrepreneurship (OECD 2006).

used. The Organization for Economic Cooperation and Development (OECD) however sets out that;

*"The practical definition and measure of entrepreneurship that one chooses will ultimately depend on the nature of the policy objective" (OECD 2006:15).*

Following this view as a point of departure we will identify and measure impacts from Norwegian - EU and EU integration processes on the Norwegian state's natural gas entrepreneurship by changes in ability to reach goals, through changes in maneuvering room and policy options, and to some extent by changes in the goals themselves.

The objective of the study is in part a question of the degree of policy convergence between Norway and the EU. Convergence of policy goals and policy itself across countries has been examined both theoretically (Bennett 1991, Seeliger 1996) and empirically (O' Connor 1988, Gibson and Means 2000, Montanari 2001). Convergence is often defined as the tendency that countries become more similar over time in their main economic, political, cultural, institutional and government policies. Convergence theories have often been evolved and associated with changing trends, such as modernization, industrialization, post-industrialization, globalization and integration. Inkeles (1981:13) argues that convergence research refers to such trends:

*"Convergence means moving from different positions towards some common point. To know that countries are alike tells us nothing about convergence. There must be movement over time toward some identified common point".*

Thus convergence research operates with inter-temporal dimensions and goes further than ordinary comparative research, which often simply examines the degree of similarities between investigated objects. Seeliger (1996:293) argues that the criteria of similarity can be imprecise, since

*"being similar or different is a matter of degree and the cut off point can be set arbitrary".*

Changes in policy are usually caused by complex and multidimensional sets of factors, embracing policy objectives, content, instruments and outcome, along

with policy style (Bennett 1991). Hence, impacts from the integration processes on both entrepreneurship and policy convergence are multi-faceted and dynamic.

A number of other forces for policy change than the integration processes with the EU confuse the picture. The way Norway and the EU defined interests and formulated energy policies in the 1970s and 1980s was conditioned and affected by the internal and external economic and political factors and actors at the time. Gradually, and in some important cases radically, these factors have changed. For example, with the 1991 collapse of the Soviet Union and the end of the bipolar world and diverging economic and political systems, the world became more politically integrated than before. Political systems changed and international affairs and trade relations became more globalized and in a situation of flux. Both the EU and Norway had to formulate new policies. The traditional social democratic system of Norway moved towards a greater degree of liberalism and so did also the EU. Economic, political, informational and technological changes and the acceleration of world globalization and integration paved the way for degrees of convergence in how mutual interests, positions and policies of countries were formulated. Some of these changes were connected with the finalization of the Uruguay round and the establishment of the World Trade Organization (WTO), the EU Single Market in 1993/94 and the introduction of the euro in 1999.

Furthermore, not only political factors influenced the situation. Neither EU gas markets nor the Norwegian petroleum industry were in their infant stages in the 1990s and beyond. Different policy was needed for both as compared to in the 1970s and 1980s. Another aspect was changes in the profitability of the petroleum industry, which besides costs depends heavily on the price of oil. Relatively low oil prices in the period 1986-2001 led to a low attention to security-of-supply issues in the EU and elsewhere. Higher prices after 2001 have on the other hand, brought back the attention to the profitability of the industry and long-term supply and prices, as in the period 1973-1985. The higher prices are the source of more income for producing countries and have political spillovers that increase their influence, as well as provide an incentive for the EU to think more comprehensively about her energy policy.

Political and non-political factors together contribute to challenge the maneuvering room and policy options, and partly also the goals for Norwegian natural gas entrepreneurship. Hence, part of the challenge in this study of identifying and measuring impacts from economic integration processes on political entrepreneurship, is to isolate them from other forces and factors. In some situations, changes from one force can be discrete and substantial in scope and / or strength, or induce dynamic processes for incremental change. In other situations other forces can have the strongest impact, with accompanying changed constraints and opportunities for action for involved parties.

### **Relations to other studies**

To understand the Norwegian state's building and development of her natural gas industry, this study has extended the use of endogenous growth theory to include political entrepreneurship, as undertaken for the entire Norwegian petroleum sector in Austvik (2007), cf. Chapter 2. Endogenous growth theory has mostly been used to study private entrepreneurship (as for example demonstrated in Fagerberg, Mowery and Nelson 2005, and in Hanusch and Pyka 2007). Entrepreneurship

*"is the ability to amass the necessary resources to capitalize on new business opportunities...They build something from practically nothing...words that characterize entrepreneurship include innovative, creative, dynamic, risk-tolerant, flexible and growth-oriented" (Kayne 1999:3).*

The characteristics of a political entrepreneur share many similarities with a private entrepreneur as she/he enters into the role of innovator and leader of economic change. A political entrepreneur can however define social (as opposed to private) goals for economic activities and use regulative, legal and political measures to reach goals that a private entrepreneur does not have at their disposal (Eisinger 1988). Nevertheless, studies of private entrepreneurship have had limited (albeit not zero) focus on the political economy of entrepreneurship, not to say on the main focus in this study; namely political entrepreneurship itself, as defined and outlined theoretically in Chapter 1.1.

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To understand EU integration processes from the 1990s, and how the Norwegian natural gas entrepreneurship was challenged by these, an IPE framework is used. The

*“emphasis on political economy perspectives is particularly important in the context of European integration” (Jones and Verdun 2005:2).*

The term ‘political economy’ was originally used to designate the founders of modern economics, like Adam Smith and David Ricardo, and also Karl Marx. The alternative would be using only economics or political science as analytical approach. Over the past decades the mixture of the two disciplines has increasingly been dealt with by political scientists:

*“With the increasing quantification of the economics discipline and the increasing use of mathematics and formal models in that discipline, the study of the intersection of international politics and economics slowly became abandoned by economists and increasingly occupied by political scientists” (Verdun 2005:15).*

In an IPE approach, social and cultural environments and historical developments are drawn upon in the combination of economic and political ways of looking at people and businesses in the real world to grasp society’s fundamental nature (Balaam and Veseth 2005:6). Analyses within this framework can make use of unidisciplinary tools, while the overall challenge is generally how to understand different factors, actors and mechanisms as they interact, as demonstrated in general IPE studies and text-books (such as Balaam and Veseth 2005, Cohn 2005, Gilpin 2001, O’Brian and Williams 2007, Oatley 2008)..

Other studies of EU and European integration processes have been using both disciplinary and inter-disciplinary approaches; in the field of economics (Baldwin and Wyplosz 2006, Hitiris 2002, Jovanovic 2005, Molle 2006, Nea 2007 and in international economics textbooks, such as Krugman and Obstfeld 2006, Salvatore 2007, Austvik 2002); in the field of political science (Bache and George 2006, Cini 2007, Hay and Menon 2007, Wallace, Wallace and Pollack 2005); and in the field of political economy (Artis and Nixon 2001, El-Agraa 2007, Harrop 2000, Jones 2001, Jones and Verdun 2005, Talani 2004, Tinggaard Svendsen 2003). All these studies include discussions about how participating nation states are affected by economic integration. In the field of economics, discussions generally follow

liberal neo-functionalist and market logics about how institutions and policies (should) change when a country enters into deeper levels of integration with other countries. The political approaches often contrast or complement this view with various degrees of intergovernmental, institutionalist and constructivist understandings of the political development of the EU. The political approaches also attempts to explain whether or not, and if possible how, nation states influence the EU. The political economy approach combine economics and political science analyses in an international (cross-national border and with relations and policy-making between nation states) setting, comparing the different perspectives from the two fields with the goal of understanding economic integration processes. These unidisciplinary and interdisciplinary studies within an IPE framework represent the backdrop for the understanding of the effects and dynamics of the political economy of European integration in this study, and are outlined in a theoretical manner in Chapter 1.2-1.6.

To understand the effects of European integration processes on the maneuvering room and policy options for Norwegian natural gas entrepreneurship, the study argues that it is necessary to understand how qualitatively different factors, actors and mechanisms influence both EU integration processes and the entrepreneurship through a multifaceted and dynamic set of economic, political and legal factors. Other studies of Norwegian and EU natural gas policy have used both disciplinary and interdisciplinary approaches; in the field of economics (such as Aune, Golombek, Rosendahl and Kittelsen 2000, Golombek, Gjelsvik and Rosendahl 1995, Golombek, Kittelsen and Ove 2000, Austvik 2000); in the field of political science (such as Bergesen and Sydnes 1990, Bergesen, Estrada, Moe and Sydnes 1998, Estrada, Bergesen and Martinsen 1995, Matlary 1991 and 1993, Noreng 1991, Sæter 1991); and in various political economy approaches (such as Bartch 1999, Claes 2002b and 2003, Odell 2001, Stern 1990 and 1998, Austvik 1997). None of these studies have however applied endogenous growth theory to understand the political entrepreneurship of the Norwegian state in the creation and development of her petroleum and natural gas resources, cf. Chapter 2. As a consequence, a combined understanding based upon a multidisciplinary way of empirically analyzing how

the interaction between economics and politics in EU integration processes affects a political entrepreneurship has yet to be attempted.

## **Study propositions**

The study focuses on how the Norwegian state's natural gas entrepreneurship has since the 1990s been changed and challenged by legal, economic and political factors and mechanisms connected with the EEA agreement and EU natural gas market liberalization processes. The goal is to argue for and isolate the strength, scope, relevance and direction of changes in its maneuvering room, goals and policy choices. These will be attempted isolated from impacts traceable to industrial and market maturation, changes in international and global affairs, changes in other energy markets and technological change. The main propositions are:

*Firstly*, the EEA agreement made the Norwegian domestic political maneuvering room legally smaller and contributed to making a strong state controlled industrial and resource management system more regulative, than direct and of an interventionist type, cf. Chapter 3. The impact of these changes was however modified by an active reorganization of the petroleum industry through entrepreneurial efforts initiated by the Norwegian state in 2001/2002, in order to maintain much of the purposes of her gas model, including more direct state participation. Nevertheless, the EEA agreement made Norway more limited in the formulation of her domestic and foreign energy policy compared to other exporters of natural gas to EU markets.

*Secondly*, a liberalization of EU natural gas markets leads to more volatile and independently determined natural gas prices, as well as more pluralistic and short-term contracts, cf. Chapter 4. Together with increased market maturity, EU market liberalization efforts created a need for Norway to have a more flexible way of selling gas, than under the relatively rigid GFU arrangement. As present EU natural gas market liberalization is by no means complete, and the domestic changes in the national gas model are less dramatic than a competitive market design indicate, the effects on Norwegian downstream activities have been

moderate compared to how Norway would have acted anyway when confronted by increased industrial and market maturity.

*Thirdly*, the impediments in EU market liberalization make the maneuvering room for Norwegian policy making different compared to a situation in which the market was fully liberalized. Four main constraints to a perfectly and completely liberalized EU natural gas market are identified in Chapter 5: a) the mainly confederative structure of the EU, b) the politicization of trans and intercontinental European energy trade and the issues of security-of-supply and security-of-demand, c) the non-renewable nature of natural gas; and d) regulatory challenges in markets which are by nature imperfect. These constraints modify *de facto* outcomes from the liberalization processes, and change (and possibly increase) the potential for influencing developments and entrepreneurial actions both for Norway and the EU, compared to a situation with a (theoretical) text-book type liberal market design.

The study is structured as follows: Chapter 1 discusses theoretically how the political maneuvering room and policy options for a state's industrial entrepreneurship is affected by an international economic integration process, emphasizing economic integration in the EU. Chapter 2 outlines how the Norwegian state built the petroleum industry and developed a national natural gas strategy as a political entrepreneur. Chapter 3 focuses on how the EEA agreement changed the NGF by legal means. Chapter 4 discusses the effects of a more or less ideal EU market liberalization, on the Norwegian state's natural gas entrepreneurship. Chapter 5 analyses main constraints to the complete liberalization of EU gas markets, and their modifying consequences for the Norwegian entrepreneurship compared to full liberalization. Chapter 6 draws the analysis to a close by presenting conclusions, and including a summary of the main empirical findings. This final chapter also offers an assessment of the dissertation's chosen theoretical approach and its implications for further research, along with an assessment of how it may contribute to understanding Norwegian petroleum policy and the Norwegian - EU relationship, respectively. Finally, comments on possible theoretical implications are offered.



# 1 Economic integration and political entrepreneurship

This chapter explores how the maneuvering room and policy options for a state's industrial entrepreneurship are affected by international economic integration processes, and emphasize economic integration in the EU. Firstly, a theoretical foundation for the understanding of a political industrial entrepreneurship is offered with a point of departure in theory for endogenous growth. Secondly, the chapter focuses on welfare effects of economic integration. Thirdly, levels of and theories for European integration are reviewed. Fourthly, the dynamics of economic integration processes are discussed. Fifthly, exogenous change as a source of domestic policy change is analyzed. Sixthly, the dynamic interaction between domestic and external agents in international negotiations is analyzed. Lastly, the impacts of economic integration on a national political industrial entrepreneurship are discussed.

## 1.1 Endogenous growth and the political entrepreneur

Entrepreneurship is about generating new businesses. The entrepreneur is the person(s) who organizes the process with the goal of developing an enterprise. An intrapreneur, by contrast, develops a business already in existence. Schumpeter's theories for economic growth and the role of the entrepreneur have been considered particularly influential in the literature (Spilling 2005:5). Schumpeter (1934/96) emphasized that economic development is dynamic, and that the entrepreneur is the driving force for change and development. Neoclassical models, on the other hand, emphasized economic growth as exogenous. For example, the Harrod-Domar (Harrod 1939, Domar 1946) and Solow (1956) growth models demonstrated that the rate of saving, technological

change and growth in the labor force leads an economy *exogenously* into a specific growth trajectory.

Baumol (1968) argued strongly against the use of this type of 'mainstream' economic theory when excluding the importance of entrepreneurship. He emphasized Schumpeter's argument that economic development is primarily caused by endogenous change, or the ability to exploit exogenous change. A change is often to do something new that creates or exploits imbalance in markets. In many endogenous growth models, although not all, the assumption of perfect competition is relaxed, and some degree of monopoly power is thought to exist. Hayek (1949) believed that neoclassical economics neglected entrepreneurs because market equilibrium assumes that full information leaves entrepreneurs with little maneuvering room. Markets however, can be considered to exist in a constant (at least potential) state of disequilibrium caused by new products, production methods, markets, production factors, raw materials, or organizational models (Kirzner 1973). An invention is accordingly only one out of several forms of innovation. An entrepreneur arrange for that one or more changes takes place (often in a combination) in order that an innovation can take place and lead to increased productivity and profit. Innovation is accordingly endogenous, such that it is important what and how individuals, businesses and society adapt. Schumpeter argued that the entrepreneur is the decisive force determining whether or not an innovation process will take place. Crucial importance is usually assigned to the production of new technologies, organizational models and human capital.

Romer (1991) put forward the view that growth and change results from the intentional actions of people engaged in research and development, and is increasing rather than decreasing return to scale in economic development.

*"People are reasonably good at forming estimates based on addition, but for operations such as compounding that depend on repeated multiplication, we systematically underestimate how fast things grow." ... "For a nation the choices that determine whether income doubles with every generation, or instead with every other generation, dwarf all other policy concerns" (Romer 2007, [www.econonlib.org](http://www.econonlib.org)).*

Often endogenous growth theory assumes constant aggregated marginal productivity, or at the very least that it does not tend towards zero, as is usually assumed in simple versions of standard microeconomic theory. The engine for growth can be referred to a situation with constant return to scale but also as in more complicated set ups with spill-over effects, increasing numbers of goods, increasing qualities etc and increasing return to scale (*ibid.*, Kaldor 1981).<sup>4</sup>

Innovation processes may be incremental, but sometimes they follow discrete or radical events or actions. The cumulative effect of incremental innovations can over time be more important than the effects of radical change (Fagerberg 2005:4-5). The actions by an entrepreneur may also yield spin-off effects for others who can use the same approach in the same or another context. Schumpeter grouped the latter as an imitator of the first, as known in the product cycle theory (Posner 1961, Vernon 1966). However, to put established knowledge into a new context can be an innovation in itself. Røvik (2007) discusses how high competence in translating ideas and knowledge from one area, into the practices of another is essential for successful organizational restructuring (and innovation) processes.

Evolutionary economists, who may be considered a branch of endogenous growth theorists, argue that most decisions made by firms and consumers are taken in a habitual manner because their rationality is bounded (Nelson and Winter 1982). Markets are to be understood as selecting firms on the basis of their routines. Firms with low productivity routines lose market shares and will eventually exit the market, while firms with high productivity routines gain market shares and prosper (Reinert 2007). Less successful firms also try to copy the routines of more successful firms through imitation, while new routines are introduced in the market through innovation. Firms search for innovations that open new markets and give them a temporary monopoly, until rival firms start to imitate (Schumpeter 1942). Evolutionary economic theory implies that firms have to acquire a set of routines that are fit relative to those of competitors, and that

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<sup>4</sup> Since the 1980s, endogenous growth theory (sometimes also called “new growth theory”) has been discussed by a number of researchers. There exist variations in to how to understand aspects of the theory. The references have been selected for this study according to how they contribute to define a political entrepreneurship in a manner which is useful for this analysis.

are hard for competitors to copy. The growth of firms can then be understood as a process of diversification, in which a particular set of routines are applied.<sup>5</sup>

In this context, an important distinction can be made between entrepreneurship and management of a business. An entrepreneur develops and organizes new activity, which is different from leading an existing and established enterprise (Spilling 2005:7). If this is done in ways that copy other's practices, it doesn't represent a new combination. Instead, it will be an imitation (ibid:15). On the other hand, an entrepreneur (alone or with others) is the one who organizes processes that implement change. An enterprise (or intraprise) is the realization of a project that put changes into effect. An entrepreneur can start a new enterprise and is then a 'gründer' (founder). The one, who provides capital for the enterprise, may or may not be the same as the entrepreneur.

Entrepreneurs are often contrasted with managers and administrators who are said to be more methodical and less prone to risk-taking. With persistence and determination, the entrepreneur develops strategies to transform visions into reality, often risking career and financial security on a project.

*"Being entrepreneur means being alert to profit opportunities" (Harper 1992:24).*

Entrepreneurs take risks in the name of an idea on an uncertain venture (Knight 1967, Drucker 1970). Risk is generally measured in terms of impact and the likelihood of an event, and considered proportional to the expected losses which it can cause and the probability of its occurrence. Risk is a state of uncertainty where some possible outcomes have an undesired effect or significant loss. The harsher the loss and the more likely the event, the greater the overall risk.

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<sup>5</sup> Evolutionary economics builds on works from the 1940s and 1950s (such as Schumpeter 1942, Simon 1957, Penrose 1959) and emerged as a branch of economic theory in the early 1980s. It started as a critique to mainstream economics that seeks to explain economic phenomena from the perspective of the rational choice of profit maximizing firms and utility maximizing consumers. As a market theory, evolutionary economics has mainly been applied in the field of industrial organization, organization theory and management science (Frenken 2007).

Uncertainty (or the lack of certainty), is a situation where it is impossible to describe in a precise manner the existing state of affairs or future outcomes; there exists more than one possible outcome from a process (Hubbard 2007). This parallels the term structural uncertainty as discussed in the Introductory chapter. As opposed to often rather risk-averse managers, entrepreneurs are generally

*“independent, pragmatic and ambitious” (Collins and Moore 1970),*

and often extreme optimists in the believe in the success of their enterprise, in spite of the often strong possibility of failure and the bad record of many other entrepreneurs (Cooper, Woo and Dunkelberg 1988, Busenitz and Barney 1997). Entrepreneurship is however often an *ex post* term:

*“.. entrepreneurial activities require a passage of time before their true impact is evident” (Martin and Osberg 2007:30).*

If he or she does not succeed, he or she is instead considered a business failure, rather than an entrepreneur (or entrepreneuse).

Physical and intellectual infrastructures, regulations, laws, institutions and the shape of international markets and regulations are paramount for all innovation processes. It is customary to think of entrepreneurs as persons who develop private businesses as actors within existing economic, legal and political frameworks. We will however, use the concept to discuss the role of the Norwegian government (or state) as a *political entrepreneur* in developing the Norwegian (oil and) natural gas sector. In this context, these frameworks must not be considered exogenous to entrepreneurial action, but factors that can be endogenously changed in order to promote the success of the enterprise.

The definition of a political entrepreneurship is however ambiguous in the literature. Taewook (2004) refers for example to a political entrepreneur as

*“a political player who seeks to gain certain political and social benefits in return for providing the common goods.”*

Schneider and Teske (1992:737) argues that the political entrepreneur is

*“the individual who changes the direction and flow of politics”.*

Abel (2003) uses the term to discuss a person who coordinates a political process in a market for politics. Potential entrepreneurs can be attracted to the political environment if the possible benefits encountered of entering the political area and succeeding as political entrepreneurs are considered greater than the costs (Ricketts 1987). Schneider and Teske (1992:737) argue that these costs

*“are a function of the collective action problems entrepreneurs’ face and the ease with which these problems can be solved.”*

They contend that the ease with which collective actions are undertaken depends on the organizational environment of the community.

By contrast to these definitions of a political entrepreneur, in this study we focus on a government or a state system that acts in an entrepreneurial way in order to create economic activities, with the private sector as full or partial commercially collaborating actors.

*“Public sector entrepreneurship occurs whenever a political or governmental actor is alert to and acts on potential profit opportunities” (Shockley, Frank and Stough 2002:12).*

This type of a political entrepreneur takes the initiative in an industrial innovation process, rather than the private entrepreneur. While private entrepreneurs are mostly driven by the pursuit of their own profit, a political entrepreneur has social goals, in addition to company profit, as the goal for her or his actions. A social or political entrepreneur is concerned with values

*“in the form of large-scale, transformational benefit that accrues either to a significant segment of society or to society at large (Martin and Osberg 2007:34).*

Social goals can include long-term concerns for society, and a more comprehensive view on economic activity in the country (or region or sector) that each company is too small and, hence, unwilling to internalize in their decision-making processes.

In addition, a political entrepreneur has instruments and means not possessed by the private entrepreneur. The political entrepreneur can engage himself in a business directly, in a similar manner to a private entrepreneur and act as a production entrepreneur. Additionally, however, he can make use of

interventionist or regulative measures in order to influence the economic and political framework for economic activities in ways in which innovations take place (as a regulatory or political interventionist entrepreneur). The entrepreneurial state can also be a substantial risk-taker in political as well as monetary terms. It

*“seeks to identify market opportunities ... on behalf of private actors whose pursuit of those opportunities may serve public ends” ... “aided if necessary by government as subsidizer or co-investor”). .. “The policies of the entrepreneurial state ... include generation of venture capital for selected and growing businesses” (Eisinger 1988:9).*

Some projects can be of such a character that they would never be realized, if political entrepreneurship was not exercised (as this study argues is the case of the creation of a competitive Norwegian petroleum industry).

Porter (1990:131-175) emphasizes that the forces that create the ability to innovate and consequently provide for a competitive position, function as a dynamic system. He gives political actors and public authorities an explicit role in the improvement of the factors needed to make an economic system (or the “diamond” as he calls it) competitive, and to innovate and function better. Such policy measures include first and foremost all infrastructural developments considered important for the areas where innovation may take place: roads, rail, broad band, research and development, culture, competition rules and institutions.

While Porter argues strongly against public support for individual enterprises, he opens up for support to help sectors and geographical clusters through the use of such widely defined infrastructural measures. Bureaucracy in this context should ensure that the infrastructure functions properly. A bureaucrat is in this sense however not an entrepreneur because

*“in bureaucratic organizations those in charge are obliged to conform to the rules and statutes laid down by a higher authority. The role of the bureaucrat is to execute the prescripts of the statutes and rules which severely limits his power to act as he thinks best” (Mises 1943:52).*

This study argues that the Norwegian state greatly transcended such policy limitations when creating the Norwegian petroleum industry, also with respect to the role of bureaucratic functions, cf. Chapter 2.

Ideology and visions are important for innovation and for the private and public maneuvering room of entrepreneurs. Over time, ideology and visions may change. One type of state entrepreneurship can be possible at one point in time, while it may take a different form at a later point in time, possibly also a different strength. The exercise of political entrepreneurship and its character depend on ideological acceptance, both at home and abroad.

Domestically, acceptance is important for the state if it shall act as political entrepreneur, such that it can take an active role in the economy. It is also important that bureaucrats and politicians possess, or acquire, sufficient relative political strength and industrial competence in existing or created ideological room, so that they are in a position to build institutions and regulations in collaboration with industry and associations. Also Porter (1990: 680-682), in his liberal (but active) approach to the role of public authorities, argues that governments have a role to play in shaping and promoting visions to help private and public actors work towards common goals. If public authorities do not adopt this visionary and ideological role, the whole system will be weakened and somebody else will formulate goals, such as strong private entrepreneurs, in some countries the church or others.

Scholars of international political economy (as for example Cohn 2005 and Gilpin 2001) often discuss three main types of ideology in relation to economic activity and international relations: liberalism, realism (by some called economic nationalism) and historical structuralism. These alternative perspectives demonstrate how different ideologies can lead to different policy in situations which in other respects are the same. Orthodox liberalists (e.g. classical economists) consider the role of the state to be fundamentally different to supporters of a historical structuralist perspective (e.g. Karl Marx) and a realist / economic nationalist perspective (e.g. Vladimir Putin). And yet, different from interventionist liberals (e.g. John M. Keynes). Constructivism challenges however, all of these positions by saying that preferences are not necessarily

exogenously given, as in the rationalist models, but endogenously defined depending on institutions, identities and the social environment (Wendt 1999). Under constructivism social goals can be in flux. Such ideological divisions are found in different political practices. The ability to innovate and determining which actors have the greatest potential to succeed as entrepreneurs, depends on traditions and values related to economic development, and/or the active creation of visions and ideology.

International rules and norms must also accept the chosen form of an active state policy. When international change takes place, domestic opportunities also change. The changes are related to formality (such as legal bindings through international treaties with e.g. the EU or WTO), new market structures, the positions of domestic actors, and ideology. The bureaucracy, political parties, industrial actors, trade unions, associations and others act and negotiate about how to influence domestic policy, and are influenced by international change and ideology. Hence, international change can alter the maneuvering room for the state in its desire to act as an entrepreneur; improving or making it more difficult to practice a political entrepreneurship. Accordingly, defining what national interests are can be ambiguous and change over time.

A political entrepreneur is concerned with a wide environment that defines and creates opportunities, and in particular with how institutional and political contexts are shaped in fashions that benefit state policies and programs. Schumpeter's (1934/96) five types of innovative activity<sup>6</sup> includes the political entrepreneur. It is not discussed in detail, and exists in a context in which one finds new ways of organizing economic activity, entailing

*“the emergence of a new industry or reorganization of an existing one”, “the generation and translation of organizational practices and structures”, and “seize upon recombined tools or constructs to subvert existing ways and bring about new forms of organizing” (Hwang and Powell 2004:180).*

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<sup>6</sup> Schumpeter describes five kinds of new combinations: 1. The introduction of a new good or a new quality of a good; 2. The introduction of a new method of production; 3. The opening of a new market; 4. The conquest of a new source of supply of raw materials or components; and 5. The reorganization of an industry.

Institutions, law and political practices contribute to social, political and economic change, and shifts in the environment creates or remove opportunities. A political entrepreneur not only focuses on

*“the creation of new business organizations, but also on the generation of new organizational models and policies that change the direction and flow of organizational activity. Common to these diverse activities and domains is, as for a private entrepreneur, the recognition of opportunities” (ibid:179).*

Hayek (1945) emphasized that coordination in a market is achieved through the price system. Changes in willingness or ability to supply or demand a product is signaled through continuous changes in prices. These changes create new profit or loss situations. If competition is perfect all economic profit is “competed away” in the long run, and everyone is left with only normal profit. A central task of the (private) entrepreneur is to be alert to shifts in prices and market situations (Kirzner 1999). The entrepreneurial role in a market economy is to bring about modifications and transformations in products and production methods. In this way profits can be gained and losses avoided; profits are the reward of being alert to changes and more or less temporary (potential) market imperfections that can be exploited. If an imbalance in a market can be exploited or created, the potential for earning economic profits increases (as profit beyond normal profit). Institutional and political contexts in which the products are sold must be added to the degree of market imperfections, in order to identify entrepreneurial opportunities or their lack.

For exporters, this indicates that the more imperfect other countries’ markets are, and the weaker or more incapable institutional and political regulations and contexts are of compensating for market failures, the greater the opportunities for entrepreneurship to be exercised in relation to these markets. Hence, the economic and political obstacles to full liberalization of EU natural gas markets, discussed in Chapter 5, contribute to shaping a different (and potentially larger) maneuvering room for the Norwegian state as natural gas entrepreneur. This is in contrast to full market liberalization, as discussed in Chapter 4. The need for interventionist political entrepreneurship is generally larger when markets and related politics are imperfect (compared to a neo-functionalist view, cf. Chapter

1.3), while the role of the political entrepreneur becomes more regulative when they are more perfect.

Ostrom (1990) argues that the capacity to engage in public entrepreneurship is defined by the political system. Schumpeter's (1942) conception of an entrepreneur's "creative destruction", when creating a new market arrangement that is more profitable to the entrepreneur by destroying an existing equilibrium by discovery or creation (Casson 1982), can also be used to understand how a political entrepreneur can change a political equilibrium. Riker (1986) argues that by agenda control, strategic behavior and the introduction of new policy dimensions to political debate, a political entrepreneur can break up institutionally induced and maintained equilibria, so that new and more profitable outcomes result.<sup>7</sup> The political entrepreneur resembles in this context Schumpeter's private entrepreneur:

*"both engage in creative destruction, tearing apart existing political-economic arrangements in order to create new ones" (Schneider and Teske 1992:739).*

Institutions, private and public entrepreneurs may resemble a 'punctuated equilibrium' – a process whereby institutions are characterized by long periods of stability punctuated by short bursts of rapid change (Krasner 1984). In other situations institutions can maintain a stable political outcome when forces indicate that the existing situation is in a political and/or institutional disequilibrium, as compared to what might be considered optimal when markets enter into new equilibriums (Shepsle 1979), cf. Chapter 1.5.

Hence, considered as a political entrepreneur seeking to develop a new industry, the state can be regarded as an actor that organizes and/or regulates activity in such a manner that industry succeeds in innovation, providing support to infant industry, and contributing to the development of technology and innovation. Such measures improve quality of products and services, and lower costs in a "Porterian" way of understanding how a government should act towards an industry. By such measures the state contributes to establishing the

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<sup>7</sup> The establishment of an EU Single Market for natural gas can be considered such a change creating new economic opportunities, in this case with the EU system as the political entrepreneur, cf. Chapter 4.

industry and secures its dynamic development. The role of the nation state in such markets is largely to behave as regulator, but it can on occasions adopt the role of the entrepreneur with respect to forming and interpreting regulations that defend national interests. This implies degrees of nationally styled adaptation to supranational rules and regulations, and also an increased role for the state itself when national interests are to be defended, cf. Chapter 3.5-6.

If the external political framework allows for it, a state can however go beyond this type of policy, by identifying industrial opportunities, establishing and developing industry as an interventionist entrepreneur.

*“The state increasingly function as a ‘company former’” (Shapiro 1981:29).*

The state then acts as a gründer (founder) of economic activity. Through direct ownership, control and interventionist policies, and coupling between spheres (Barth 1962), the state can more easily exercise interventionist industrial entrepreneurship, rather than pure management with the simultaneous support of more than just regulative political measures.

*“The state role is to identify, evaluate, anticipate, and even help to develop and create these markets for private producers to exploit.”...“In its role as of partner the state has become a risk-taker” (Eisinger 1988:9).*

This includes financial risks as well as the general political risk of not succeeding in developing new technologies, new markets and organizational solutions that eventually turn out to be a success. As for the private entrepreneur, without *ex post* success, the project is a failure, and often not considered an enterprise at all, with accompanying economic and political costs to the state and the individuals involved. The Norwegian state’s establishment and development of the Norwegian petroleum sector, cf. Chapter 2, this study argues to represent such an interventionist entrepreneurial role, beyond its role as a regulator of economic activities.

After a build-up period, the state has no longer the same entrepreneurial reason to directly control companies. However, other reasons to own and control them can be important in a “late” industrial phase. In the petroleum sector it can be a desire to control the industry from a democratic perspective, to secure that

long-term interests are ensured against the short-term time perspective of commercial businesses, internalize positive and negative externalities in company decisions, and performing an optimal resource management when such concerns are not easily regulated. The state can also remain a direct owner of an industry in order to collect more economic rent than results from the corporate tax system, which is partly the case in the Norwegian petroleum sector. In Norway the state therefore continues to control and develop the petroleum industry and natural gas sector, albeit market and industrial maturity and international political change have increasingly made the entrepreneurship more regulative than interventionist, cf. Chapters 2.6, 3.5-6, 4.8 and 5.6.

## **1.2 Welfare effects from economic integration**

In general, economic integration means that smaller units are amalgamated, partly or fully, into larger units. In business this could mean that a small company becomes part of a larger one. Within a country it could mean that a regional economy is integrated into a national unit. Within international trade it usually means that national economies are to some extent or in some form amalgamated with other national economies (Belassa 1961, Artis and Nixon 2001). International economic integration means that trade barriers between countries are removed or reduced in some, or in all, areas. Trade barriers can in this context comprise everything that limits the mobility of goods, services, labor, capital or resources between countries; including economic, technical, or political factors, or by nature itself. Fully integrated economies have no protection of national industries, or any direct or indirect trade barriers between themselves. Going from lower to higher levels of integration means that more obstacles to trade are removed and more policy is harmonized. As a consequence, economic integration changes the maneuvering room for national policy and businesses, although the degree and scope may vary.

Often, two main benefits emanating from economic integration are emphasized, one economic and one political. Both are central to the establishment and development of the EU. Firstly, wealth defined in economics as social surplus, in integrating economies increases. This understanding is based on liberal trade theory starting with Adam Smith (1776) and David Ricardo (1817),

and developed extensively thereafter (as demonstrated in a number of text-books in international economics, cf. the Introduction chapter). International trade removes the incentive for countries in engaging in zero-sum games with each others, as under mercantilism. This meant the benefit of one resulted in the loss of the other. International trade represents a plus-sum-game, where all countries on an aggregated level make net benefits. This is the case at least for developed countries.<sup>8</sup> Each country does not have to gain equally much, however. International trade also leads to a redistribution of, and conflict of interests about, wealth and power within a country. Furthermore, often the benefit for consumers is evident relatively quickly, while producers need more time to adjust, in order to exploit the benefits of new prices and markets. The level of benefit of the integration processes for involved parties depends on their time horizon, as well as their ability and willingness to adjust to new economic environments. Some producers will never be able, or want to adjust, and as a consequence become permanent losers;

*“globalization reduces some opportunities but opens up for others” (Tranøy and Østerud 2001a:7, my translation).*

Secondly, economic integration makes countries mutually dependent. This conception is based on interdependence theory in political science, and is caused by the division of labor through international trade. Every country makes economic gains by exporting to and importing goods and services from others, with a resultant focus on the benefit of each others' economic activity and well-being. Conflict potentials, including military ones, are dampened. Many wars in Europe and elsewhere have in part economic causes; this includes both World Wars in the 20<sup>th</sup> century. The creation of the European Coal and Steel Community (ECSC) in 1951, and later the Treaty of Rome and European Economic Community (EEC) in 1958 was strongly influenced by the desire to avoid new wars between rivals Germany and France. Classical imperialism has been heavily motivated by the colonial desire to gain resources and markets in other countries. Through trade and specialization, interdependence theorists, as well as

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<sup>8</sup> Many analysts however argue that free trade is not the prescription for developing countries seeking to improve their situation, at least not in the “short” run (Krugman 1988, Reinert 2007).

economists, argue that countries benefit instead from each other's economic activity.

Reciprocal economic dependence between economically integrated countries means that a change in income in one country will lead to an income change in the same direction in other countries; reinforcing the change in the first country. The degree of change depends on the respective countries' marginal propensity to import. The more open and small an economy is, the more the country will be influenced by the economic development of other countries. All European economies are now strongly dependent on each other, as well as on the international economic situation in general. The Norwegian petroleum sector could not for example be developed without international trade.

The characteristics and maturity of individual markets, degrees of competition and the way they are organized, as well as the influence of individual countries and companies on the market and the international system, determines who benefits most from trade. As trade leads to the redistribution of money and power within countries, it may however also contribute to conflicts between persons, sectors and regions. Domestically, increased openness in an economy is in general not a plus-sum game. In given situations this may promote rather than prevent domestic conflicts. Consequently, the political economy of international trade focuses on how prices and markets can be influenced by a branch, a region, a country or a company. Hall and Soskice (2001) discuss possible "varieties of capitalism" within interventionist liberal paradigms. They argue that more than one outcome and choice of action is possible for states and commercial market participants when entering into deeper level of integration with others, cf. Chapter 1.7. This is opposed to more orthodox liberal perceptions where outcomes and possible actions are more clearly defined by the system itself.

The distribution of benefits from integration between countries can vary a lot. The more imperfect markets are, the more important is the behavior of political, regulative and commercial participants. Social first-best solutions, as defined in economics may not be attainable, and policy choices must be selected from among several second- or third-best alternatives. In markets for non-renewable

resources this could be said to form the backdrop of a new form of energy geopolitics.<sup>9</sup> In any market, the maneuvering room for influence is greater for larger than smaller actors, but on many occasions small actors also have significant impact on outcomes of negotiations and implementation. Katzenstein (1985) argues that small countries have better opportunities of compensating those who face disadvantages and adjusting to international integration, as trade is more important for them than for larger countries.<sup>10</sup> Often more corporate and consensus oriented decision-making processes make smaller countries more capable of adjusting to change. This is an important factor when seeking to understand why the Norwegian state managed to change her NGF in a way that maintained much of its purpose in the context of the EEA agreement and a new legal regime, cf. Chapter 3.4-6.

The fact that most countries on an *aggregate* level benefit from international trade, has made it possible to build an increasingly more comprehensive international trade system, in breadth as well as in depth, in Europe and elsewhere. Integration processes are however dynamic, and may take a long time to be completed, if ever. Trade liberalization processes are often divided into two stages. Tinbergen (1954) named the removal of economic and technical trade barriers *negative* integration. Typical examples are the removal or reduction of tariffs and quotas, restrictions on the free movement of labor and capital and

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<sup>9</sup> Geopolitics is defined as the studies of the way geographical (and often also historical and social) factors help explain the power of nation states. In classical formulations the links and causal relationships between political power and (physical power over) geographic space were emphasized (Kjellen 1917). In the economically and politically integrated world of today, the term seeks to understand how control over territory influences political power and political and economic outcomes through factors, mechanisms and institutions in the international economic and political system (Agnew and Corbridge 1989). Hence, the geopolitics of any resource rich region is to be understood, not only from the area's own resource endowment. The size and location of other energy resources, how available are they, who control them, their cost, how regional and global energy markets balance, market mechanisms and regulations, political decisions, and energy prices in general, are also important.

<sup>10</sup> Using the Kaldor-Hicks efficiency criterion (Kaldor 1939), an outcome is more efficient if those that are made better off can *in theory* compensate those that are made worse off and leads to a Pareto optimal outcome. Thus, a more efficient outcome can in fact leave some people worse off. While every Pareto improvement is a Kaldor-Hicks improvement, most Kaldor-Hicks improvements are not Pareto improvements, which also reflect the greater flexibility and applicability of the Kaldor-Hicks criteria relative to the Pareto criteria. The most common criticism of the Kaldor-Hicks criterion is consequently that it only takes into account the absolute level of income, but disregards its distribution among people and sectors, and the impact on externalities.

market liberalization. *Positive* integration represents a continuation of the negative, and with stronger elements of active political interference. Positive integration implies that conditions for increased economic cooperation are being actively promoted. The concepts are however not normative – there are no positive or negative values added to them.

Negative integration is mostly created by single decisions, where agreements and legal institutions control its implementation. In the EU it consists of restricting discriminatory behavior and practices among member states. The four freedoms mainly, but not exclusively, rely on this approach. Positive integration requires on the other hand the follow-up by politicians and bureaucrats in the formulation of regulations and competition policy. Positive integration is more demanding and represents a higher level of integration. Positive integration represents a larger degree of policy harmonization between countries, and the transfer of, at least some, authority to common institutions. In the EU to a large extent it consists in the approximation of laws and standards. Negative and positive integration will often take place simultaneously and the difference between them is not always clear. The Single Act from 1986 combined for example positive and negative integration, relying upon a minimum rather than exhaustive harmonization of rules. The efforts to liberalize EU gas markets, as outlined in Chapter 4.6, can be considered both negative and positive integration.

Negative integration is often easier to implement than positive integration, as a major part of it involves removing obstacles for trade from more protectionist periods.

*“Repeated policy failures suggest that the system created by the European treaties is more suitable to the promotion of negative integration than to the development of measures of positive integration. Positive integration is often identified with positive values like social protection and the correction of market failures, negative integration with deregulation, social dumping, and the protection of economic interests. In fact, economic and other special interests may find it convenient to support measures of positive integration, while fundamental rights are often better protected by negative integration” (Majone 2005:143).*

*"Thus, the need for consensus remains very high for measures of positive integration, and when national interests are in serious conflict, Europe is unable to act at all" (Scharpf 1997:2).*

The need for consensus in positive integration is one of the constraints faced by the EU in the attempts to fully liberalize and integrate her gas markets, cf. Chapter 1.3 and Chapter 5.2.

International economic integration starts with market integration. It can be sector specific and regulate only some segments of the economy. It can also be general and include all markets. In addition to product markets and trade in services it can include or not include production factors such as labor and capital. The benefit is that increased trade in general leads to more competition, the exploitation of advantages of scale and a specialization of production. Businesses move capital from activities with low profits in one country or region, to a more productive activity in another country or region. Labor tends to move from low-wage areas and sectors to those where demand for their competence is higher, and where they can earn a higher wage. Also labor and capital must be more specialized to compete in international markets, as compared with national markets.

Consequently, integration of product markets leads to an integration of factor markets. According to the factor price equalization theorem, the equalization of relative product prices caused by international trade leads to an equalization (or more correct; convergence) of the relative reward to production factors (wages and rents), even when production factors are not freely traded. Eventually the free movement of labor and capital becomes a consequence of the free movement of products and services.

While "mainstream" economics focuses on the integration of markets, a political economy approach focuses on the economic and political integration of and implications for, mixed economies (Madsen and Plaschke 2008). The redistributive effects that follow greater trade change the roles of governments when borders are more open. In the 19<sup>th</sup> century the concerns modern welfare states display with regard to social and distributive effects of economic activity, were not very important. However, the laissez-faire market liberalism at the time

led to an unacceptable uneven social and economic distribution of benefits and disadvantages, and contributed to the break-down of the system. Today, as in the EU, everything that directly or indirectly influences the position of each country's competitive position is relevant for policy harmonization. Consequently, when integration processes take place on advanced levels, it is politically necessary to set minimum standards in a number of policy areas, to avoid ending up with a "race-to-the-bottom" in all fields that influence competition.

A country's competitiveness decides its industry's position in international markets and the country's wealth and position in the international economic hierarchy. *Ceteris paribus*, increased competition in international markets, relative to a country's economic performance, reduces its competitive position. The industry's ability to compete and innovate, as well as the country's institutions ability to interplay with the industry is important for how these relative changes evolve (Porter 1990). Accordingly, changing the international political environment relative to the domestic system will put a pressure on changing domestic politics.

Theories of international trade policy for *small* countries assume that prices and terms for competition are given by the international economic system. *Large* actors, such as big nations, multinational companies, groupings of nations, as well as certain branches and large producers of single products, may more easily influence international policies, prices and business terms. However, even small countries do have choices about how to deal with their marginal position in international markets. Imperfect information and imperfect markets, and differentiated products and services (due to monopolistic competition, intra-industry trade etc) give maneuvering room. Even though small countries depend more on the international economy than big countries, and are often more limited in their domestic policy formulation than the big ones, they can nevertheless make alliances with other countries, intervene and support certain industries, even though the WTO and EU systems limit the possibilities and changes the character of opportunities. In the same way as domestic groups and political parties exercise influence over domestic policies, single countries and alliances of countries can exercise an influence at the international level. Transnational

alliances on both industrial and political levels have for example, been important in the development and maintenance of the NGF, cf. Chapter 2.3 and 4.1.

Policies influencing competition in national markets have however become more similar and prices of products (and production factors) have tended to converge with a more liberal international trade system. The array of domestic policy alternatives have become fewer as a result, depending on the scope and depth of integration processes and the measures taken by individual actors. Single countries and industries may be clever in avoiding and delaying the negative effects of free trade (mostly for import competing industries). Industries and associations may influence state policy and international rules for their own benefit. Many economies, not least in Asia, has over the past decades actively adjusted to prices and competition rules in international markets, while at the same time protected themselves as much as possible at home and sought influence over international rules (Scott 1986, Porter 1990). As demonstrated in strategic trade theory (Krugman 1988, Oliva I Armengol and Rivera-Batiz 2001, Reimer and Stiegert 2006) they apply an interventionist attitude to a liberal economic system; in some cases it also can be considered a realist approach (“economic nationalism”). This also parallels largely the attitude of the Norwegian state when developing her natural gas entrepreneurship (cf. Chapter 2) and later defended it when adapting to the EEA agreement (cf. Chapter 3).

The competing interests and mechanisms balancing economic efficiency, fair distribution of income and political autonomy often lead to stagnation or even reversal of processes, after a period of substantial reform and deeper integration. During history liberal ideas have varied in attractiveness depending on how and how fast benefits and costs have been distributed within and among countries. However, as industrial structures change, resources reallocated geographically and across industries, the cost of permanent disintegration becomes costly. To date there have not been seen examples of countries that have permanently been able to exclude themselves from the surrounding economic world. Countries that have tried this have experienced much lower economic standards than countries with greater free trade, with a following disintegration of the country itself (Soviet Union, Albania etc). When European countries tried to attain a higher degree of self-sufficiency after World War I (WWI), the result was eventually

tremendous unemployment, inflation and economic recession, and breakdown of the political system.

In sum, the complex interdependence that Norway entered into with the EU from the 1990s, in legal terms through the EEA agreement (cf. Chapter 3.1), may have many different forms and outcomes depending on intra-EU developments, as well as on Norwegian interpretation and adaptation. Principles for non-discriminatory behavior and reciprocity are clear, but situations and their practical implementation and understanding may vary. The maneuvering room and policy option for exercising a national policy domestically as well as towards other countries has changed, but the outcome of the processes is also not always clear. For the political entrepreneur, it depends in part on the relative innovative ability to change policy to (continue to) defend important defined national goals within new sets of rules and regulations.

### **1.3 Integration levels and theories**

From an economic point of view, countries engage voluntarily in deeper levels of economic integration because they gain net economic benefits. In addition to political liberalization of international trade, globally as well as on the European level, technological progress in communication and transportation have played important roles in trade liberalization. The exploitation and creation of comparative advantages, competition, economies of scale and product differentiation are main reasons for economic gains. The effects are lower costs, better quality and more diversified products and services. The resulting specialization in production structures increases the return to international, as compared to more sheltered, national economic activity. Growing economies are today typically “outward”, or export, oriented. Engagement in international trade results in production of fewer types of goods and services within each country, while the number of goods and services consumed is expanded. The imbalance is solved through trade.

Agreements about trade liberalization and other de facto economic integration steps have reduced each nation’s freedom to choose policies independently of other states. The functioning of the international system, in

terms of decision-making, as well as markets, is increasingly more important in the formulation of national policies. National independence to formulate policies based on domestic preferences alone is balanced against and changed in favor of the benefits of doing trade in larger markets in order to achieve higher economic standards of living.

The international agreements made with and within institutions like the WTO and the EU, are however negotiated by countries and groups of countries and colored by their preferences and situations. Almost no market is actually “free and perfect”, and market regulations influence prices and competition rules both in international and domestic markets. The nation state, to a large extent, implements agreements made bi- or multilaterally with other countries, and is often pressured by domestic groups to do this in a beneficial manner for those affected. However, if the interpretation goes too far in favor, or at the cost, of specific domestic groups, the case can be sent to a supranational level, such as the WTO dispute board or ESA and the EFTA court. A government must therefore deal with both regional and international institutions, with the goal of making policies operational and decisions institutionalized in both a realistic and optimal manner. In many cases, a situation does not open for any significant degree of freedom of independent action. On the other hand, in other situations the maneuvering room can be significant.

Haas (1958) sets out a liberal *neo-functional* theory of regional and EU integration, supporting the idea that lower levels of integration lead to higher levels and more comprehensive common or harmonized policies across member states. Haas argues that initial decisions to place certain sectors under the authority of central institutions (in particular the Commission), create pressure to extend their authority into neighboring areas of policy. Sectorial integration promotes integration in other issue areas. Bache and George (2006) argue that political spillovers create additional pressure, where both the Commission and sub-national actors seek more integration. The self interests of the Commission and sub-national actors bypass national interests, creating their own dynamisms and loyalties apart from national interests (as defined). Neo-functionalists argue that sectorial integration and political spillovers form a self-sustained integration

process and the creation of a new political entity with its centre in Brussels. Thus, argued, economic integration leads to political integration.

The “Community method” of policy-making promoting these processes was conditioned on the behavior of an entrepreneurial Commission, and the behavior and expectation that participants in the process would reach common goals. The method was of a consensus type, formally or de facto sacrificing qualified majority voting (QMV). This type of process was especially important and symbolically significant when member states and the Commission met to realize the customs union and the Common Agricultural Policy (CAP) in the early years after the establishment of the EEC in 1958 (ibid, Webb 1977:14-15).

The impacts on domestic policy from economic integration processes, and its institutional and organizational effects, differ however with integration level. For sectorial interests, it is not only the general level of integration that is important, but also whether or not the processes allow for special treatment of the specific sector in particular, and whether or not there is room for negotiating exceptions and the special treatment of national positions and interests. The principles for such sector specific treatment are important, for example whether general competition principles are applied, or the specifics of the single sector are emphasized. The degree of regulatory power of the EU versus the nation state is also important. The development may not necessarily be uniform across the Union. Neither countries nor specific markets need to necessarily integrate with the same scope and speed. The obstacles for the EU with respect to completely liberalizing her natural gas markets, discussed in Chapter 5, represent an example of the question of uniform or individual design of market liberalization in this study; should the EU aim at creating a Single market for natural gas, based upon an individual design attributed to its particularities, rather than following general competition principles in a straightforward manner similar for all countries, as outlined in Chapter 4.3?

When economic integration over time leads to more comprehensive common or harmonized policies across participating states, in accordance with the neo-functional approach, supranational regulations become gradually more important. The discussion below describes a general hierarchy between the

totally closed economy (an autarchy) and a complete merging of countries (a federation) with following policy harmonization, cf. Figure 1.1 (Austvik 1994). For each level described, the logic of a move to a next deeper level of integration is discussed.

Figure 1.1: Levels of economic and political integration

Type of integration:		Negative				Positive			
Policy area	No trade	Free float of goods and services	Common external tariffs	Free float of production factors (labour / capital)	Harmonization of policies influencing competition	Common or coordinated fiscal policy	Common or coordinated monetary policy	Common foreign and security policy	Common government
Integration level									
<b>Autarky</b>	X								
<b>Free trade area</b>		X							
<b>Customs union</b>		X	X						
<b>Common market</b>		X	X	X	X				
<b>Economic union</b>		X	X	X	X	X			
<b>Monetary union</b>		X	X	X	X	X	X		
<b>Political union</b>		X	X	X	X	X	X	X	
<b>Federation</b>		X	X	X	X	X	X	X	X

\* Examples: VAT, excise taxes, (usually minimum taxes), competition rules, product specifications, social policy, harmonization of education, environmental standards, public purchases, regulation of labor standards, regional policy etc

*Autarchy* is a situation, which in its extreme precludes all economic cooperation with other countries. Economically this implies self-sufficiency and no trade with the outside world. No country has perhaps ever been a pure autarchy. However, at present, North Korea has as a goal of being as self-sufficient as possible. In Europe, Albania had such a policy until the regime fell in 1991. Most countries possess at least some degree of openness in their economies, through bi- or multilateral trade agreements.

In a *free trade area (FTA)*, trade barriers such as tariffs and quotas, on some or many goods and services, are reduced or eliminated between countries. Consumers can buy products from the most competitive supplier in the area. A major problem with a free trade area is trade deflection. In a free trade area each

country sets their own trade policy against non-member countries (third parties). Consequently, if country A has free trade on a product with B, and B has a lower tariff on this product towards the rest of the world than A, importers in, and exporters to A would benefit from importing the product first to B and then take it into A. In order to make this import pay the higher customs in A, products taken into B need a certificate for the country of origin to be shown at the border between B and A, so that the right tariff can be calculated. That means that customs control between member countries must be maintained in free trade areas, even if the countries abolish all trade barriers between themselves. The exception is when external tariffs are much the same for participating countries (which is the case for the EU and Norway for most products covered by the EEA agreement).

EFTA is an example of a free trade area. The main content of the cooperation within the WTO is also characterized as a free trade area, where tariffs and other trade barriers have been dramatically reduced over the past decades. The principle is that all member states are to be treated equally across the organization. The Most Favored Nation (MFN) clause in the WTO says for example that the benefit one country gives to another country, should also be given to all other member states. The reciprocity clause requires that the beneficial treatment a country receives from another, should be given by the country itself to other members.

A *custom union* is a free trade area that has also established a common external trade policy (common external tariffs). A customs union removes the problem of country of origin certificates. Products taken into one country can freely be moved to another. Even though the original EEC was called a common market from the outset in 1958, it started out largely as a customs union (except for the CAP), and even this was not fully established for 10 years in 1968.

The removal of tariffs and quotas can be relatively simple in a customs union. However, as a replacement for these, a number of non-tariff barriers can be introduced by member countries, such as subsidies, bureaucratic decision-making, public procurement's favoring national industries etc. ("hidden" trade barriers). This is what leads to the need to harmonize domestic policy areas that

directly and indirectly function as trade barriers and hence, improve the competitive position of national businesses.

Such harmonization is undertaken in a *common market*, where markets for products and production factors operate as one. Common policy within the areas that influence competition must be established. This can include the harmonization of Value Added Taxes (VAT) and excise taxes, competition rules, product specifications, social conditions, educational and environmental standards, rules for public procurement, reduction or elimination of border control, harmonization of financial services, communication etc. In order to prevent countries from a political race-to-the-bottom, and the practice of social or environmental dumping, loss of revenues etc, minimum level standards on policy must be set.

The EU Single Market is an example of a common market with many of these characteristics. By joining the Single Market in 1994, Norway moved from being only part of the free trade area of EFTA, to also becoming an economic participant in this common market (and a political follower of the EU). With the EEA agreement, Norway has however not joined the customs union, and hence has not adopted common external tariffs with the EU. Consequently, Norway makes her own negotiations with the WTO, in line with the EU representing her whole group of member states. However, Norway must through the EEA agreement adapt to EU directives on market regulations and EU competition law (cf. Chapter 3), and is influenced by all other EU policies relevant to the role of a natural gas exporter (Chapter 4 and 5).

As it is difficult for open economies to perform macroeconomic stimulation policy alone, because it leads to significant import leakages, it is necessary to coordinate or establish a common policy capable of securing an overall balance between supply and demand in the economies that share the common market. The consequence of establishing a common market may be that an *economic union*

is established.<sup>11</sup> An economic union will include part or full harmonization of member states' fiscal policy.

As an alternative to fiscal policy, monetary policy might be used to regulate economic activity. In a *monetary union*, member states can peg their currencies to each other, or introduce a common currency, such as large parts of the EU has done with the euro. This leads to a single level of interest rates across euro countries. A monetary union can be introduced as part of, before, or after the establishment of an economic union. A common currency requires however, a great degree of harmonization of fiscal policy because exchange rates are influenced by the underlying economic situation in a country. A common currency requires a common central bank and the development of a common monetary policy. The economic union should therefore, be introduced before the monetary union, which is by no means fully the case for the euro countries. The microeconomic goals for a monetary union are to reduce costs and uncertainty resulting from fluctuations in exchange rates, eliminate currency speculation between member states, and to lower transaction cost for the movement of capital across borders.

Gradually, foreign and security policy also becomes part of what was originally an economic integration process. The group of countries gradually share so many economic and political interests that there is a need to act together in more fields towards the outside world. Elements of a *political union* evolve, where a common foreign and security policy becomes part of the political agenda. In the case of the EU, the coordination of police work through the Schengen agreement is another example of political union.

Hence, over time, at advanced levels of integration countries must have common rules for trade and competition, common trade policy and elements of coordination or, a common, fiscal and/or monetary policy in order to make trade "fair" and industrial policy work. A prerequisite for all levels of integration are that solutions are in place about how disputes concerning understanding and

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<sup>11</sup> In the literature there are some variations in the use of the denomination of higher levels of integration, such as common market and economic union, and the order in which they need to be introduced (Molle 2006, Pelkmans 2006).

implementation of treaties are to be resolved. The higher the level of integration, and the deeper it goes, the greater the formal limitations are put on national policy. National policy must be partly harmonized with other countries, and partly authority must be transferred to common institutions. The closer the cooperation, the more competence is required from these institutions. For the Norwegian – EU relationship, ESA and the EFTA court shall fulfill such roles.

An economic and political union includes a substantial degree of merging of member state economies, coordination of or a common macroeconomic policy, and elements of a political union. This result in a confederation, since member states governments retains their sovereignty. The Maastricht Treaty from 1991 decided that the EU should be an economic and political union, and confirms the confederal structure of the Union. But in that Treaty, elements of the Single Market and later efforts, such as the proposal for a new constitution, also represent elements of and proposals for supranational and federal aspects of the union.

Eventually, what initially started (only) as economic cooperation might develop into a federation with a common government for all member states. Such a federal government would have responsibility for all persons and production activities in what then will be 'states' within the federation (as in the U.S. and Canada). These states can however, have a substantial degree of autonomy, and it might also imply some decentralization of authority within defined areas.

However, the dynamism discussed above does not mean that EU integration processes eventually *must* lead the EU into a federation. President Charles de Gaulle insisted already in 1965 on the importance of state sovereignty, and against the procedural code of the Community method. Furthermore, with the rise in the number of non-tariff barriers in the 1970s and the creation of the European Council (EC) in 1974, *inter-governmental* aspects of the Community were strengthened. Heads of states and national ministries met in the EC, and together with the Committee of Permanent Representatives (Coreper) they formed an intergovernmental system of member-state representatives, with crucial preparation for and decision-making authority resting with the Council of Ministers. Intergovernmental theorists, beginning with Hoffmann (1966) and

followed by political scientists such as Taylor (1983) and historians, such as Milward and Lynch (1993) and Milward (2000), have claimed that neo-functionalists underestimate the resilience of the nation-state, and that these states resist the gradual transfer of supranational authority to EU institutions. The bargaining and consensus-building techniques of the Community method were instead considered to be refinements of intergovernmental diplomacy, rather than the ultimate transfer of power to supranational EU institutions (Webb 1977:18).

In the political science literature there are modifications and additions to the neo-functionalist and inter-governmental approaches to understanding EU developments. Moravcsik (1993a, 1998) argues that national governments form preferences in accordance with liberal (economic) theory, in interaction between domestic economic interests, parties and institutions. These preferences are brought to the bargaining table in the EU where they are met by other countries' preferences and political powers, and the Commission is taking a minor role. This contrasts with the neo-functionalist perspective that considers the role of the Commission and common EU interests as more important. Liberal intergovernmentalists emphasize the bargaining process and power asymmetries between member states, and consider

*“package deals and ‘side payments’ as determinants of intergovernmental bargains on the most important EU decisions” (Pollack 2005:18).*

Member states back specific institutions to provide credible commitments for member governments. Moravcsik (1993a:490) argues that EU processes have primarily been driven by a

*“gradual process of preference convergence among the most powerful member states, which then struck bargains among themselves”.*

Actors are by this approach assumed to be rational, where they fix economic and political preferences domestically, and act to reach their goals within the maneuvering room posed by the institutions and regulations created.

While Moravcsik's analysis considers the functioning of institutions to a large degree to be the result of intergovernmental bargaining, other analysts, such as

March and Olsen (1984, 1989), add that institutions themselves do matter in the study of integration processes. Institutions could lead to lock-ins, as well as provide path-dependent behavior among actors. Keohane and Milner (1996:20) argue that

*“pre-existing institutions allow actors to resist the pressures generated by internationalization”.*

Different integration levels require over time however, different institutions and organizational solutions depending on how advanced they are, and how far the processes have progressed. Some of these changes are general effects from integration and some are connected with adjustments in specific sectors.

While neo-liberal institutionalists accepted the liberal intergovernmentalists' assumption of instrumental rationality, and a notion of (fixed) preferences based on a rather narrow definition of self-interest, constructivists have challenged this assumption:

*“human agents do not exist independently from their social environment and its collectively shared systems of meanings (‘culture’ in a broad sense)” (Risse 2004:161).*

In addition to understanding institutions in terms of formal rules, they can also be understood by considering how they form informal rules and norms, which shape actors' identities and preferences, constructivists argue. Preferences are as a consequence, not necessarily exogenously given, as in rationalist models, but endogenously defined depending on institutions, identities and the social environment.

*“The logic of consequentiality is replaced by the logic of appropriateness” (March and Olsen 1989:160).*

Or differently stated: In the “rational” approach of the intergovernmentalist and institutionalist schools of thought, interests and preferences are assumed to be fixed and above empirical questioning. In constructivist schools of thought, preferences becomes an empirical question and, depending on the research question, an explanatory variable shedding light on political action and

negotiating outcomes, and a dependent variable explained by constituting frameworks (e.g. “identity”).

The neo-functionalist / intergovernmentalist debates in EU studies are respectively challenged by the institutionalists and constructivists. They partly contradict and partly support each others views on the progress of EU integration processes. Neo-functionalists and constructivists point to the potential for further integration: neo-functionalists through functional and political spillovers, constructivists through changes in identities and preferences resulting from cooperation over time. Institutionalists and intergovernmentalists are more skeptical to both spillovers and socialization. For them institutional and policy integration is unlikely to change in the foreseeable future (Moravcsik 2001:163), and policy will continue to be defined by inter-state processes. These diverging views on EU policy making are of particular importance when discussing to what extent the EU or EU member countries will make natural gas policy within the Community, cf. Chapter 5.2, and the discussion about positive integration in Chapter 1.2.

For the political entrepreneur it is important to note from the above discussion that in some cases the formality of an agreement is more important than how a country actually adapt to it. In some situations a nation state has an opportunity to innovate with respect to regulations in order to make it comply with the agreement, while at the same time revising domestic policy in pursuit of reaching important national goals. Considering the EU a “weak” state structure resulting from intergovernmental bargaining opens a greater maneuvering room for a national political entrepreneur, than if the EU is considered a “strong” state structure in which everyone must follow a powerful (and entrepreneurial) EU Commission, cf. Chapter 3.5-6, Chapter 6.1 and Chapter 6.3-4.

#### **1.4 The dynamics of economic integration processes**

A static description of welfare effects of trade is useful when it comes to understanding the goals of economic integration processes, cf. Chapter 1.2 and as shown in theory for international trade and trade policy. Most countries however, seek instead an optimal rather than maximal degree of openness in their

economies. National interests concerning degrees of autonomy and sovereignty, conflicting interests between and within countries, and inertia in markets and politics often contribute to a slowing down of integration processes. In some areas (for example in agricultural products) complete global free trade may never become a reality.

Hence, a dynamic understanding of integration processes is necessary, *in addition* to a static one. Then, economic integration becomes the process whereby direct and indirect trade barriers are dismantled, and one, more or all parts of the economies gradually create larger, or common, units. The forming of these gradually more common rooms can be heavily influenced by inter-governmental bargaining.

As with innovation processes in entrepreneurial activities, policy coordination in economic integration processes may take place incrementally, but is sometimes discrete or radical. The most cautious approach to harmonizing policy with other countries is to inform partners about political goals and the plans proposed for reaching them. Such information reduces elements of surprise and misunderstandings, and it opens for a consistent and comprehensive policy among parties. The country retains full sovereignty over national policy. Such information activity is undertaken on a daily basis through diplomacy and international organizations.

A higher level of cooperation takes place when countries start coordinating policy. This can include the harmonization of national laws and regulations. Each country retains sovereignty in deciding over national policy, but the active coordination with other countries reduces the freedom of action, even if there are no sanctioning arrangements in place for dealing with disputes.

If national policy measures become common, either through treaties that bind policy or through a supranational authority, the formal national freedom of action disappears. Such a situation requires supranational institutions of control, such as the dispute resolution organ within the WTO, the EU Commission / ESA for the Single Market and the EC / EFTA Court for appeals. The EU economic and monetary union presupposes the transfer of authority to common

institutions. This has in particular been seen with the establishment of the European Central Bank (ECB).

Most agreements about economic cooperation are however based on the principle that decisions should be taken at the lowest possible political level, but high enough to be effective (principle of subsidiarity). If a regional authority is not able to handle a case, the task can be offered to a national authority. In the last instance it will be handled by the international organ the parties have agreed upon to deal with disputes. The higher the level of integration, the more areas will be affected by the bi- or multilateral regulations. Over time, authority is gradually moved from regional and national authority to the international level, in order to harmonize rules and laws across countries.

At the same time as the pressure for more supra-national institutions takes place, new economic regions may evolve, within and across national borders. New cross-border regions can be given authority that previously was executed by a nation state. The transfer of power from nation states to international organs, and the harmonization of competition rules through political decision-making and market pressure, may consequently strengthen regional institutions (Veggeland 2000:42-82). If national governments are no longer able to decide on regional matters, the implication is that (relevant) regions should strengthen their ability to take decisions themselves. This is an important reason for why regions tend to become fewer and more politically competent. For example, Norwegian regions may more easily discuss relevant affairs with neighboring regions in Sweden, and more easily defend their interests than when the national government aims to do it for them. This will lead to a closer proximity to decision makers in some cases, in spite of the transfer of power from the national to the international level in other areas.

The dynamics of economic integration processes indicate that lower level of integration pushes for higher levels, cf. Chapter 1.3 above. Trading countries must over time become more similar in their policy if free trade is to work. The processes must not, and over time will not, however continue in a linear way. For example, in a situation with substantial unemployment and low or negative economic growth, countries can be tempted to find ways of protecting industries

from foreign competition. The solution could be creative non-tariffs and hidden barriers against imports, rather than to furthering deeper into integration with others.

Restricting trade too much over time is however difficult. Because the import of one country is the export (and employment) of another, protectionist policy aggravates everyone's problems. The result in the inter-war period was huge unemployment, inflation and economic depression. Policies were dominated by competing devaluations and protectionist measures. After World War II (WWII) plan economies of the Soviet era and Eastern Europe were also based on a large degree of self-sufficiency. Over time, the result was an economic situation that increasingly lagged behind the West, and contributed to the collapse of the system in 1991.

Greater integration would speed up growth in a period of recession, but also reinforce the speed of structural change, as reviewed in OECD (2005). The challenge for an integration process is to prevent unemployment in non-competitive sectors from growing too much when processes are going fast. This can be done by macroeconomic stimulation policies. In such a situation not only long- and short-term interests are confronted but also winners and losers from trade liberalization. Integration processes *should* as a consequence take time, in order to give people, businesses and society time to adjust. The "rich" world has actually given itself half a century after WWII to adjust, while new market economies and developing countries are pressured for much faster adjustments.

Within single sectors however, all countries try to reap the benefit of trade in general, and avoid the sector problems it creates to the disadvantage of the other country, being exporter or importer. In strategic trade theory the orthodox liberal understanding of the benefits of trade is replaced by a more interventionist liberal approach, sometimes colored by realist / economic nationalist attitudes. A strategy of mixed blessing is however limited. In international trade negotiations the country's (economic) benefit of increasing exports is weighed against the (political) cost of increasing imports. In this way exporting and importing sectors within a country are put up against each other (such as exporting fish farming measured against import competing agricultural interests in Norway). However,

within limits it remains in many situations an option for most countries to adopt an interventionist attitude to trade liberalism.

To illustrate the general point of how different sectors are pitched against each other in an integration process we study a negotiating situation between country A and B, cf. Figure 1.2. The game is simplified by the assumption that both countries have only two alternative strategies for policy; free trade or restricting trade. The free trade option represents a policy that removes the possibility of politically influencing exports or imports in an individual manner. The restrictive trade option represents a policy where the possibility of intervening politically, in terms of restricting or changing the terms for imports, is maintained. This can also be thought of as actively influencing the exports of a country.

We assume that both countries are able to calculate the benefits and costs of policy outcomes. *If* A and B were sure that the other's choice was made independently of their own, both would act unilaterally according to how national interests are defined and choose a restrictive trade strategy. This is illustrated in the lower right box. In this case the benefit of international trade is not exploited. The reason for the choice is that the situation would be worse for both if a free trade strategy was chosen when the other chose the opposite. This is illustrated in the upper right box for B (-2, +4) and the lower left box for A (+4, -2). If A gives up her national policy while letting B continue to possess its policy she would loose, while it would be the best possible situation for B (and vice versa).

Figure 1.2: The political economy of an economic integration process

		Country A	
		Free Trade	Restricting trade
Country B	Free Trade	+2, +2 (4)	-2, +4 (2)
	Restricting trade	+4, -2 (2)	-1, -1 (-2)

Developed from Krugman and Obstfeld 2006: 224-225

Restricting trade would be the dominant strategy for both because it yields the best result independently of what the other does (a Nash equilibrium). For example, by choosing to restrict trade the outcome for A would be +4 if B chose free trade and -1 if B chose to restrict trade. These results are both better than to choose free trade, as it would yield +2 if B also chose free trade and -2 if B chose to restrict trade. This is a situation similar to the "Prisoner's dilemma" (see for example Schelling 1978:216-220) and might in this instance be called a Negotiator's dilemma. Both countries end up worse than if they cooperate. If both choose to restrict trade, a "trade war" between country A and country B (-1, -1) would be the result.

However, country A and country B know that the upper left box is better for both (+2, +2) than the lower right box (-1, -1) yielding a *total* surplus of +4 versus -2 (combined surplus for A and B is indicated by the numbers in the circles in each box). It follows from trade theory that A and B would be best served if both chose free trade rather than to restrict trade. To reach to the upper left box the two must negotiate a strategy that ensures that the other will not go for restricting trade, if they choose free trade themselves. Both benefit by limiting their own political maneuvering room, if they can be certain that the other will do the same. This

will not be the first-best solution for the two countries, as their interests are defined economically (which would be +4), but nevertheless the best that can be achieved (+2). A trade agreement that limits protectionist policy in both countries can solve the problem, and they can both move towards the upper left box (+2, +2). Country A will gain more if country B chooses to waive its nationally defined policy, than she will lose by waiving her own.

However, within this general framework each country wants to optimize, formulate and promote sectorial policies. The struggle between open and restrictive trade may continue on more modest levels, also after an agreement has been signed. The best strategy for A would be to sign a general agreement with B and then perform a nationally defined sectorial policy whenever possible. In this way she could be a partly free rider on the other. The country would receive the benefit of market access for and political influence over her industry, without experiencing reciprocity from the other. This can be achieved by “hidden” measures and “clever” adaptation to agreed rules. This makes hidden and indirect barriers to trade, that by implication help export and import competing industries, among the most important issues discussed in present trade talks. The game between Norway and the EU when adapting her gas model to the gas directive and EU competition law, presented in Chapter 3.3, represent an illustration of such processes. The de facto Norwegian adaptation to the EEA agreement, discussed in Chapter 3.5-6, the intra-EU debates to define and interpret the borderlines between national and EU policy in Chapter 5.2, and the interplay between a regulator and the regulated in Chapter 5.5, represent empirical examples in this study where such struggles are important.

In an overall economic judgment in the context of this discussion, it makes sense for Norway to join the Single Market, either as an EU member, through the EEA agreement or, as in the case of Switzerland, through a bilateral trade agreement. In specific sectors the interest expressed by some parties in maintaining a nationally defined policy does however not disappear with such agreements; most clearly for Norway in the case of natural gas. The maneuvering room for independently defined policy is however changed both for the EU and for Norway, when an agreement is in place that has the intention of bringing both to the upper left box in Figure 1.2. Policy must be re-made within the framework

of the agreement, i.e. influencing competition rules, specific sector arrangements and other issues. Equally important are ways of commercially and politically adapting to the new situation in such a manner that it benefits nationally defined interests.

Both Norway and the EU should according to an interventionist liberal perspective position themselves favor free trade in general. But at the same time they will seek to formulate (in parts) a policy as independent as possible for sectorial and revenue interests through measures and actions which won't ruin the overall deal. Norway and EU share many economic interests, but there can also be elements of conflicting interests, such as for example the distribution of profits, taxation and production profiles for natural gas. For Norway, the passive character of the EEA agreement gives the EU a greater influence in creating a maneuvering room for policy making. This is beneficial primarily for her and her member countries compared to Norway and her interests. Norway is to a large extent left with defining and implementing policy made by the EU. Because of the imbalance in political power in favor of the EU, Norway may have to modify its ambitions concerning influence over her economic activities.

The ability of nation-states to reach their goals, despite the loss of sovereignty that the integration process entails, is however important for the balance of dependency (Cooper 1968). The response of states to this loss can be passive or even defensive, aggressive and exploitative, or constructive and cooperative. From a liberal perspective, cooperation is the best response to interdependence and achieving win-win solutions. However, in spite of being small, small states can achieve objectives in dispute with larger states because they often benefit from a "complex interdependence", where societies are connected in multiple ways and the hierarchy of issues is absent or weak (Keohane and Nye 1977:24-29). From a more realist perspective the less dependent actor (often a larger country) will however not only let market transactions passively dictate their interdependence with the smaller state, and demand change of terms of operations or "side payments". For the small country, in such a situation interdependence may turn into something closer to one-sided dependence.

On the other hand, Katzenstein's (1985) argument, that small countries more easily adjust to changes because it is easier for them to reach consensus oriented decisions in corporate domestic structures, indicates that the small country could potentially be more dynamic than the bigger in decision-making. The EU system, for example, must continuously compromise interests across countries, and this may delay and weaken decisions, cf. Chapter 5.2. In spite of the obvious power imbalances between the EU and Norway, policy outcomes as a consequence depend on more than just the formal, economic and political "meat weights", as demonstrated in the Norwegian adaptation to the EEA agreement in the case of natural gas, cf. Chapter 3.

## 1.5 Exogenous change and domestic policy change

Exogenous change in relevant external and domestic factors challenges and may change domestic policy making and a political entrepreneurship. Realists often assume states to be unitary rational actors and that they are the only entities acting in relation to other states. National policies towards other countries and the international system are founded as a "Second Image" of domestic affairs (Waltz 1959).<sup>12</sup> Interdependence theorists maintain on the other hand that international relations have expanded beyond the international sphere, and far into domestic affairs (Keohane and Nye 1977). Therefore, domestic institutions and politics will contribute to shape international relations directly, or through the (re) formulation of state policy. Although policies towards another country's government are in the final instance set by national governments, persons, companies, institutions and interest groups within a country also exert an influence. "Second Image Reversed" arguments emphasize on the other hand, the impact of the international system on domestic affairs (Gourevitch 1978). The international economy often affects national policy by acting upon domestic actors, which in turn affect the domestic political system through associations, state structure and ideology. The reversal of the "Second Image" stresses impacts

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<sup>12</sup> Waltz divides theories on the causes of war into three categories: The first image, or cause of war, refers to the evil nature of certain men or of mankind. The second image blames the nature of individual states. The third image concerns the nature of the international system in which states interact.

on domestic policy and the distribution of economic activity, wealth and market power resulting from participation in the international economy, as well as the distribution of (military) power between states.

The point is that change in domestic policy can arise not only from changes within the country, but also from exogenous change abroad and changes in the cost and/or rewards accruing from international economic change. The exogenous change can result from a reduction (or increase) of technical, economic and political barriers to the international movement of products or production factors. Alternatively, an exogenous change can give rise to production processes or endowments (of for example discovery of huge petroleum resources) that increase (or decrease) the profits from doing international business in general, or from entering into specific products and service activities.

Changes in such variables for domestic policy makers represent exogenous variables in the analysis. Frieden and Rugowski (1996:28) summarize the endogenous (or dependent) variables in this type of analysis as:

*“The policy preferences of relevant socioeconomic and political agents within countries towards national policies and national policy-making institutions;*

*Given these preferences, the adoption or evolution of national policies and of national policy institutions;*

*Given preferences, politics and institutions, the relationship between a given set of institutions and a given set of policies. “*

Gourevitch (1986:54-66) lists four main domestic factors that in interplay with the international sphere are capable of explaining the following: the formation of state policy, the production profile, intermediate associations, state structure and economic ideology.

The *production profile* represents interests within society with respect to economic activity. It concentrates on the preferences of social actors as they are shaped by their situation in economic activity, sectors, branches, regions etc. Preferences may change when the international economy and trade changes the relative reward of competing economic activities. These interests can largely be identified by liberal economic theory.

If however politics are reduced to the battle of social (economic) preferences, one can overlook the process and question of how preferences through power become policy. The actors apply pressure on governments for particular policies through *intermediate associations* such as political parties and lobby groups, trade unions, public debate etc. in order to attain their goals. Intermediate associations, transferring preferences into policies, link social preferences, as identified in the production profile, to state institutions. However, such organizations often have their own identity and can be rather autonomous from the individuals, groups or forces they represent. Linkages between interest groups and parties, degree of centralization and corporate structures are particularly important in determining how associations work. Consequently, a change in preferences does not automatically change the policy of intermediate institutions as outlined in neo-functional theory.

In order to assess the effectiveness of intermediate associations in reaching policy objectives, one must study their connection with governmental institutions, such as the state. *State structure* represents the role of formal institutions, state bureaucracies and rules in mediating interests, and in defining both interests and intermediate associations. The state and its institutions, often in interaction with the associations that represent economic and social actors, make policy. At times, however, the bureaucracy can turn directly to economic and social actors and bypass associations, and vice versa. *Ceteris paribus*, state policy can be considered endogenous *if* state institutions do not possess their own preferences. If however it has its own preferences, state policy must be considered exogenous and not necessarily change when social preferences and/or institutional change occurs. The impact of state structure on policy making seems most clear if one holds social actors and associations 'constant'. If this is the case, different institutions and rules for governing will also yield different political outcomes. Similarly, a different set of associations and social actor preferences will yield a different policy from the state in a given state structure.

*"In the history of Norwegian administration, affiliation with the professions has been important. Even if political loyalty is a highly rewarded quality, the professionals in the administration must, on a day-to-day basis, balance political loyalty against*

*neutrality and professional autonomy” (Christensen, Læg Reid and Zuna 2001:96-97, my translation).*

Governments may respond to changed preferences positively and directly, but governments may also have other concerns. An important one is to retain office; concurrently, another is to redistribute wealth in favor of government core political constituencies; a third is to have control over an expanding social pie; a fourth is to further ideological goals. Aggregate economic performance and political power may become secondary to the government’s concern over distributional effects. It may be impossible to take full account of concerns over what is best for a nation’s macroeconomic interests in the long run. Instead, a government might distribute benefits to the groups that brought or keep them in power, even at a high macroeconomic cost.

As a consequence governments might respond to the international system, and domestic actors’ preferences might change dependent on formal political institutions and polity. We take three general points from Garret and Lange (1996:53-54). Firstly, the more institutions privilege groups that form the core base of support for incumbent governments, the stronger the incentives to maintain policies and institutions, even if these are declining in market power. For example, in many countries, rural and agricultural interests are ‘over-represented’ in the political system, compared to their economic importance and population. Secondly, the more complicated “acceptance procedures” are for the government, the lower the responsiveness of policy and institutional change to a given change in societal preferences. Thirdly, the more authority over policy rests in the hands of independent bureaucratic agencies, the less policy and institutional change should be expected.

*Economic ideology* expresses the role of perceptions, models and values in how the economic situation is perceived and the political circumstance, which influence preferences and behavior. These perceptions are colored by ideology, which shape calculations of the costs and benefits of a particular policy, as well as its opportunities and disadvantages. Such ideology may exist among political and economic elites, but also in the population as a whole. Policy outcome also depends on national traditions and values concerning the economy. Cognitive

components can therefore exert an influence on decision-making. A change in ideology, among elites or in the public, will lead to a change in the weighting of preferences and the behavior of institutions and the state structure. Most political parties and the Norwegian public in general, have for example in the past couple of decades moved their basically consensus-oriented social democratic and Keynesian interventionist liberal economic ideology in a direction that favors more (political “hands off”) liberal solutions. This has often resulted in the introduction of New Public Management (NPM) arrangements for public utilities and services. This was also the largely EU model that the NGF was to adapt to following the EEA-agreement, cf. Chapter 3.

*“Since the late 1980s there has been a weakening of traditional political-administrative governance, with a larger emphasis on commercial rules and principles” (Andersen 2001:347, my translation).*

In the Weberian national bureaucracy (Weber 1978) based on rationality, neutrality and predictability, innovations in the public sector are considered unthinkable. In the energy sector, this has reflected a commercial attitude among consuming nations after the price drop in 1985/86;

*“oil was becoming just like another commodity” (Yergin 1991:721).*

However, critics became plentiful. NPM approaches

*“have ignored the accommodation of innovative forces in the public sector, and not least the role the public sector has played in innovation in the private sector” (Rønning 2007:77, my translation).*

*“NPM has by itself been an innovation in the public sector “. “In this context it is (however) important to keep in mind that cost effectiveness for both public and private activities are only a measure and not a goal. For the public sector it is imperative to reach important social goals. For the private sector profits can be a goal, but in this context cost effectiveness is only a defensive measure.” “If the public sector is to contribute to innovation and change it must be organized in a different way, than if they are to only administer routine operations” (ibid:95-96, my translation).*

The integration with the EU is part of reason for the Norwegian public sector’s movement towards this type of liberalism and NPM political solutions,

together with trends to be found in global liberal ideology (that have also influenced the EU). International regimes, laws and regulations made outside the nation state create policy convergence, but different public traditions also create divergence.

*“Regulations are interpreted, reformulated and implemented within traditions and provide basis for innovative modernization”. “Imitations taken from the traditions of one public sector may become innovations within another” (Veggeland 2007b:98, my translation).*

Europeanization (and “globalization”) of debate and thinking has been taking place in Norway and elsewhere. The concept of Europeanization is however often used without any precise definition. The so-called Ladrech / Radaelli definition (Radaelli 2000, Ladrech 1984) of Europeanization is

*“a set of processes through which the EU political, social and economic dynamics become part of the logic of domestic discourse, identities, political structures and public policies” (Ladrech 2001:3).*

Laxer (1995) defines the term ‘globalization’ as

*“the norms, institutions, and laws that support global capital accumulation along neo-liberal principles”.*

The compatibility between EU and domestic policy has increased with structural convergence between institutions and policy (Cowles, Caporaso and Risse 2001) but also through dynamic processes of adaptation.

*“In these processes, the interaction among actors can, given institutional constraints, lead to re-evaluation of interests, re-formulation of conflicting issues and adoption of new perspectives or knowledge” (Claes 2002b:300).*

Hence, Europeanization (and globalization) has exerted an influence on legal matters, institutions, as well as on norms and ideology as a continuous process, and not merely through a discrete change from one equilibrium to another, when an agreement enters into effect.

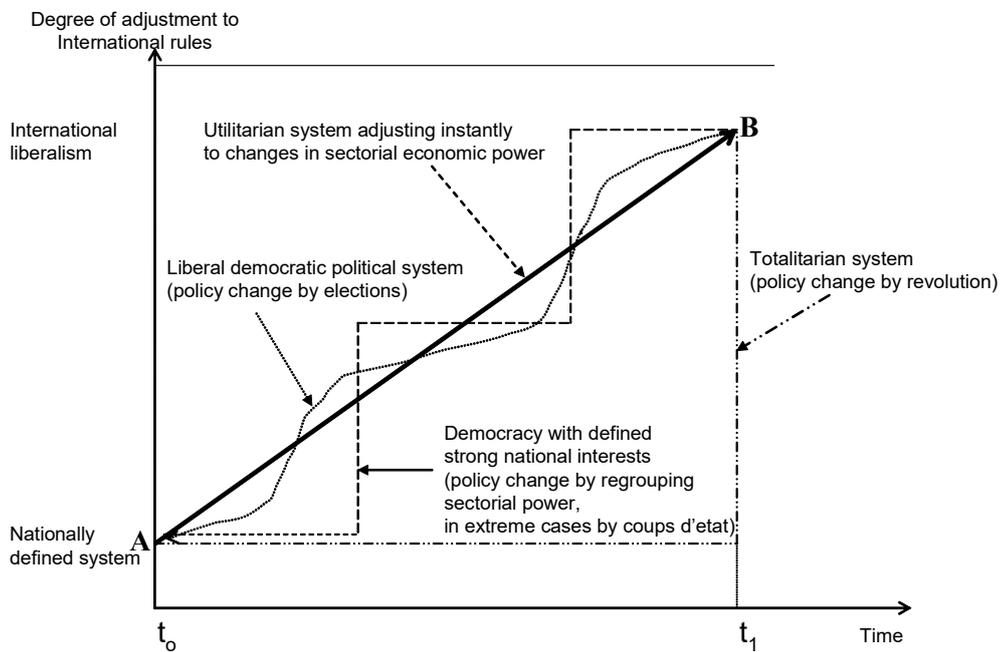
In general, the principles of an economic integration agreement more clearly define the long- than the short-term path of national policy. Government’s

responsiveness to such principles depends on regime type; a democracy will, for example, more easily change policy than a more authoritarian regime.

*“The most basic institutional determinant of government responsiveness to a change in the constellation in societal preferences is the ease with which incumbents can be replaced” (Garret and Lange 1996:59).*

Figure 1.3 illustrates a conception of how an international economic agreement is reflected in policy change under different types of regime.

Figure 1.3: Policy change and regime types



Developed from Garret & Lange 1996:62

At  $t_0$  our (hypothetical) economy is governed by a nationally defined economic system (point A). At  $t_1$  the system has adopted fully to an international liberal system with common rules (point B). A utilitarian and neo-functionalist view would emphasize that institutions and policies adjust to what is optimal according to the international agreement, and at its extreme follow the straight line between A and B. A supplementary view would be that institutions themselves play an important role in the determination of social and political

outcomes.<sup>13</sup> Policy changes would thus change with elections, as illustrated in the oscillating curve. As John Maynard Keynes (1924:Ch.3) famously noted;

*“Long run is a misleading guide to current affairs. In the long run we are all dead”,*

so also for governments. (Radical) policy change most often comes when governments change.

Policy change will be less frequent when national sectorial interests are strongly opposed to the international regulations. This is especially the case when opposing a change would not lead to a loss in a general election at home. The same might be the case in non-democratic regimes where

*“legal and constitutional procedures for replacing governments are less developed” (Garret and Lange:62).*

The threshold for policy change would be significantly higher and policy more stable, but eventually

*“followed by bursts of rapid policy change. ...” (ibid).*

To contrast this situation with strong resistance to (sectorial) change, but eventually adopting the international system, a totalitarian system would not change at all before a revolution takes place (cf. for example Albania before and after 1991).

In general, to therefore unravel the impact of the international economy and system on domestic policy, one must understand the interaction between and relative weight of the factors influencing policy. Over time, institutional interests may tip the balance to be more significant than current economic interests, at other times institutions must change. Ideology may prevail over industrial policies and economic interests at a specific time, while challenges from exogenous changes in the international political economy at another point in time may change ideology.

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<sup>13</sup> There are various schools of thought about the role actually played by institutions. See for example Hall and Taylor (1996) about the “Three New Institutionalisms”. Krasner (1988) compares inter alia institutional vs. utilitarian perspectives.

Hence, exogenous change relevant for a (or portion of a) country's international competitiveness changes the constellation of actor's preferences in the domestic economy, as identified in international trade theory. These preference changes are filtered through the political system and its associations and groupings to affect policy choices of national governments.

*"Extant institutions mediate in the relationship between internationally induced changes in policy preferences for domestic actors, on the one hand, and policy outcome (both policy and institutional change), on the other" (Garret and Lange 1996:49).*

If domestic institutions are weak, impact from exogenous change might be high. If they are strong the impact will be less significant (Keohane and Milner 1996).

The Norwegian natural gas entrepreneurship was a built with strong institutions and policy preferences and it is to be expected that in its first adaptation to liberal EU principles (adapting to the EEA agreement) it will follow the kinked curve with reduced policy change compared to the AB line, as discussed in Chapter 3.6. If however the EU modifies policy in this sector, or policy *de facto* remains incomplete in realizing a fully liberalized market, cf. Chapter 5.2-5, point B will move towards point A and the difference between the systems will be reduced, and their relation changed. It will in our case result in a weaker pressure for policy convergence with the EU, because the EU model has then moved closer to the Norwegian model. We will return to these issues in Chapter 3.6.

## **1.6 The interaction between external and domestic agents**

Weiss (1998, 2003) questioned the effects of convergence between integrating economies' institutions and policies associated with globalization, and pointed to the mediating role played by domestic nation-state institutions. She argued that that the effect of non-state powers have upon a government can be enabling, as well as constraining. Rather than a movement towards a neo-liberal model, she sees the emergence of what she calls 'governed interdependence'. In analyzing the relation between two international political parties (countries), the liberal intergovernmental approach of Moravcsik (1993b) similarly underlines the

importance of bargaining power and skills, along with the constellation of domestic and international actors in understanding policy outcome.

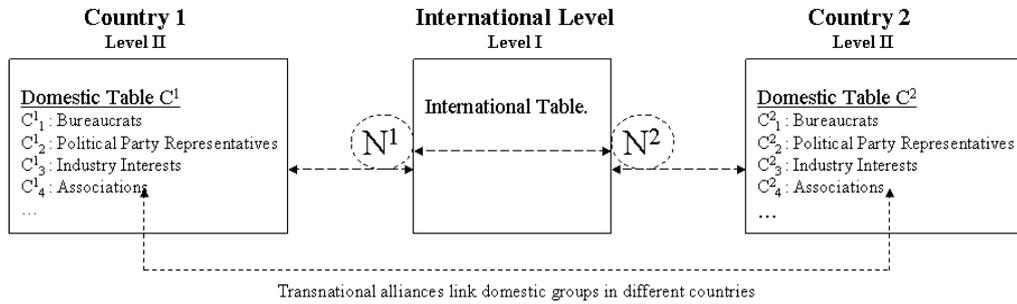
In his two-level game Putnam (1988) presents a model for how to understand the interaction between domestic and external agents:

*“The politics of many international negotiations can usefully be conceived as a two-level game. At the national level, domestic groups pursue their interests by pressuring the government to adopt favorable policies, and politicians seek power by constructing coalitions among those groups. At the international level, national governments seek to maximize their own ability to satisfy domestic pressures, while minimizing the adverse consequences of foreign developments” (ibid:434).*

In this game a national leader (or chief negotiator) simultaneously sits at two tables, one international and one domestic, such that domestic and international mechanisms and interests can be reconciled. In our discussion of this model, domestic tables in two countries  $C^1$  and  $C^2$  are added. Figure 1.4 illustrates the situation as a two-level game on three tables: one international level I table, and two domestic level II tables. Agreements made at the international table must be accepted (ratified, or agreed upon in formal or informal ways) at both domestic tables. There will be no agreement if the international table does not make one, or if an agreement made is not accepted at one of the domestic tables.

The processes of international negotiation and domestic acceptance may take place simultaneously or sequentially, as one game or multiple games, and also on more than one level as the domestic side gives the game a multilevel character. Negotiator  $N^1$  must simultaneously consider the acceptance of an agreement by key actors at home ( $C^1_i$ , where there are  $i=1\dots m$  relevant actors), as well as by actors in the other country ( $C^2_j$ , where there are  $j=1\dots n$  relevant actors). Some domestic actors in each country might have more influence than others on the process and the acceptance or rejection of an agreement, and it may vary over time and issue.

Figure 1.4: Two-level games on three tables



Developed from Putnam 1988:427-460

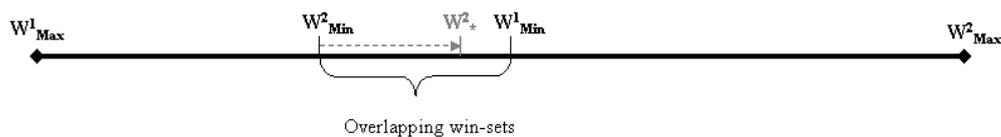
The set of possible Level I (international) agreements that might be accepted on each of the domestic tables (at Level II), respectively, is called a “Win-Set”. The larger the Win-Set on one side or the other, the more likely it is that a Level I agreement can be made. It is only when Win-Sets in both countries overlap that an agreement can be made. An agreement can be rejected on both voluntary and involuntary grounds. Voluntary defection refers to renegeing on an agreement because the negotiator considers it as not enforceable or acceptable. An involuntary defection refers to a situation where the negotiator is unable to deliver because he / she has failed to gain acceptance at home at the domestic table. This means that the smaller the Win-Sets, the greater the risk for involuntary defection. Often the size and shape of the Win-Sets are uncertain, both at home and abroad, and the *expectations* about them become important elements in shaping strategies between  $N^1$  and  $N^2$ .

An international agreement is negotiated because both parties think they will benefit compared to a no-agreement situation. The relative size of the two Win-Sets affects the distribution of gains from a bargaining situation. However, the more that can be accepted (the larger the Win-Set), the more room there is for the *other* party to maneuver; and a small (according to the other party’s perception) domestic Win-Set can represent a bargaining asset. If the negotiator is unable to make concessions because his domestic actors are not willing to accept much change, the other negotiator must make concessions to prevent the agreement

from breaking down. At the same time, small Win-Sets bring a greater risk of stalemate or the breakdown of negotiations.

Figure 1.5 simplifies the situation to a zero-sum game where  $W^1_{\text{Max}}$  and  $W^2_{\text{Max}}$  is the maximum welfare to be gained from negotiations for country  $C^1$  and  $C^2$ , respectively. The best outcome for one party represents the worst outcome for the other; cf. the game presented in Figure 1.2.  $W^1_{\text{Min}}$  and  $W^2_{\text{Min}}$  represent the minimal outcomes acceptable in the domestic arena of the two countries. If the area between these minimal outcomes for the two countries overlaps, an agreement can be made. If the minimal outcomes do not overlap at all, there will be no agreement.

Figure 1.5: The benefit of smaller Win-Sets



Even though each country in total may have net economic benefits from an agreement, the cost and benefits are not necessarily evenly distributed between them. Most often there are also winners and losers within a country. If the negotiations are too hard on behalf of the winners, this may lead to domestic divisions and the risk of involuntary defection and no agreement at Level I. The domestic interests that are most affected can be expected to exert most influence during the negotiation and acceptance process.

Hence, the size and shape of the Win-Sets depend on Level II institutions, preferences and coalitions, as well the negotiators' strategies. This means that the lower the opportunity cost of no agreement (the "walk-away price"), the smaller the Win-Set. The more dependent a country is on the other, the more must be accepted and the larger the Win-Set. The smaller and more open a country's economy, the larger the Win-Set. The more complicated an acceptance procedure, the smaller the expected Win-Set. Secret negotiations without the involvement of

public opinion, and close ties for example between government and the industry in corporative states, are much more easily ratified:

*“the greater the autonomy of central decision makers from their Level II constituents, the larger the Win-Set and thus greater the likelihood of achieving international agreement” (ibid:449).*

Paradoxically, with the larger Win-Set, their international bargaining position is weaker. Thus, a “strong state” domestically may actually become a weak one internationally; a dictatorship is more easily “pushed around” in negotiations than a democracy (ibid).

Consequently, each negotiator will have an interest in maximizing the *other* sides’ Win-Set. Each has an interest in making a deal look favorable at the other side’s domestic table. He or she has, however, a mixed interest in their own Win-Set’s, such that a larger Win-Set results in a weaker position against the other negotiator. At the same time, a large Win-Set makes it easier to conclude an agreement. Optimally, if  $N^2$  succeeds in making  $N^1$  believe that his Win-Set is not stretched all the way down to  $W^2_{\text{Min}}$ , but only to  $W^{2*}$ , he/she will have the potential of a better deal. Obviously, negotiators have the incentive of understating their own Win-Sets and tell the other that it is “kinky”:  $N^2$  can for example tell  $N^1$  that if a deal is to be accepted at the domestic table in  $C^2$  it can not be worse than let’s say  $W^{2*}$ . A worse deal will probably not be ratified. Feasible agreements will be truncated in  $C^2$ ’s favor (as perceived by  $N^1$ ), while  $N^2$  at the same time maintains the same favorable chance of getting the deal accepted at home.

The controlled exchange of partial information, secrecy and surprise, restructuring the game and altering the other side’s perception of the costs and benefits of agreements are part of the game. Luttwak (1990:19) describes some of these processes as belonging to the

*“logic of war in the grammar of commerce”.*

Diplomacy is in this context

*“a process of strategic interactions, in which actors simultaneously tries to take account of and, if possible, influence the expected reactions of other actors, both at home and abroad” (Moravcsik 1993b:15).*

This includes targeting policies and groups in other countries in order to place allies on the counterpart’s domestic table.

There will be a balance between getting acceptance at home, and at the same time pushing the agreement as far towards the other side’s minimal point of outcome as possible. If it is important to both negotiators to reach an agreement, they may also collude, and help each other to get a deal accepted. To expand the one or both of the Win-Sets, side-payments can also be used either for domestic actors wanting/not wanting an agreement, or as part of an international negotiation (for example as various forms of counter trade deals).

Domestic groups across countries (at domestic tables) may also cooperate to prevail over other domestic groups and government(s) through transnational alliances, cf. Figure 1.4. This occurs when domestic groups in more than one country agree to cooperate with the goal of influencing other domestic groups or the governmental opposition. This can happen when companies in the same sector in different countries coordinate positions. Informational asymmetries may emerge, as part of the negotiation process. Transnational industrial alliances are not concerned with the maximum benefit for their own country, but for the best for themselves across borders. Transnational industrial alliances can, for example, be used to make it more difficult “domestically” for the EU, when it comes to the implementation of unfavorable market regulations and interventions for natural gas producers, cf. Chapter 5.6.

The two-level game comprises both “Second Image” and “Second Image Reversed” effects as identified by Waltz and Gourevitch, respectively, and shows that domestic policies influence international affairs, and vice versa. A nation can be considered the state as such, or the civil society under its governance, or both, and it may change over time. The result of a negotiating process may consequently differ from the economic preferences of domestic actors, as well as from how domestic political processes have sought to define national interests.

Taken together, economic integration can be considered the process whereby obstacles to trade are gradually eroded and policies harmonized. The opportunity costs of disintegration gradually increase and the walk-away-price becomes more unacceptable. As countries become more economically integrated, it will become increasingly more difficult *over time* for all participants to *not* reach agreements that further integration, such that lower levels of integration push for higher levels of integration, in order to make it work. A country's bi- and multilateral foreign policy, as well as sectorial ministries, associations, industries and single company strategies must therefore include significant amounts of information gathering about international economic integration processes.

For small countries, more often than for larger counterparts, making alliances with other countries will be important. Small countries or interest groups, good reasoned argumentation and good alliances can significantly influence the outcome of a negotiation process. Paradoxically, the greater the degree of autonomy a country chooses in an economically integrated world, the less influence the country will possess over its own situation. This is because international rules of competition and market mechanisms in many situations *de facto* to a large extent overrule (irrelevant) national decisions, and a country is increasingly "pushed around" and forced to adapt.

Policies only become coherent if the government is able to interact simultaneously on domestic and international tables. This is demonstrated by the scope of this study; where it is argued that Norway's natural gas entrepreneurship is affected domestically by the EEA agreement, as well as by "external" EU market liberalization processes, and their interactions. Outcomes depend both on legal matters as well as on economic and political factors, actors and mechanisms and the adaptation to these. The more complex the situation becomes, the more difficult it will be to reach *de facto* comprehensive supra-national arrangements, and as a result, the bigger the maneuvering room for national adaptation.

The Norwegian - EU dispute about abolishing the GFU and introducing Third Party Access ( TPA) on the NCS, cf. Chapters 2.5 and 3.2, are examples of how both parties have tried to influence each other's Win-Set, and at the same time

give the impression that their own Win-Set was extremely truncated. The Norwegian and EU Win-Sets were initially considered not to overlap. Eventually however, the solution was that Norway adapted formally to EU rules and regulations, and at the same time gave the content of policy a Norwegian flavor and increased the role of the state. In this way a deal could be reached. The formal Win-Sets were enlarged for both parties, while their *de facto* content were not changed too much for Norway compared to her goal to maintain the main purposes of the NGF. She had however to change the ways in which she exercised the entrepreneurship, cf. Chapter 3.6.

## 1.7 Economic integration and political entrepreneurship

This *first* focus of this chapter was to provide a foundation for understanding of political industrial entrepreneurship based upon theory of endogenous growth. A state as social or political entrepreneur has (or should have) more long-term concerns for society and a more comprehensive view on economic activity than a private entrepreneur. The goals set up for the political entrepreneur depend on ideology which was listed in three main groups; liberalism, realism / economic nationalism and historical structuralism. Different ideologies provide different political goals, as well as different political practices. In terms of instruments available to reach goals, the state has more instruments at hand than a private entrepreneur. The state can engage itself in a business directly, similar to a private entrepreneur (as a production entrepreneur), but also through political and legal interventions, and regulative measures, that influence economic activities and the ways in which innovations take place. The political entrepreneur can also be a substantial risk-taker, including political risks of failure, as well as through direct financial contributions. Some projects can be of such a character that they would never be realized if political entrepreneurship was not exercised. The factors and mechanisms that determine the maneuvering room and policy options for political entrepreneur are interactive, of a qualitatively different kind and can change over time.

The discussions indicated that it is the *relative* ability to develop policy that is important in order for a country to remain competitive in an economically integrated world. A neo-Schumpeterian understanding of trade and international

competitiveness supports the significance of (private) entrepreneurship and innovation in maintaining and creating competitive advantages (Fagerberg 2007). This dynamic understanding of competitiveness is, in this study, extended to the role of a political entrepreneurship, where the state is seen as an important collaborator, or even leader, in domestic industrial developments. For the political entrepreneur it is important to understand the motives and policies of integrating partners. This requires always being ahead to influence them, as well as to make precautions and strategies that avoid problems and exploit opportunities, rather than just copying laws and regulations of others in a passive manner. In integrated economies traditional trade (and exchange rate) policy measures must often be replaced with “hidden” barriers and influencing, interpreting and adapting to common rules and regulations.

This parallels what Posner (1961) identified as respectively innovative and imitative countries and industries experiencing technological and commercial change, where the continuous ability to innovate is a force used by the leading country to maintain its advantage and achieve the highest economic standards. It is important to be continuously in the lead in political understanding, adjustments and influence the policies of integrating countries so as to maintain advantages and freedom of action, compared to a potentially more passive (imitative) political attitude. The dynamism based upon the technological, commercial *and political* ability to innovate will be decisive for continued relative competitiveness:

*“Like Alice and the Red Queen, the developed region has to keep running to stay in the same place” (Krugman 1979:262).*

The *second* focus in this chapter has been upon how factors and mechanisms from the integration processes influence the maneuvering room and policy options for the political entrepreneur. While more open trade in most cases increases wealth, the distribution of benefits does not have to be equal between countries. International trade also leads to redistribution and conflict of interests about, wealth and power within a country. Often the benefit for consumers comes relatively quickly, while producers need more time to make adjustments in order to exploit the benefits of new prices and markets. While export oriented

firms gain, import competing firms lose. The political economy of international trade focuses on how prices and markets can be influenced by a branch, a region, a country or a company. The more imperfect markets are, the more important is the behavior of the participants, being political, regulative or commercial. New regulations, degrees of supranationality and redistributive effects of market integration change the role of governments. However, the complex interdependence arising from deeper integration can lead to more options in maneuvering room and policy, depending on the evolution of integration processes, national interpretation and adaptation by political and commercial actors. Principles for non-discriminatory behavior and reciprocity are clear, but situations and their practical implementation and understanding may vary. Hence, the direction of influence and changes that are caused by more open trade can in most cases be identified, but their scope and strength may vary. For a political entrepreneur, the outcome depends in part on the innovative ability to change policy and defend important national goals within the framework of new rules and regulations.

Economic integration does not only lead to the harmonization of costs and prices; countries also become increasingly similar and converge in their design of economic *and* social policy. Both legal and competitive forces eventually generate a pressure towards the harmonization of political institutions, and in many cases force them to execute policies defined by agreements and common institutions. For example, the Norwegian Competition Authority (NCA) has as a main task to enforce Norwegian competition law, but is supervised by ESA who oversee whether her practices comply with EU competition law. In some areas, cases are moved from NCA to ESA for final decision, for example when larger companies merge (such as with the case of the StatoilHydro merger in 2007).

In addition, those benefiting the most from the new situation will usually become politically stronger compared to other domestic actors. Business oriented interests will in general be given a stronger say in policy formation in a more liberal economy. As foreign policy through treaties becomes an explicit factor for the organization of industrial activities, a country's Foreign Ministry with its comprehensive contact with international organizations and other countries gains a *relatively* stronger say within the government, at the expense of other ministries.

However, all sectorial ministries increasingly rely on contacts with international organs set up for policy execution.

*Thirdly*, integration levels and theories were discussed. The international agreements made with and within institutions like the WTO and the EU, are negotiated by countries and groups of countries colored by their preferences. Important to the scope and strength of an integration process is *inter alia* the degree and scope of supranationality. *Ceteris paribus*, the maneuvering room and policy options for a nation state's policy are considered greater, the fewer the federative aspects of the agreement. In EU studies, neo-functionalists and constructivists point to the potential for further integration and the role of a common decision maker in Brussels; neo-functionalists through functional and political spillovers, constructivists through changes in identities and preferences resulting from cooperation over time. On the other hand, institutionalists and intergovernmentalists are more skeptical to both spillovers and socialization. The institutional and policy integration are for them is less likely to change in the foreseeable future, and policy will continue to be defined through inter-state processes. Even though liberal ideology dominates when a country enters into deeper levels of integration with others, some situations are the source of a significant maneuvering room, domestically and/or internationally, while other situations do not offer a great degree of freedom of action. The consideration of the EU as a "weak" state structure resulting from intergovernmental bargaining opens a greater maneuvering room for a national political entrepreneur, than if the EU is considered a "strong" state structure, in which member countries are compelled to follow a powerful (and entrepreneurial) EU Commission.

The impacts on a state's industrial entrepreneurship of international (or European) economic integration come first through legal bindings. Common, or harmonized, laws and regulations increasingly bind national policy with higher levels of integration. In a common market formal bindings on policy are set, in principle, in all areas that influence the competitive position of industries. These include bindings on fiscal policy, such as subsidies, but in principle everything that influences the cost of running a business and improves the competitive position of national versus foreign firms.

Lower levels of integration, such as expanding the scope of a FTA, are mainly concerned with reducing or eliminating traditional trade policy measures and negative integration, such as removing or reducing tariffs and quotas. Higher levels of integration in a common market are more concerned with positive integration and policy harmonization. Included in this are the political and social effects of market integration. Beyond the common market, entering into an economic and monetary union is another qualitatively large step. More common rules and institutions as countries are more deeply integrated result, as national governments are losing the right to formulate nationally defined policy. The case of the independent central bank's control over monetary policy is a case in point.

The *fourth* point this chapter has focused on, is the dynamics of economic integration processes. These indicate that lower levels of integration push for higher levels. As with innovation processes in entrepreneurial activities, policy coordination in economic integration processes may take place in an incremental manner, but it is sometimes discrete or radical. Within single sectors, countries try to reap the benefits of trade in general, and avoid the sectorial problems it creates at the costs of the other country, being exporter or importer. The struggle between open and restrictive trade may continue after an agreement has been signed, which makes hidden and indirect barriers among the most important issues discussed in present trade talks. In the Norway - EU case, both parties benefit from positioning themselves to favor free trade in general, and at the same time formulate (in parts) an independent policy as far as possible for sectorial and revenue interests, without breaking the overall deal. The ability of nation-states to reach their goals, with the loss of sovereignty that the integration process entails, is important for the balance of interdependency. Small countries are often more unified in defining preferences and policy. Clever adaptation can partly outweigh an obvious formal, economic and political asymmetric interdependence when measured by the "meat weight". The EU system must on her side continuously compromise interests across countries, which may delay and weaken her decisions, creating larger maneuvering room for national policy making.

In some cases it is the form of national arrangements that are important and must be changed to make them legally comply with an agreement and its principles, in other cases it is the substance of an issue that is central. When it is the form, a national government has a chance to change for example an existing organizational model within the structure of the agreement, and simultaneously maintain its purpose, cf. Chapter 3.6. Hveem (1994:287) highlights three elements as important in the implementation of decisions in such a situation: organizational and institutional capacity, capacity to innovate and the ability to make people identify with chosen strategies and institutions. There can however be considerable variations in domestic adaptation to such factors:

*“If the country is not affected by the EU regulation the problems of policy similarities do not arise. Only if policies are not similar the need for bargaining opportunities arises. And finally, only if bargaining opportunities are not available, the need for legal proceedings arises” (Claes 2002b:304).*

Still then, it is a question about the size and scope of maneuvering room in the adaptation to regulations and rules, cf. Chapter 3.6.

*Fifthly*, exogenous change as a source of domestic policy change was analyzed. Domestic policy can change as a result of changes in the cost and/or rewards of international economic exchange, as well as from changes within the country. Exogenous change relevant for a country’s international competitiveness changes the constellation of actor’s preferences in the domestic economy. These preference changes are filtered through the political system and its associations, institutions and groupings to affect the policy choices of national governments. When domestic institutions are weak, impact from exogenous change will usually be more significant than if they are strong. If institutions are strong, pressure for de-coupling from EU requirements may be the product of institutions that shape local identities, norms and even preferences (Andersen 2006). Policy change should also be less frequent when national sectorial interests are strongly opposed to international regulations. This is especially the case when opposing a change would not affect other domestic interests (such as losing a general election). If the EU modifies policy the difference between the incumbent national system and the EU system is reduced, and their relation changed. A

national system may not follow a neo-functionalist view which results in a situation with *de facto* common rules, even if rules *de jure* are the same, when strong national interests are to be defended.

*Sixthly*, a two-level game seeking to account for the interaction between domestic and external agents was presented, and it was shown how domestic policy can influence international affairs and vice versa. The definition of what is a “national interest” is ambiguous and depends on the constellation of domestic actors. The game showed, paradoxically, that the greater the degree of autonomy a country chooses in an economically integrated world, the less influence the country will possess over its own situation. International rules of competition and market mechanisms will in many situations *de facto* override national decisions, and the country will increasingly be left to adaptation. Policies only become coherent if the government is able to interact *simultaneously* in domestic and international arenas. Outcomes depend both on formality (legal matters), as well as on economic and political factors, mechanisms and the adaptation to them. The more complex the situation becomes, the more difficult it will be to reach *de facto* comprehensive supra-national arrangements. And as a consequence, the bigger the maneuvering room for national policy making. Comprehensive formal arrangements may in such cases provide the opportunity for substantial autonomous national interpretation.

The ideological change taking place in an economic integration process, pressuring for industrial and political change, follows from the basic idea and intention of pursuing greater economic integration with other countries. It is from the outset a political decision for a country to move to a higher level of integration with other countries and to liberalize economic transactions. The purpose of the harmonization of law and regulations is first and foremost to make competition work, but in advanced integration arrangements such as the EU also seek to maintain the conditions of a welfare society. As long as unemployment does not become “too high” or other social or political problems arise, the well-being of a country becomes more strongly based on liberal ideas than before (meaning more specialization and reciprocal trade). Even though it is not a question of returning to *laissez-fair* economics and a politically totally passive state in industrial (and social) affairs, international economic integration

is a step supporting an ideological view that the state should adopt a weaker and more regulative political hand on industrial (and social) policy than before, when compared to more interventionist attitudes in Europe after WWII. A more liberal ideology and economic integration weakens the nation-state (Mann 1997).

However, this may not remain a static truth in its simplest form. The link between a liberal ideology and what is “fair” competition may be seen in different ways. It is not only the costs of production and the freedom of each actor to make her and his choices independent of the macro situation that is important for competitiveness. Optimized individual decisions may in many situations create suboptimal macro outcomes (Schelling 1978). Furthermore, it has long been argued that an effective state is an integral part of a successful competitive capitalist system (Evans and Rueschemeyer 1985).

This appears to be particularly true for developing economies. Evans (1995) looks for example on how state agencies, local entrepreneurs and transnational corporations shape the emergence of computer industries in Brazil, India and Korea in the 1970s and 1980s. Differences in industrial performance can be connected to differences in state structure;

*“The comparative evidence suggests that the efficacy of the developmental state depends on a meritocratic bureaucracy with a strong sense of corporate identity and a dense set of institutionalized links to private elites” (Evans 1989:561).*

More than 60 years ago Gerchenkron (1943) argued that the less developed (or competitive) a nation’s economy, the more important the state becomes as an actor in the promotion of industrial development. Hence, a “weak” or passive state, may lead a country to remain underdeveloped (or more moderately lose competitiveness).

For developed economies, Mjøset and Andersson (1987) argue that

*“neo-liberal policies aim to promote flexibility by reducing the impact of the state, by liberalizing labor markets and by relying on full integration within the world economy. Alternatively, we argue... that policies should aim to promote flexible specialization making the welfare state a comparative advantage in connection with industrial policies, by extending efforts at democratization of decisions concerning labor process organization and work environment”.*

In a “flexicurity” approach for welfare states, Veggeland (2007a) similarly argues that flexible labor markets also

*“depend, per se, on the continuing existence of universal social security and public neighborhood services”.*

High public welfare expenses and a heavy tax burden can be

*“compensated by high work productivity, low unemployment, flexible labor market, and encouraging subsidiarity policies” (ibid.).*

Some of these arguments are also to be found in Barth, Moene and Wallerstein (2003).

As a consequence, there is a continuous debate about the formulation of social and industrial policy, and what will be the best for trade and fair competition within a liberal paradigm, with a focus on more than costs. Keynes was for example also a liberalist, but a rather interventionist one, compared to dominant present-day perceptions of the more passive role of the state in industrial policy. Debates over types of design of a liberal economic system and varieties of capitalism, as in Hall and Soskice (2001), Mjøset and Clausen (2007), demonstrate that liberalism must not necessarily be orthodox. Possible variations in a liberal system are compatible with the basic ideology of the EU system, albeit in opposition to those suggesting a change to a non-liberal economic system (e.g. Elster and Moene 1989).

Although the picture is not black and white, the more fragmented state and domestic political situation caused by the integration processes indicates that the preconditions for the strength of a national political entrepreneurship and the ability to reach new national consensus will be generally weakened. This challenge appears to be especially great for newer member countries to the EU, as well as developing countries in the poor world. But, it also exists for rich Norway with her (in some areas) diverging interests in the EU with respect to the petroleum sector. The increased complexity of decision-making indicates that more, not less, political competence is required in comparison with the 1970s and 1980s, when national interests should be defended.

### 1.7.1 Implications for the empirical analyses

The discussions showed that while integrating more deeply with other countries, a state is affected domestically, both as a production ('private') entrepreneur and as a political (regulative or interventionist) entrepreneur, through laws and regulations and other effects from the integration process, as discussed empirically in Chapter 2 and 3. It is also affected because things are done differently in both political and commercial terms in the integrating partners' *markets*, where products are sold. Even though a change does not formally affect domestic industrial organization and behavior at all, its impact on market prices, and commercial and political terms of operation may be of the greatest importance.

Chapter 2 outlines how and to what extent the Norwegian state operated as an entrepreneur in the establishment and development of its petroleum industry, and how her natural gas model was influenced by industrial and market maturity, as well as by domestic and external political change. The theoretical basis for this discussion is found in Chapter 1.1, focusing on endogenous growth theory and political entrepreneurship. The discussion is also supported by the theoretical outline in Chapter 1.5, focusing on how both domestic and international exogenous change affects a national political entrepreneurship, and the discussion in Chapter 1.6 concerning the interaction between domestic and international agents in the two-level game.

Chapter 3 focuses on the how the EEA agreement has changed and challenged the maneuvering room and policy options for the Norwegian natural gas entrepreneur. A discussion of the EEA agreement is given a section of its own in the chapter. To understand the logic of, and opportunities and constraints for Norway within the EEA agreement, the theoretical discussions in Chapter 1.2 concerning welfare effects of deeper economic integration, and the dynamics of economic integration processes in Chapter 1.4 are of particular importance. The game between Norway and the EU when adapting to the EEA agreement presented in Chapter 3.3, represents an illustration of the fact that the struggle between open and restrictive trade may continue on more modest levels, also after an agreement has been signed, as discussed in Chapter 1.4 (cf. Figure 1.2).

The discussion in Chapter 1.5, concerning how exogenous change may lead to different types of domestic policy change, depending on the degree of conflict between the nationally defined system and the type of liberalism a treaty introduces, and on national adaptation, is also noteworthy. The Norwegian - EU disputes about the GFU and the introduction of TPA on the NCS, are examples of how both parties influenced each other's Win-Set, and modified the *de facto* content of the change. They are outlined theoretically in Chapter 1.6. The background for this understanding is presented in the discussions of theories for economic integration in Chapter 1.3 and also Chapter 5.2, focusing on the intra-EU debates to define and interpret the borderlines between national and EU policy competence.

Chapter 4 focuses on what a largely fully liberalized EU market for natural gas would look like, and how it would affect the Norwegian state as natural gas entrepreneur. The idea to change the functioning of the EU Single Market and the liberalization of her gas markets, matches politically to a great extent the neo-functionalistic conception of EU developments, as outlined theoretically in Chapter 1.3. The discussion in Chapter 1.5 is important as a backdrop to understand how various designs of a liberalized market may and may not, conflict with defined national interests.

Chapter 5 discusses main constraints to a complete EU natural gas market liberalization, and its modifying effects on the Norwegian natural gas entrepreneurship, as compared to full liberalization discussed in Chapter 4. One constraint discussed is the intra-EU political situation, cf. Chapter 5.2, and as discussed theoretically in more detail in Chapter 1.3. A second constraint discussed in Chapter 5.3 concerns the challenges caused by the fact that almost all new gas must be imported from non-EU countries in large amounts. The theoretical questions over energy security for both importing and exporting countries are given a section of their own in the sub-chapter. Challenges concerning asymmetric interdependence caused by economic integration are supported by Chapter 1.2.

A third constraint to full market liberalization discussed in Chapter 5.4 is the non-renewable nature of natural gas. The theory for non-renewable resources is

given a section of its own in the sub-chapter. Chapter 1.2 provides a backdrop for the discussion concerning whether or not the natural gas market should be given a design attributed to its particularities rather than a straightforward shape similar to those in non-competitive markets for “normal” goods and services.

A fourth constraint discussed in Chapter 5.5 is connected with the economics of natural gas regulation. Important regulatory challenges in such markets are reviewed in a section of its own in the sub-chapter. The point made is that it is reasonably easy to argue both for and against most solutions when determining tariffs and other regulatory issues, and outcomes can be heavily colored by the economic and political strength of the parties. Chapter 5.6 focuses on the understanding of the political natural gas entrepreneur, and how it is influenced when the EU approaches her limits to market liberalization, as compared to the more idealized version presented in Chapter 4.

Chapter 6 draws together some conclusions from the analysis. Main empirical findings are outlined. An assessment is made of the multidisciplinary approach, as defined in the Introductory Chapter, and discussed theoretically in Chapter 1. The chapter also focuses on what can be learnt from the study concerning Norwegian petroleum policy and the Norwegian – EU relationship, respectively. Finally, remarks on possible theoretical implications are proposed.



## 2 The Norwegian state as natural gas entrepreneur

When Norway entered into integration with the EU in the 1990s her petroleum industry was under strong political control. This chapter outlines how and to what extent the Norwegian state operated as an entrepreneur in the establishment and development of the petroleum industry, and how the natural gas model was influenced by industrial and market maturity, and by domestic and external political change. Firstly, the establishment and development of the Norwegian petroleum sector and the role of the state as interventionist entrepreneur, is described. Secondly, Statoil's role as a political instrument is discussed. Thirdly, impacts on Norwegian gas policy from exogenous changes linked to the U.S. embargo of Soviet gas in 1982 and the British rejection of the Sleipner deal in 1984 are analyzed. Fourthly, the role of the Petroleum Fund in *de facto* removing production restraints, and opening the maneuvering room for the political entrepreneur, is discussed. Fifthly, impacts from exogenous changes linked to integration and policy harmonization with the EU are outlined. Sixthly, the role of the state as regulatory entrepreneur of a mature industry and capitalist on the NCS, integrated in the EU Single Market, is outlined. Finally, the role of the Norwegian state as political entrepreneur for natural gas activities on the NCS is discussed.

### 2.1 The establishment and development of the petroleum industry

In 1958, the Norwegian geological survey (NGU) stated in a letter to the Ministry of Foreign Affairs (MFA) that it was impossible that the NCS could contain any "oil, coal or sulphur". Together with the low oil prices at the time, this perception

contributed to a limited interest for the area from the international oil companies in the 1960s (Andersen and Arnestad 1990). Exploration efforts accordingly started with rather liberal conditions for companies after the first round of concessions in 1965.<sup>14</sup> In the second concession round in 1969, the state put stricter regulations into effect in order to secure economic interests and to support the Norwegian supply industry and labor interests (Rudsar 1998:22). When Philips Petroleum eventually found the first oil at the Ekofisk field just before Christmas 1969, the oil companies pressured for expanded exploration and development activities, and for the best possible terms and rights.<sup>15</sup>

When it was anticipated that production would become profitable, political ambitions for national control were however strengthened. It was agreed across party lines that oil revenues, and in particular the economic rent that was expected, should “benefit the entire nation”. The vision and goals for the establishment of an independent Norwegian petroleum administration and industry were expressed in the Storting (the Parliament) in 1972, later known as the “10 oil commandments”:

*“On the basis of the government's principle that a petroleum policy should be developed with a view to exploiting the natural resources on the Norwegian continental shelf in a way which benefits the whole community, the committee would concur that this means:*

- 1. That national management and control must be secured over all operations on the Norwegian continental shelf.*
- 2. That petroleum discoveries are exploited in a way which minimizes Norway's dependence on others for crude oil supplies.*
- 3. That new industrial activities should be developed on the basis of petroleum.*
- 4. That development of an oil industry must take the necessary account of existing industrial operations and of protecting nature and the environment.*

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<sup>14</sup> The Danish state gave, based on the same type of perceptions of lack of resources in Denmark, the rights on her continental shelf and mainland to A.P. Møller in 1963 for 50 years (Hanisch and Nerheim 1992:14, 469).

<sup>15</sup> Hanisch and Nerheim (1992) provide a thorough analysis of the development of the Norwegian petroleum industry in the 1960s and 1970s.

5. *That flaring of usable gas on the Norwegian continental shelf must not be accepted except for brief periods of testing.*
6. *That petroleum from the Norwegian continental shelf must, as a main rule, be landed in Norway with the exception of individual cases where national policy concerns call for a different solution.*
7. *That the state becomes involved at all appropriate levels, and contributes to a coordination of national interests in the Norwegian petroleum industry as well as the creation of an integrated Norwegian petroleum community which sets its sights both nationally and internationally.*
8. *That a state oil company be established to take care of the state's commercial interests and to maintain suitable collaboration with domestic and international petroleum interests.*
9. *That a pattern of activity be selected north of the 62nd parallel [i.e., outside the North Sea] which satisfies the special policy concerns that apply in this region.*
10. *That Norwegian petroleum discoveries on a large scale could add new dimensions to Norway's foreign policy"*

*Source: Stortingsmelding 1971; unofficial translation by the Norwegian Petroleum Directorate (NPD 2000).<sup>16</sup>*

The state's own oil company, Statoil, was established upon this background by a unanimous Parliament decision. It was to be an important actor in developing a national petro-industrial system. The NPD was established as a regulatory body under the Ministry of Industry. Together with the development of international law of the seas since the 1960s, these visions put Norwegian sovereignty in the main seat.

Norwegian authorities had high political ambitions about controlling the industry and the international oil companies. The Norwegian referendum in 1972 not to join the European Economic Community (EEC) reinforced national energy policy efforts. The development was also influenced by the oil crises in 1973/74

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<sup>16</sup> On 14 June 1972, the day before the Norwegian Storting (Parliament) voted to establish the NPD and Statoil, it considered this recommendation on Norwegian petroleum policy. It was written by the standing committee on industry, with Rolf Hellem from the Labor party as its principal architect.

and later in 1979/80. Firstly, the high prices lead to an industry that was far more profitable than previously expected. Secondly, the nationalization of the oil companies and the strong state involvement in member states of Organization of Petroleum Exporting Countries (OPEC) reinforced the national and international acceptance of a strong state involvement. The continued associated membership in the International Energy Agency (IEA) from 1974 showed that Norway as a petroleum producer wanted to play an as independent role as possible within the Western community. This in-between position was later underlined when Norway started a careful inter-relationship with OPEC with the goal of stabilizing oil prices in 1986. Strong state control of production levels and the new industry was a demonstration of national sovereignty, both towards consuming and producing nations.

The Labor party, being the dominant political party after WWII, often placed their own party members in leading positions in the bureaucracy and state owned companies. Minister of Industry Finn Lied made his state secretary and party fellow Arve Johnsen Statoil's first director. Former Minister of Defense and leader of the resistance movement under WWII, Jens Christian Hauge, became the chairman of its board. The MFA was from the start important in making border treaties with countries, such as the United Kingdom and Denmark. Minister and lawyer Jens Evensen, also represented the Labor party, led the State's Oil Council ("Statens oljeråd") from 1965 and the Norwegian delegation in international negotiations about the law of the sea.

Tight links between Statoil, the bureaucracy and the government were established through the Labor party. Statoil was to be the most important instrument for the development of a Norwegian oil industry and a locomotive for the rest of the Norwegian industry. Statoil was to take care of the property owner's (the state's) economic interests on the NCS. Statoil and the system around the company were to be important instruments for the development and control of the entire Norwegian industrial sector (Finn Lied in Statoil Magasin 1983). Hence, oil policy also became nation building. Some even argued that the interests of Statoil were synonymous with Norwegian national interests.

Already in 1972, Statoil was awarded a 50 % partnership in the transmission company Norpipe, established to transport oil from Ekofisk to Teesside in the U.K. and gas from Ekofisk to Emden in Germany. Statoil was given huge shares of the most attractive fields, e.g. 50 % of the Statfjord field in 1973. The company was preferentially treated in several ways. The “carried interest” principle implied that Statoil did not pay the expenses accumulated in the exploration phase.<sup>17</sup> These costs were to be covered by the other licensees. The “gliding scale” principle from 1974 implied that Statoil could increase its share of a license up to 60-80 % when production came on stream.<sup>18</sup> Norwegian companies were preferred as suppliers to the industry. Regional actors were active in promoting their industrial and local interests.

To begin with however, neither the Norwegian state, nor Statoil or other Norwegian companies possessed sufficient competence to develop petroleum activities on their own. Norway needed the assistance of international companies’ competence, and also their capital. Industrial and technological cooperation with the internationals was important (Nore 1979, Noreng 2004). Through access to advanced technology and knowledge, Norwegian companies should after a learning period, become more independent of the internationals. For example, Mobil was replaced by Statoil after 15 years as operator at the Statfjord field in 1987;

*“you cannot learn to drive by sitting in the back seat” (Ask 2006 quoting Statoil head Arve Johnsen when the takeover took place)<sup>19</sup>*

While the oil companies were able to provide ideas and do the practical work, a system was established where the government was to (understand and)

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<sup>17</sup> “Carried interest” is a principle that has some parallels with Production Sharing Agreements (PSAs) for exploration activities; all the risk is taken by the private companies, and the state take part in the process after oil or gas is found. The Storting decided in 1979 that Hydro and the private Norwegian oil company Saga (established in 1972) should not anymore pay for Statoil’s exploration expenses in new concessions. This implied that only foreign companies paid for the carrying of Statoil expenses. From January 1983 this change was also made valid for old licences. Saga petroleum was taken over by Norsk Hydro in 1999, cf. Nore 2003.

<sup>18</sup> In 1992 and 1993 both the carried interest and gliding scale principles were abolished also for foreign companies.

<sup>19</sup> Statoil’s first development project was the Gullfaks field in 1983.

approve all steps on all levels of activity. In order to promote both competition and cooperation, licenses were awarded to a group of companies, rather than to only a single company. Companies were chosen from geological and technological expertise, financial strength and previous experiences. The idea was that they would share ideas and experiences, as well as costs and revenues from the license. Through competition and cooperation the value of each license would be maximized. At the same time, the licensees acted as a controlling system, as each company had an interest in securing that the work of the chosen operator was undertaken in the most cost effective way (MPE annual). All taxes went to the state, except for local property taxes where a terminal was built on land. The Ministry of Finance (FIN) managed to introduce a special tax on petroleum activities to capture most of the rent. Later arrangements with the State's Direct Financial Interests (SDFI) ensured that the entire rent from these shares went to the state.<sup>20</sup>

The establishment phase with a strong state entrepreneurship represented a radical innovation in Schumpeter's terms, cf. Chapter 1.1. It was a mixture between a strong state and private companies, and was different from how the petroleum sector was organized in other countries. From nothing, the state built a new company (Statoil), and protected the Norwegian supply industry in its coupling with international companies. The system of companies, institutions, regulations and politics should provide a "Porterian" type of dynamisms in the national petroleum cluster, making it internationally competitive as soon as possible. The direct interventions went however far beyond Porter type of policy.

The strong state control was in line with the social democratic spirit dominant after WWII, and with the state occupying more roles as owner (Grønlie 1990). The

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<sup>20</sup> The net cash flow (net government take) from the petroleum sector is at present dominated by a 78 % tax on companies' economic profit (28 % general corporate tax + 50 % special tax) and 100 % of net revenues from the SDFI-shares (representing 59 % and 36 % of total net cash flow, respectively, in 2006). In addition, the government receives a dividend from Statoil profits and royalties, area fee and CO<sub>2</sub> tax (4 % and 1 % of the total, respectively, in 2006). The combined net cash flow amounted in the year 2006 to 357 Billion Norwegian kroner, BNOK (some 45 billion euro or 70 billion USD). Under the SDFI arrangement, the state pays its share of investments and costs, and receives a corresponding share of income from a production license. The expenditures are accounted when they occur, so are also revenues (no depreciation). Through the SDFI the state takes all costs and the risk, but also all the economic rent. Typically, the SDFI holds the largest shares in the biggest and most profitable fields.

state had from early in the twentieth century exerted strong control over, for example, hydro-power developments and many other industries considered to be public utilities. However, direct discrimination to the benefit of Norwegian companies was new (Sejersted 2003), whereas previously mainly traditional trade policy instruments (such as tariffs and quotas) were used. The relatively loose international framework for trade at the time, as expressed in the General Agreement on Trade and Tariffs (GATT) and EFTA cooperation, provided an international framework that made it possible to discriminate in favor of Norwegian companies. However, an active state in the build-up of a national industry was also seen in Japan in the 1950s and 1960s through the activities of their Ministry of Industry and Trade (MITI), which introduced measures supporting Japanese industries exposed to competition from abroad, in particular export oriented businesses (Scott 1986). In Sweden the economic position of the Wallenberg family was also partly built on positive discrimination and good-will from the Swedish state (Sejersted 2003).

Public ownership and engagement in the energy sector was not a particularly Norwegian or new phenomenon. Since 1914 a number of states had participated actively in the oil industry as part or full owners of companies (Yergin 1991). In 1970 however, state owned companies represented only 6 per cent of international oil trade (Noreng 2000). The market was dominated by the big international oil companies “the Seven Sisters”; Exxon, Mobil, Chevron, Texaco, Gulf, Royal Dutch Shell and British Petroleum (Sampson 1975). It was acknowledged that this position gave these companies a significant economic, security and foreign policy impact in the countries where they operated (Odell 1986). The nationalization of the petroleum industries in OPEC countries in the 1970s was partly argued for on these grounds, and implied a dramatic increase in state participation in the oil companies in most producing countries.<sup>21</sup> The nationalization made it difficult for the outside world to criticize Norway in building her own national oil company. There was also

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<sup>21</sup> In year 2000 state participation was approximately 70 per cent (Noreng 2000).

*“a long record of oil-consumer governments defending their interests by intervening in the oil industry. The forerunner was the United States with the Sherman Act and the break-up of Standard Oil in 1911” (Noreng 2001:190).*

With the establishment of Statoil, the control mechanisms became however so strong that:

*“the limits for what a capitalist state can do if it wants to remain capitalistic” were approached (Olsen 1989:104, my translation).*

Although state control was essential to the Norwegian model it was different to models of nationalized oil industries, as both Norwegian and international private companies were invited as important partners to acquire capital, competence and technology. The model was as such not an imitation of other countries' practices, but an innovation in itself, combining state control with market principles. The innovative solution in-between complete nationalization (as in most OPEC countries) and more or less free market principles (as in the U.S.) was unique at the time.

National control of a very profitable petroleum industry was important to most oil producing countries through the 1970s and until prices fell in 1985/86. With lower profitability after 1986, however, states became less interested in taking on the associated risk connected with petroleum activity. In many oil producing countries private companies become more important.<sup>22</sup> The lowest oil prices since the first oil price shock in 1973/74 showed how vulnerable the Norwegian oil and gas industry was to changes in this one single variable. There were also fewer large known fields to be developed on the NCS, which brought unit costs up. The strong national control appeared as more difficult when big fields no longer dominated development activity, and oil prices and profitability were noticeably low.

Technological developments and the need for pressing costs renewed the interest in cooperation with international oil companies after the strong nationalization period. The big Condeep platforms from the 1970s and 1980s

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<sup>22</sup> With the high oil prices after 2001, this trend has again been reversed. Examples are stronger political control of the Russian oil industry, and the nationalization of (or stronger national control with) the industries in Bolivia and Venezuela.

became out of date and too expensive. It was discussions, *inter alia*, between Statoil and Hydro about new solutions. The costs on the NCS were higher than on the British shelf. Developments were moving towards more flexible and cheaper floating installations, sub-sea technology, horizontal drilling and gradually sub-sea installations.

The new situation changed the political entrepreneurship. Lower profit margins made companies stronger in relation to the state, but the situation also showed more clearly than before that the state and the companies had many interests in common. A general understanding of the need for more foreign technological competence evolved (Ryggvik 1997:61-62). The Norwegization policy led to employment, growth and competence in Norwegian companies and regions (Olsen and Reiersen 1991:9-20). However, the lower profit margins weakened the state's power to require that the companies should also satisfy national (industrial policy) goals (Nerheim 1996).

On the other hand, it was difficult to lower costs in the short run. Investments were irreversible, organizations slow to change and political parties (or interest groups) resisted (Engen 2002:158-201). Consequently, the industrial structural of the early 1990s looked much like the one from the 1970s and 1980s. However, the change in prices and the need for new production methods led to the search for new technological concepts and organizational models, new attitudes and new roles for politics and industry, both in and among the oil companies and in state agencies. Many of the solutions required more than the efforts of single companies. The government again took on the role of catalyst and coordinator in what from 1993 was known as the NORSOK (Norwegian shelf competitive position) cooperation.

The content of the entrepreneurial role this time was to release and accommodate for industrial solutions in accordance with the interests of the state, oil and gas companies, the supply industry and the trade unions. NORSOK contributed to the introduction of new technology and organizational models. However, the process lost gradually much of its momentum (*ibid*:291-311). The relations between the supply industry and the oil companies had changed. The supply industry increasingly took on sub-entreprises in projects, in contrast to the

early phase when the oil companies controlled most of the details. The national enterprise, with Statoil in the main seat, was changed. The state took on a more coordinating role towards the industry, and the oil companies became the main entrepreneurs for field developments and operations, while the supply industry increasingly became larger sub-entrepreneurs.

The coupling between structural changes in the petroleum industry, the changed role and maturity of Statoil and the establishment of the petroleum fund (cf. Chapter 2.4) is important in understanding the depoliticization of policy making in petroleum policy and adjusting to an increasingly more liberal economic international world. Hence, the depoliticization of the role of Statoil came gradually before its privatization in 2001. Harald Norvik who took over as head of the company after Arve Johnsen in 1987 was also a former state secretary for the Labor party. By bringing persons from the political into the industrial sphere (cf. Barth 1962), competence was more easily exchanged and the tight links established from the start were reinforced. With the alliance with British Petroleum (BP) in 1989 Norvik started to internationalize the company in countries like Angola and Azerbaijan. Technological change and international expansion should now gradually bring progress for the company, more than domestic developments. From the start Norvik wanted to partly privatize the company (Ask 2006). He considered that Statoil had to become a publicly traded company to get the same working conditions as its competitors (Lerøen 2002). After his resignation in 1999, as a result of the Åsgard excess costs, Norvik was able to wish Statoil welcome to the Norwegian “center of capitalism”, Oslo stock exchange, as its chairman in 2002.

His successor Olav Fjeld had no political background, although he had experience from state companies. Statoil expressed now no official political opinions, for example on whether EU rules had any impact on Norwegian energy policy (Ask 2006). Cost control was however still inadequate. In the Snow-white project costs were exceeded by 50 % compared to the budget, and are as of 2008 still not fully operative. With the conservative politician Helge Lund as another new head of Statoil, after Fjeld had to resign after the Iran scandal in 2003, the role of Statoil as a state entrepreneurial instrument was considerably reduced. As with Statoil privatization, it was the company itself in 2006 that

together with Hydro suggested their merger of 2007, and not the government.<sup>23</sup> This time it was undertaken in an alliance with former minister of the MPE for the Norwegian Center Party and head of Norsk Hydro, Eivind Reiten. The coupling between spheres continued, but now between the industry and parties other than Labor. Statoil was to carry on with what had become an industrial intrapreneurship for the company, with the goal of becoming a strong international oil company. The state was to take the back seat as the biggest owner, but with the opportunity to intervene in decisions, if it was willing and considered it necessary.

## 2.2 Statoil as political instrument

The 10 oil commandments from 1972 were concerned with national control of the petroleum sector and the building of a national oil industry. The most specific commandment related to Statoil was no. 8:

*“That a state oil company be established to take care of the state's commercial interests and to maintain suitable collaboration with domestic and international petroleum interests”.*

The company was to support the state in the realization of the other 9 commandments. The establishment of Statoil was the most important single instrument used by the state to ensure that oil activities “benefit the whole nation”.

With large oil revenues and national control over the industry the establishment of Statoil was by many considered an industrial success during the 1970s and the early 1980s, not least from a pro-state perspective (Claes 2002a). However, skepticism about the dominant role of the company gradually emerged. When oil revenues rose substantially after the second oil shock in 1979/80, the net cash flow of the company became extremely large. The company had incentives to increase activity (and costs) in order to prevent transfer of taxes

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<sup>23</sup> Ramm (2009) however claims that: “In 2006, PM Jens Stoltenberg admitted that he had been working for a Statoil/Hydro merger for many years, even before he became Prime Minister in 2000. He said he as MPE Minister from 1993 had learned ‘that political limitations are obstacles for good solutions. Long after it was obvious that we had a lot to gain by reducing the number of companies to achieve more strength, the political community said no.’”

to the state as its owner and create its own autonomy (Richardson 1981). It was also opposition against the dominant role of the Labor party over oil policy, and that Statoil could be a young cuckoo dominating policy, rather than the other way around (Osmundsen 1981).

*“The civil service was from the first moment aware of the powerful position Statoil would come into” (Ramm 2009).*

Even though Statoil was expected to operate within political imperatives made by the government, Statoil had its own ambitions and sought to influence political debate (Grayson 1981). Statoil’s significance as an industrial locomotive was also challenged, where the liberal parties wanted a more diversified industry, and bigger shares of blocks to Hydro and Saga.

After the general election in 1981, power was transferred from the Labor party in the direction of parties on the liberal side. It was the Conservative Party leader Kåre Willoch’s (Høyre) two subsequent governments (1981-83 and 1983-86) that exercised the first pressure to reduce the influence of Statoil. The definition of a “national interest” was modified. However, even though the model changed it did not reduce the role of the state. The “Statoil compromise” in 1984 “cut the wings” of the company. The aim was to prevent Statoil from growing too big and exercising too much political influence (Willoch 1990:289). The shares they owned in the licenses were divided in two, one to Statoil (some 20 %) and the (larger) rest to the state through the establishment of the SDFI. The SDFI was to administer the state’s direct ownership of licenses on the NCS. Investment and operational costs in the SDFI were paid directly over the state budget, and revenues equivalently accounted, cf. Footnote 20. The consequence was that the state had huge expenses in the investment phase of a field, and in due course huge revenues when they were completed. This was because investments were accounted for when they occurred and not depreciated (a “cash principle”). With the new system the state took the largest single part of the financial risk for field developments, the entire economic rent from their part of a license, as well as an equivalent possible loss.

The immediate effects of the wing clippings were not very dramatic for Statoil. The company remained responsible for the operation and financial

management of the SDFIs. The significant Statfjord field, already in production, was exempted from the SDFI arrangement, and this helped Statoil maintain a significant cash flow for several years. The arrangement indicated that it was the government, and not Statoil, that took on the greatest expenses when developing big fields like Oseberg, Gullfaks and Troll. As entrepreneurial risk-taker the Norwegian state took much of the financial costs involved in realizing these projects. The state's net cash flow became actually close to zero in the late 1980s, because of the SDFI expenses and low oil prices. The cash flow for Statoil was less reduced in the short and medium term. The wing clippings indicated nevertheless, a direction where the company might become less dominant, in relative terms, and that a different role for the state's control of the sector might gradually take shape. The emergence of and increased political preference for Hydro and Saga also reduced Statoil's relative influence.

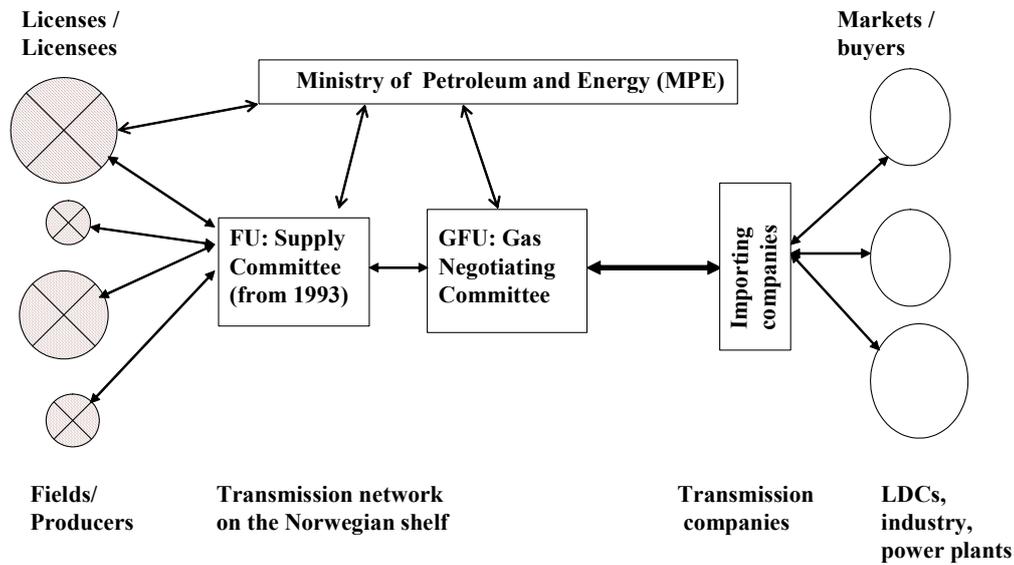
The Mongstad scandal in 1987-88 contributed further to changing the role of the company. With the Mongstad plant, Statoil entered into the refining of crude oil and land based industry. It also established a nation wide gas station system. The problems around Mongstad were in the aftermath explained in terms of poor projecting, technical misjudgments and weak project management. The preferential position occupied by Statoil was by many considered to have lead to bad cost control (X-inefficiency). The heads of Statoil were accused of being unable to deal with the situation, and of having withheld information to the MPE. Statoil's COB at the time, Inge Johansen, and acting entrepreneur from the start, Arve Johnsen, were forced to resign. The final cost was 6 billion Norwegian kroner (NOK) above the original budget (in Norwegian often called "one Mong"). The phrase "scandal" may in many senses however over-exaggerate what can be considered a normal consequence of the state's substantial entrepreneurial risk-taking in the development of Statoil and the oil and gas industry.

Statoil was however assigned the position as leader of the newly established GFU in 1986, but had to share responsibility with the two other Norwegian companies, Hydro and Saga. In the early 1970s, each gas field was sold as one by the respective owners ("depletion" or "field" contracts from Ekofisk and Frigg). From 1977, Statoil negotiated alone on behalf of the licensees (Statfjord, Heimdal,

Gullfaks, Sleipner and Troll). The GFU gained from 1986 responsibility for selling all Norwegian gas independently of who owned it. The purpose of centralized gas sales was to maintain a strong market position in relation to European buyers who had organized themselves as a monopsony. In this phase the big transmission companies on the Continent (such as Ruhrgas, Gasunie, and Gaz de France) collaborated as buyers ("the consortium"). To prevent these companies (through their owners) sitting on both sides of the table in gas negotiations, foreign companies were not allowed to participate in the GFU, cf. the discussion of the three stages of developments of a gas market in Chapter 4.1. The view was that competition between companies operating on the NCS would lead to increased supply and a pressure towards lower gas prices. As the leader of the GFU, Statoil remained in a strong bargaining position vis-à-vis foreign buyers, but Hydro and Saga also increased their influence, and the MPE obtained more direct insight into and control of negotiations.

A Supply Committee (FU) was in addition established in 1993, as a counseling body for the MPE, this time with foreign companies as participants. The FU evaluated developments in individual fields and considered which fields should supply each contract. The FU's goal was to secure the exploitation of scope economies (cf. Chapter 5.5) and optimal resource management (cf. Chapter 5.4) across fields, and between oil and gas production. The MPE was to make the final decision concerning whether a gas contract was to be ratified, and which fields were to supply the contract ("supply contracts"). Together, the GFU /FU system, SDFI ownership and Statoil, all under the control of the MPE, represented the NGF and were national policy instruments making it possible to achieve lower costs through economies of scope, better resource management and a strengthened market position for Norwegian gas production and its sale.

Figure 2.1: The organization of Norwegian gas sales 1986 – 2001.



Under these arrangements (cf. Figure 2.1), the Norwegian state (MPE) directly intervened in decisions about gas sales and production. Statoil continued to play an important role, but government control became stronger.<sup>24</sup> It was not only as regulator that the MPE exercised power over the industry, but also through direct ownership of fields and companies. The biggest resource owner on the NCS was / is the SDFI (between 30 and 63 per cent of the biggest fields), followed by state owned Statoil and partly state owned Hydro with 9-20 per cent of the fields. Together, the three (with the StatoilHydro merger: two) dominated and continue to dominate NCS activity with a combined share of some 70 per cent of fields in production. Equivalent ownership concentrations are found in the most important transmission systems and terminals for natural gas (MPE annual).

To what extent did the establishment and development of Statoil contribute to the fulfillment of the 10 oil commandments? No doubt, the company was established (commandment no. 8). It contributed to the development of a Norwegian supply industry and new economic activity (commandments no. 3 and 7). The Norwegian petroleum cluster, Statoil included, is now in the

<sup>24</sup> The MPE also took responsibility in important environmental, as well as in some foreign policy questions, such as relations to OPEC, IEA, and the EU, and in the negotiations of the Energy Charter (still not ratified by Norway).

international front in offshore developments. Oil and gas is mainly landed in Norway (commandment no. 6).<sup>25</sup> Norway has for a long time been independent of other countries in its own consumption of oil (commandment no. 2).

Concerning national control (commandment no. 1) there has for a long time been a fear that Statoil would gain too much power within the industry, as well as in the country. In spite of the wing clippings in 1984, and increased direct state control in the gas sector and privatization, these questions continue to be debated. Privatization made the company more free in its business decisions. It was Statoil's own initiative to become partly privatized in 2001 (see however Footnote 23). Its main arguments were that the company had become a mature enterprise, and that it wanted to grow more internationally than domestically (see also Footnote 37 and Chapter 3.2). Europeization and globalization of the international economy, liberal economic trends and the EEA agreement were other important factors.

However, private economic considerations can be more short-sighted than national priorities, and the challenges are also a question of democratic developments. If the government does not using its majority stake in the company to lead decisions when private and social interest conflict, there is a risk that the company will lead the government in petroleum policy formulation, as well as in other questions.<sup>26</sup> The merger with Hydro oil and gas in 2007 will make such a challenge a distinct possibility. In preparation for such a course of events, the state might seek to reinforce its competence over petroleum policy and its effects on society to balance the influence of the (new) large company when defending national interests.<sup>27</sup> The young cuckoo has definitely become an adult and privatized out of the nest. The need for strong state policy remains if the 10

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<sup>25</sup> Ekofisk is the main exemption.

<sup>26</sup> For example, the petroleum tax regime could be put under pressure.

<sup>27</sup> Refvem (2007) is expressing strong concerns about the merger. Osmundsen (2007) is discussing negative impact for competition on the NCS activity. Former CEO Arve Johnsen stressed this point in an interview on February 1, 2004: *"The fantastic development of the Norwegian oil industry has been due to the competition between various oil companies with different cultures. [Its] success rests on world class technological innovations encouraged by competition"* (cited in Ramm 2009).

Commandments shall continue to be defended, but the challenges have become quite different, as compared with the 1970s and 1980s.

### **2.3 Exogenous change and Norwegian gas policy in the 1980s**

Due to her (potential) production levels, market shares and the geographical localization of resources Norwegian gas was at an early point involved in international economic conflicts of interests and political currents. The intrinsic value of gas and its importance for the growth of modern societies are reasons that natural gas (and oil) delivery and transportation systems easily become focal points in conflicts. For the European market, much gas is found in a relatively small number of large fields (increasingly more) far from consumer areas. Large-scale operations are important to realize investments in bringing gas to the market. The advantages of economies of scale and scope and vertical integration imply that few companies operate as gas sellers and transporters. This links selling, transmission and purchasing countries commercially and politically together over longer periods of time, cf. Chapter 4.1. The importance of these factors became especially relevant for the European Community's (EC) gas market in the 1980s as the entire growth had to be covered by international trade, mostly between the EC and non-EC countries.

The first significant external political challenges to Norwegian gas policy came in the early 1980s, when Norwegian gas exports were considered to face remarkable prospects. Unrest in the Middle East and the tripling of oil prices in 1979/80 raised European energy consuming nations' attention towards gas as a replacement for oil in their energy portfolio. Also, Dutch and British gas production was expected to be on decline and had to be replaced. The Cold War situation with the Soviet Union put political limitations on how much gas could be imported from the Russians. It was perceived as another "risky" petroleum source, alongside the Middle East. The situation led to competition between Continental and British buyers in their desire to purchase Norwegian gas.

This was an attractive situation for Norway. Statoil concluded a deal in 1980 with the West German company Gelsenberg, for a smaller volume of gas on a

parity with crude oil prices; nominal \$5.67 per Million British thermal units (MMBTU) equivalent to \$32 per barrel of oil (Aftenposten July 10, 1980). An additional deal was agreed with Gelsenberg that they would also buy Statfjord gas on similar terms. However, after internal German discussions Gelsenberg was replaced by the Continental consortium of gas companies headed by Ruhrgas. At first this did not change the terms of the Norwegian contracts. When the Statfjord contract eventually was signed with the consortium later in 1980, the price was set to \$5.50 per MMBTU. The crude oil parity prices were the highest ever reached on a world wide basis (Estrada, Bergesen, Moe and Sydnes 1988:215). Normally, prices were set below crude oil parity in order to penetrate markets, cf. Chapter 4.4.

The perspective that these contracts would set the new standard for gas contracts was well established in Norway at the time;

*“Norwegian gas will never be inexpensive gas. It will command a premium price partly because of high costs, partly because deliveries are based on long term agreements from a stable area” (Johnsen 1983).*

This kind of economic and political argument by the head of Statoil was heavily grounded in a seller’s understanding of the market and the political situation. There would be no reason for Norway to increase gas production if profits were not increased, as compared to existing expectations.

The preference for Norway as a gas seller was surprisingly supported by an event resulting from the Cold War situation. In order to prevent Western European countries from completing a notable gas contract with the Soviet Union in 1982, the U.S. introduced a ban on all American exports to firms supporting the project. The U.S. also boycotted European firms supplying equipment. President Reagan claimed that if Western Europe became too dependent on Soviet gas, there was a risk of pressure in a future political crisis if the Soviets turned off the taps to stop energy supplies. The U.S. urged Norway to increase her gas exports as a substitute for Soviet gas.<sup>28</sup>

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<sup>28</sup> For further details about this conflict see Jentleson (1986) and Austvik (1991:102-120).

After having sold the Statfjord gas, Norway also negotiated from 1982 an 11-15 Billion Cubic Meters (BCM) contract from the Sleipner field with British Gas (BG) for the period 1991-2010. With the American embargo, and negotiations going on with the British to sell Sleipner gas at high prices, the perception of being a preferred gas exporter in a seller's market was underlined as realistic in commercial and political circles in Norway.

James Allcock, at the time purchasing director in BG disapproved however of the high price demands from Norway, so much that he asked whether or not "gold dust parity" would be the next claim (Refvem 2002). Algerian Sonatrach tried to pursue the same principles without much success. The high price policy was pursued until the fall of the Willoch government in 1986, without the signing of any gas contracts of significance. In addition to requiring a price premium on Norwegian gas compared to earlier, an "oil-option" policy was formulated in case buyers would not accept the terms (Austvik 1987a). This policy stated that Norway preferred the production and selling of oil rather than gas, if high gas prices were not accepted.

The situation changed with weaker energy markets and diverging views among consuming nations about the political situation. The U.S. embargo of Soviet pipeline equipment was cancelled already in late 1982, but the American support for Norway as a preferred supplier remained. Politically, it was the British rejection of the Sleipner deal that turned the Norwegian picture upside down. After the commercial Sleipner partners agreed on terms in early 1984, the plan was supported by the British Department of Energy with minor changes. The Thatcher government however, rejected the whole deal in 1985, primarily for financial and industrial reasons.<sup>29</sup> With the British government's rejection of the Sleipner deal, the UK could not for a longer period be considered a growing market for Norwegian gas. Thus, the only alternative to selling Troll gas to the Continent was to delay production.

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<sup>29</sup> See also the discussion of U.K. natural gas developments in Chapter 5.5.6.2. For more details about the Sleipner process, see Stern (1986), Estrada, Bergesen, Moe and Sydnes (1988:215-220), Bartch (1999:210-212).

When the second government under Gro Harlem Brundtland (1986-89) adopted a form of market pricing in 1986, the Troll negotiations were eventually speeded up. The Troll agreement signaled a change in strategy adapted to a more realistic view on market and political situations. Now gas had to be sold on commercial terms at prices lower than its alternatives, including a downward revision of the terms for Statfjord gas sold in 1980. The Norwegian negotiating position was considerably weakened, and the final terms for the Troll contracts in 1986 marked a decisive step away from the price premium and oil-option policy.<sup>30</sup>

When entering the 1990s and EU integration processes, Norwegian gas policy was nevertheless still strongly politically controlled, in spite of the changed economic and political surroundings. As political entrepreneur, the state took responsibility for responding to exogenous changes in the 1980s. The MPE gained a strong direct hand on gas policy through the establishment of the GFU and later through FU arrangements, partly at Statoil's expense. The goals of controlling the industry, proper resource management and rent capturing were maintained. Exogenous change and pressures on domestic policy, led eventually to a policy change better adjusted to political and market realities than in the early 1980s.

## **2.4 Petroleum fund and production levels**

An important problem in the entire period when the oil and gas industry was built was that the focus on non-petro industries was weakened. This challenge was not mentioned in the 10 oil commandments from 1972. However, the Petroleum report to the parliament in 1974 (Stortingsmelding nr. 25 / 1974: "Petroleumsmeldingen") set up the goal that petro-money should be used to build a "qualitatively better society". New social reforms were to be carried out, regional developments were to be prioritized and culture emphasized. In 1975, the Parliament decided upon an escalation plan for the agricultural sector in order to bring farmers' income up to the level of an industrial worker. Advanced

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<sup>30</sup> Views may diverge about what should have been the aim of Norwegian strategy in these years when there were remarkable prospects for gas contracting. Even though higher prices in new contracts was one option, with an implicit increase in volume, Norwegian interests might also have been promoted through more modest demands, such as price guarantees and securing access to the markets when they again become weak, cf. also Chapter 5.4.3.

income from the petro sector was used to help industries through difficult times, in response to a weak international economic situation.

This situation was mainly caused by the first oil shock and the Vietnam War. The economic policy (“Motkonjunkturpolitikken”) to counter-act this was introduced by Minister of Finance Per Kleppe (also the Labor party) in the 1970s. It aimed to avoid decline in overall domestic production and employment. Domestic consumption was maintained through expansive budgets financed by borrowing abroad. Paying-back would take place with the arrival of the large anticipated petroleum revenues in the 1980s. In 1979, total debt had reached some nominal 104 BNOK. 2/3 of this was however caused by investments on the NCS and in the shipping industry. This policy was therefore also important in maintaining continuity in the development of the Norwegian petroleum system.

The resultant price pressure from these investments combined with the expansive public budgets led to a cost pressure for non-oil export and import competing industries. The demand stimulus from public spending generated wage increases for industry. While the NOK weakened compared to U.S. dollars, it was strengthened towards European currencies. This was partly caused by the oil companies buying NOK when they were to pay their taxes to the Norwegian government. The large current account surpluses in the early 1980s after the second oil shock put additional pressure on industry. The so-called “Willoch Doctrine” of December 11, 1981 expressed such a strong concern over the wage spiral in the oil sector that it explicitly stated that there would be “consequences for the oil companies”, if they did not manage to keep down wages. The doctrine changed relations between oil companies, trade unions and the state. An alliance between the state and the trade unions was created. This has since characterized Norwegian petroleum activities (Ryggvik and Smith-Solbakken 1997:271).

A belief in further growth in petroleum revenues were at the time shared world-wide (Lynch 1992). Oil revenues made both the Norwegian government and society forget that important parts of non-petro industries had lost much of their competitive positions. Oil money paid for low unemployment and more

welfare goods. Norway experienced a light “Dutch Disease”, and that the significant emphasis on the petroleum sector also had its dangerous sides.<sup>31</sup>

A relatively careful attitude towards the management of petroleum resources, coupled with concerns over the macroeconomic effects of the sector, led in the 1970s to a decision that production should be limited to between 50 and 90 million tones of oil equivalents (mtoe) per year. This regulative measure on production was replaced by a regulation of investments in 1983 (“Tempoutvalget”).<sup>32</sup> However, none of the measures were part of any unified plan for production levels and the management of oil and gas revenues. Instead they were an expression of a lack of government control (Noreng 1984).

The dramatic drop in oil prices in 1986 showed that the oil sector was not only filled with money and opportunities, but also great risk. The drop in oil prices was connected with another dramatic drop in the dollar exchange rate. This reinforced the losses measured in Norwegian currency (Austvik 1987b). The state, through the SDFI, a strong taxation system and ownership in Statoil, took most of

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<sup>31</sup> The term Dutch Disease was used first time in an article in *The Economist* (“The Dutch Disease” 28 nov. 1978:82-83). It was soon established as the diagnosis on the problems a country can get from domestic use of petroleum revenues. Holland had significant revenues from gas exports since the 1960s. The growth in welfare goods was financed by increased government income from gas production. The value of the Dutch Gulden appreciated towards trading partners’ currencies. As gas export revenues levelled out, public finances ran increasingly higher deficits and it was necessary to raise taxes. High real wage increases and strong inflation weakened the competitive position of traditional industries. The weak international economic situation in the 1970s and 1980s showed that important parts of Dutch industry were not able to compete. Imports and unemployment increased. In this way the Dutch gas exports competed out non-gas industries through their ability to pay more for people and resources. In addition public budgets were based on a petroleum rent not created as part of domestic production.

The term Dutch Disease is however not only used for the challenges of petroleum exporting countries, and the problem it describes is not new:

*“Although the disease is generally associated with a natural resource discovery, it can occur from any development that results in a large inflow of foreign currency, including a sharp surge in natural resource prices, foreign assistance, and foreign direct investment. Economists have used the Dutch disease model to examine such episodes, including the impact of the flow of American treasures into sixteenth-century Spain and gold discoveries in Australia in the 1850s.” (Ebrahim-Zadeh 2003).*

For more discussions about the Dutch Disease, see Corden and Neary (1982), Krugman (1987), Gylfason, Herbertsson and Zoega (1999), Ollus and Barisitz (2007), Van Wijnbergen (1984). See also Footnote 85 about the resource curse paradox.

<sup>32</sup> Already in 1988, this principle was deviated politically when the development of the Snorre field was approved.

the losses when prices fell, even though companies also lost. Macroeconomic experiences from the 1970s and 1980s initiated a discussion about establishing a fund to split oil money earnings from expenditures. The idea was to transfer resources from the NCS to international financial markets, which would give a higher and more stable yield over time. This was in line with the Hotelling rule (1931), cf. Chapter 5.4.1, to protect the economy from boost and boom cycles, and to make use of income in a more smooth and long-term (and over generations) manner.

The Petroleum Fund was established in 1991 and the first deposits were made in 1995. The fund ensured that annual public budgets were no longer directly influenced by fluctuations in oil and gas revenues. What was not used of revenues was to be accumulated in the fund. When petro revenues were not changed into NOK, the pressure for an appreciation of the currency was strongly weakened, and domestic demand would be kept under control. The fund is administered in a separate section of the Central Bank (NBIM = Norges Bank Investment Management), and the Parliament decides upon how much of it should be used in the annual budgets.<sup>33</sup>

The fund had however also significant effect on oil and gas production policy. Not only earnings and expenditures were decoupled, but also activity level on the NCS and macroeconomic concerns, despite the impact from the huge oil and gas investments in themselves on the Norwegian economy. FIN had a strong constraining role on production levels in the 1970s, but has in public not said much on the issue after the fund was established. Combined oil and gas production reached some 250 mtoe in 2007; 3-4 times higher than the ceiling put up in the 1970s. Only resources now seem to limit production growth. While oil production peaked in 2004 for this reason, gas production is growing to 120 BCM,

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<sup>33</sup> There appears to be a consensus across party lines that the amount of petro money to be used in the economy should not contribute to increased inflation, and hence, avoiding Dutch Disease problems. There is however disagreement, especially from the Progress Party, on how much money the economy can absorb without creating such problems. With high oil prices and following high government revenues after 2001, the size of the Fund has increased dramatically, and the return on investments is becoming increasingly more important compared to the level of oil revenues deposited. The Fund exceeded 2000 BNOK (some 230 billion euro or 400 billion USD) by the end of 2007 and is expected to continue increasing at a fast rate, if the high oil prices persist.

and possibly beyond this level in coming years. Eventually, gas production will however also peak.

How the fund is eventually to be used “to the best for the society” (according to the 10 Oil Commandments) is however still unclear, in spite of renaming as a pension fund (from 2006 it is formally called the Government Pension Fund – Global).<sup>34</sup> Significant efforts have been made to ensure against its misuse, such as the 4 per cent Fiscal Rule (“*Handlingsregelen*”). If maintained, this implies a gradual increased usage of petro money in the economy.<sup>35</sup>

After the successful build-up of the petroleum sector the state should as a consequence be increasingly concerned with the macroeconomic and social long term aspects for the country, and dealing with the huge sums accumulating in the Petroleum Fund. The ownership and direct participation in the activities, together with a strong taxation system, has meant that most of the economic rent has been given to the state, cf. Chapter 2.1. Norway has done quite well in protecting the economy from “Dutch Disease” problems by creating the Fund. There is little controversy (although not zero) in Norway about the model – most people are

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<sup>34</sup> The Norwegian Petroleum Fund is considered a Sovereign Wealth Fund (SWF). A SWF is a state-owned fund composed of financial assets such as stocks, bonds, property or other financial instruments. Most of the savings of SWFs originate in accumulated foreign currency reserves. SWFs are typically created when governments have budgetary surpluses and little or no international debt. The Japanese Pension Fund was the largest pension fund by the end of 2007 with some 1200 Billion USD when domestic investments are included. Abu Dhabi Investment Authority (ADIA) with some 700 Billion USD was the largest SWF in 2007 and is mainly invested abroad, followed by the Norwegian Fund with some 400 Billion USD (Baumbusch 2008, Newton 2008).

<sup>35</sup> At present, all government net cash flow, cf. Footnote 20, from the petroleum sector goes into the fund and is saved together with the return on the investments, which are entirely made abroad. The fund has invested in 40 % shares and 60 % bonds according to specifications from FIN. This is considered to change to 60 % shares and 40 % bonds due to the expected higher long-term yields on shares than on bonds. Property investments are now also considered. As the Fund grows, the yield on investments will grow in importance compared to the net cash flow from petroleum production.

Norwegian fiscal policy is however anchored to the guideline that over time the structural non-oil budget deficit is to correspond to the real return on the Fund, estimated at 4 % per annum (the “4 per cent Fiscal Rule”). In this way public and private spending is made independent of petro revenues. The 4-per cent rule is however, not linked to the economic situation at any one time, but to a long-term usage of the petroleum wealth. Under present Norwegian macroeconomic regime, monetary policy might be used to regulate economic activity.

content to have a professional petroleum industry, a healthy fund and political control.<sup>36</sup>

The radical innovative step of the state in establishing the Petroleum Fund was obviously wise from a macroeconomic and financial point of view. Without the fund, production increases making Norway the third biggest combined oil and gas exporter in the world (after Russia and Saudi Arabia) for a long period would have been most difficult from a macroeconomic point of view, and would most likely have been resisted by the FIN. The removal of production restraints increased the domestic maneuvering room for the natural gas entrepreneur, as well as for consuming countries that were able to pressure Norway for higher production. This implies that the Win-Set for Norway has expanded in such situations, cf. Chapter 1.6; and it is more difficult for Norway to reject pressures for increased production if she has available resources.

## **2.5 Exogenous change caused by integration with the EU**

The first adjustment of Norwegian petroleum policy to EU regulations came in the early 1990s, when the EEA agreement challenged established preferential arrangements for Norwegian supplies to the sector, as discussed in more detail in Chapter 3. At the time, however, most of the supply industry had become competitive and the industry itself did not any longer consider continued protection an important issue. Access to markets in other countries was considered more important. The EU Concession Directive (EU 1994) coming with the EEA agreement, appeared eventually as rather uncontroversial for the industry. However, it provided a signal that the EU had become an important force in Norwegian petroleum policy formation. The EU represented a new, and primarily exogenous, force influencing Norwegian petroleum policy, cf. Chapter

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<sup>36</sup> Growing concerns can however be seen on the horizon. How large should the fund become? Should perhaps more oil be left in the ground? Will Norwegian politicians remain "reasonable" forever, or will the size of the fund create new political waves among those who would like to use more money? Should money be used to upgrade the society, more so than has been the case? By investing in future capacity at home, especially infrastructure, (roads, rail, education, research, culture) new economic bases would be created and the dependency on Petroleum Fund would decrease. "Easy come may easy go".

1.5. National policy now had to be made according to EU rules and their interpretation by the ESA.

The liberalization of the European gas market, as outlined in Chapter 4.1 and 4.6, was partly caused by a larger market and the building of substantial infrastructures in transmission, distribution and storage, and not only by EU and EU countries regulations and policies. By establishing downstream competition, the EU wanted to reinforce the speed of these processes and to push gas prices down. The gas directive (EU 1998) introduced in 2002 and revised in 2003 (EU 2003a), were political decisions on the way towards a more liberal market. However, they were relatively far from completely liberalizing the market, cf. Chapter 4.8 and Chapter 5.

The gas directive was considered far more important than the Concession Directive as it threatened the structure of the Norwegian petroleum organization (Stern 1998:164-170). The changes following Norway's formal EEA agreement became especially significant for Norwegian gas entrepreneurship, cf. Chapter 3.2. The EU argued that the EEA agreement made the Directive relevant for pipelines on the NCS, and that Norway should open for TPA on the NCS. This was for a long time resisted by Norway.

In addition to the pressure from the gas directive, the ESA examined legal aspects concerning the GFU arrangement on EU competition law. After long discussions and threats, including a Statement of objection (SO) from the EU Commission on June 8, 2001 saying tentatively that purchasers should be free

*"to remain committed to the existing contracts, to terminate these contracts or to renegotiate the terms thereof",*

and fines in the range of 40-50 billion NOK, the Norwegian government decided to terminate the GFU-FU arrangements for gas production and sales in 2001. Each licensee should now sell their own gas. However, in spite of the Norwegian acceptance, the EU maintained for a long time it's SO saying that all old (long term) contracts were signed on an illegal basis.

After a long round of new discussions Norway also accepted that the gas directive should be applied to offshore pipelines on NCS. Only then did the EU

abandon its SO (EU 2002). A TPA system was to be established on the NCS, and contracts were to be made directly between individual producers and purchasers in the market. However, neither a “federal” regulatory authority on EU level, nor common rules for TPA was introduced. The imperfections in EU market liberalization efforts provided maneuvering room for the formulation of terms for Norwegian transportation systems, cf. Chapter 3.4.

Statoil’s privatization took place at the same time as EU demands, and was adjusted to these. With privatization, the company could no longer take care of the same functions for the government as before. Privatization required a clearer definition of the role of the state in taking care of its own interests, and new ways off promoting efficiency, distribution, and political and social aspects of petroleum activities in line with EU rules and practices.

To take care of the SDFI the new fully owned state company *Petoro* was created. The company assumed responsibility for administering the ownership interests of the state, monitoring Statoil’s production and sales activities and doing the accounts for the SDFI. In order to secure an open access for transportation of gas on the NCS, the new fully state owned company *Gassco* was established. Gassco took Statoil’s role as operator for transmission systems to the Continent and the U.K. These systems had different tariff practices and were organized as separate companies, where each could deny third parties’ access to their systems. The *Gassled* system introduced offered in principle equal tariffs for everyone using the system, as an adjustment to the EU gas directive (MPE 2002), cf. Chapter 3.4.<sup>37</sup>

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<sup>37</sup> Partial privatization of Statoil involved changes in the state's role and decision-making authority towards the company. The provisions of the Public Limited Companies Act apply in full, and the special rules governing state-owned limited companies were no longer relevant. As the majority shareholder, however, the government retained great influence – not least in relation to the company's articles of association. The prospectus for Statoil's initial public offering stated that the government indicated that it – as one of many shareholders – will concentrate on issues relating to the return on capital and dividend, with the emphasis on long-term development of profitable operations and value creation for shareholders.

The restructuring of state participation in the petroleum sector included the sale of SDFI assets corresponding to 15 per cent of the portfolio's value to Statoil. The sale of a further 6.5 per cent to companies other than Statoil was completed in March 2002. Statoil previously provided commercial management for the SDFI. This arrangement reflected Statoil's status as a wholly state-owned limited company, which gave the government opportunities for management and control of the SDFI in accordance with constitutional requirements for

Within this new framework the Norwegian government showed high competence in giving the Norwegian structure a new form, while at the same time maintaining control, as outlined in Chapter 3.5-6. The new tariff system was not too different from the old one. With rather high upstream tariffs (between fields and terminals), the possibility of oversupply in weak market situations should be dampened. With the state as the single owner of the SDFI, and main shareholder in Statoil and Hydro, the risk of oversupply in such situations should be further reduced. That each licensee should no longer sell their gas through the GFU was in many cases already accepted. If it had not been abolished, the GFU arrangement would have needed modification. The negotiating position towards the buyers was weakened, but not in a fundamental way. Markets had also become more open than before, on the positive side, as seen from a Norwegian perspective.

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managing state property and organizing commercial state operations. The changes in 2001 split Statoil's role as a company responsible for the government's interests in the purchase and transportation of oil and gas and its role as a commercial company. The two new companies, Petoro and Gassco, were established to take care of this:

Established on 9 May 2001, *Petoro* was organized as a wholly state-owned limited company and based in Stavanger. Due to have about 60 employees, it has three duties: a) managing the state's interests in partnerships where such interests are held at any given time; b) Monitoring Statoil's sale of oil and gas produced for the SDFI (Statoil shall so far continue to sell SDFI/Petoro's oil and gas); and c) keeping accounts for the SDFI. The company's operations should be confined to the NCS, and it shall have no international interests of its own. It shall not apply for new production licenses or be awarded operatorships. It cannot sell, swap or buy license interests, but can advice on such transactions. Its duties will be confined to managing the SDFI. Petoro is financed by appropriations from the government, and will not receive revenues from the SDFI's assets. These assets will be managed on the government's account. As before, income and expenditure relating to the SDFI will be carried on the central government budget.

The government's objective in creating *Gassco* was that a) gas transportation and treatment facilities will serve all producers and contribute to efficient overall utilization of resources on the NCS; b) it shall act neutrally in relation to all users of this infrastructure; and c) it shall play a key role in further development of the transport systems. Gassco took over as operator on 1<sup>st</sup> January 2002, and is based at Bygnes in Karmøy local municipality north of Stavanger. The company is, as Petoro, wholly state-owned. The establishment of Gassco did not change or harmonize gas transportation tariffs on the NCS. The further changes included rebirth of the *GasLed* idea from the mid-1990s. In that project, the ownership interests of several of the Norwegian transmission companies were to be combined to take care of dry gas transport from the Norwegian shelf to the continent (Statpipe, Zeepipe, NorFra/Franpipe and Europipe II). The new Gassled (II) system introduced in 2003 unified and harmonized transportation tariffs on NCS, cf. Chapter 3.4.3. Source entire Footnote: MPE 2002 and gassco.no.

The MPE appeared through the changes again with increased relative political power, as Statoil was in a position to act more (or only) commercially. The changes to the new political environment were in an entrepreneurial sense again radical, where Statoil no longer should be a direct political instrument, as in the early years. As the dominating owner, the state should now prioritize Statoil profits and shareholders value. Statoil's responsibility for the SDFI shares, transportation and processing of the oil and gas systems, other political consideration and factors that were not directly related to Statoil's own interests, were taken over by state organs, new companies and regulatory agencies.

Statoil continued however as the single seller of the SDFI / Petoro oil and gas. The links between state and company remained strong, partly because the state maintained its position as majority owner with some 2/3 of the shares. Government policy and structures changed with industrial and market maturation, in addition to the impacts from Norwegian - EU integration. The state gained a more regulative than interventionist role, but remained the main rent collector and capitalist in the sector; and continued in its role as a political industrial entrepreneur, cf. Chapter 1.1.

## **2.6 The state as regulator and capitalist**

Hence, the influence of the Norwegian state over her petroleum industry remained strong, and in many aspects stronger, since its inception and in spite of great changes. In the infant phase the state intervened not only as a regulator and organizer, but entered the "realpolitik" of petroleum markets and big international oil industry. Statoil was a tool both for the control and development of the industry in collaboration with the big internationals. At the same time, trade policy and regulations protected the supply industry, which was possible within international rules at the time. Experiences from Norwegian and other countries' industrial policy were set in a context where an exogenous change had taken place for the Norwegian society and industry; oil and gas had been found on the NCS.

This is what in Schumpeter's terms could be called a radical innovation process, and it led in a relatively short time to the emergence of a competitive

Norwegian petroleum cluster, and gradually an enormous profit for the Norwegian state. Ideologically the state operated in the borderland between being interventionist liberalist and realist / economic nationalist. This illustrates that the distinction between the different perspectives on international affairs and international political economy often cover aspects of the same story;

*"The sharp disagreement between realism and liberal theory is overstated. In fact, the two approaches can be complimentary" (Nye 1988:238).*

The Norwegian state occupied itself the role of a production entrepreneur, and built its own oil company rather than developing Norsk Hydro, as some proposed.

*"The non-socialist Borten government 1965-71 focused on using Hydro as the main commercial vehicle of national interests. This line peaked in 1970-71 when the government increased its stake in Hydro to a majority" (Ramm 2009).*

The state went further than Porter's (1990) conception of the role of a government in promoting innovation processes in a market economy, cf. Chapter 1.1. Domestically this was possible because of Labor party's strong position in Norwegian politics and long social democratic traditions across party lines. Industrial experiences from other countries and the nationalization of the oil industry in OPEC countries helped to bring about an international accept for policy.

The wing clippings of Statoil in 1984 and the later role of the company up to its privatization in 2001, led the MPE to a greater step-by-step direct control of decisions concerning natural gas activities, as seen through the GFU and FU arrangements. The MPE did as a bureaucracy not limited itself to

*"execute the prescripts of the rules and the statutes laid down by a higher authority" (Mises 1943:52).*

After Statoil privatization and changes in the organization of gas sales and transportation resulting from EU pressure, the role of the MPE was even more explicit and formal as regulator and company owner. This was the case, even though the direct control of gas contracts and supplying fields were terminated.

New state companies Petoro and Gassco were established, under the control of the MPE, as Statoil became “only a commercial company”.

However, even though the state maintained a dominant share in the ownership of Statoil and Hydro, in addition to 100 % of the SDFI, its role became gradually more that of a regulator and organizer for the industry, than a direct interventionist and participant in commercial activities. Direct influence over the company was to be formally exercised through shareholders’ rights. Keynesian and industrial interventionist principles from the infant stages of the Norwegian oil age were gradually replaced with more liberal ideologies, where an active state in running industrial activities became less acceptable. Changes in international rules and a more liberal economic ideology were important reasons for domestic change. At the same time the interventionist state was less needed. The maturity of the industry contributed to a principal logic based upon less direct interventions, as seen from the state’s point of view. Barch (1999) is in his discussion of Norwegian oil and gas policy in the 1990s phrases it thus as

*“the struggle between government control and market developments.”*

Questions over the relationship between Statoil / StatoilHydro and the MPE however remain. Wood (2001) in a comparison of public policy and industry in the U.K. and Germany discussed whether or not “business” in a country is “junior partner to government” or the other way around. In the establishment phase of the Norwegian petroleum industry it was clear that business was a “junior partner to government”. As the roles of Statoil as an instrument for the state was wing-clipped and the company eventually privatized, it became a Norwegian multinational oil company with engagements in many countries. This coincided with a strong increase in international trade and direct foreign investments. In 2007 Statoil “swallowed” Hydro’s oil and gas division and became StatoilHydro. Now the Norwegian state supports StatoilHydro’s international engagements in countries such as Azerbaijan, Angola, Algeria, Libya, Russia and Venezuela. At the same time, Statoil is promoting its interests at home in an expansion on the NCS (as for example through an increase in Troll production, rejected by the MPE in the fall of 2007).

As the company has become “only commercial”, questions have once again been asked about whether the government has become a “junior partner to business” (a principal-agent problem), as it was in the early 1980s, cf. Chapter 2.2. International ideological change, together with high oil and gas prices (and high company earnings) and the maturity of the industry, has transferred some power in determining petroleum policy in the direction of the industry itself, as discussed in the effects of economic integration in Chapter 1.2 and 1.6. The political wing-clipping and privatization have offered Statoil greater freedom in how to influence policy and to act as grown cuckoo, in line with the two-level game.

High energy prices and other countries’ wish for improved supply security and diversification of sources have, together with company interests (including Statoil), consequently become strong forces in the choice of production levels at the beginning of the 21st century. As foreign policy relations are primarily dealt with by the MFA, this ministry is increasingly influencing policy in adapting to EU regulations. In addition to the EU relationship, the MFA in tight market situations (as we have seen after 2001) will also be in contact with foreign governments about their wishes for more Norwegian oil and gas, relations to Russia in Barents Sea developments (such as the Shtokman field) etc. Some influence over (oil and) gas policy has consequently moved from the MPE towards the MFA<sup>38</sup> within the government structure, and towards consuming countries as an international force.

## **2.7 The Norwegian state as natural gas entrepreneur**

Chapter 1.1 provided a discussion of the roles of a private entrepreneur in developing economic activity. Kayne (1999:3) summarizes these roles as:

*“Entrepreneurship is the ability to amass the necessary resources to capitalize on new business opportunities. The term is frequently used to refer to the rapid growth of new and innovative businesses and is associated with individuals who create or seize business opportunities and pursue them without regard for resources under their*

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<sup>38</sup> The MFA has regained some of the influence it possessed in the build-up phase of the petroleum sector.

*control. They build something from practically nothing and usually reinvest earnings to expand their enterprise or to create new enterprises. Other words that characterize entrepreneurship include innovative, creative, dynamic, risk-tolerant, flexible and growth-oriented."*

When turning to the role of the state as a political entrepreneur, it was outlined how the state can enter into a greater number of private entrepreneurship roles and become an industrial actor itself. However, as the state is also a regulator, and law and policy maker, this means it has more instruments to use to reach its social goals than a private entrepreneur seeking to reach its private goals.

As political entrepreneur the Norwegian state used and combined several types of instruments when creating and developing her petroleum industry and natural gas strategy. Policies were changed and developed over time to adjust to new industrial and market realities, and new domestic and international political situations; to the intended benefit of Norwegian petroleum industry and the state itself. Main elements in the political petroleum and natural gas entrepreneurship were:

1. Providing a national ideological and visionary platform for the industrial and social goals of petroleum activities (the 10 Oil Commandments);
2. Regulating and protecting the functioning of and framework for the domestic markets to support the Norwegian supply industry and oil companies;
3. Providing a strong state controlled industrial and resource management system including the MPE and the NPD, as well as instruments like the FU;
4. Establishing its own oil company, Statoil, with substantial preferential treatment and governmental control;
5. Engaging international oil companies at an arm's length distance to acquire capital and competence;

6. Being engaged directly downstream in the sales of natural gas through Statoil and the GFU, and in the relations to purchasing countries and companies;
7. Developing a foreign policy that balances between major international political powers, as represented by political allies in the IEA and economic interests in the OPEC, and later with Russia;
8. Introducing a heavy system of taxation, and the arrangement with the SDFI to ensure that a major share of the economic rent goes to the state;
9. Establishing a petroleum fund to decouple expenditures from earnings of state oil and gas revenues; which largely also decouples oil and gas production and investment decisions (and production levels) from domestic macroeconomic constraints;
10. Increasing state participation, by establishing Petoro and Gassco and a new tariff system Gassled, when privatizing Statoil and adhering and adapting to EU gas directive and competition law.

As entrepreneurial *risk-taker* the Norwegian state took the economic and political costs to make an *ex ante* non-existing Norwegian petroleum cluster competitive, and in periods this required substantial direct financial contribution (the SDFI). A number of discrete innovative steps were taken so that the system would provide for incremental change over time. Policy was *ex post* largely successful; an internationally competitive Norwegian petroleum cluster was created in only a couple of decades. Moreover, the state retained a strong hand on all levels of NCS developments and took most of the profit.

The integration with the EU changed the maneuvering room for the state with respect to formulating policy related to the petroleum industry and reach set goals. Domestic policy was most directly influenced by the EEA agreement. The EEA agreement

*“implies, as other international agreements, that the state is not only the regulator, but is also object for regulation” (Arnesen 1995:659, my translation).*

What previously had been a

*“political question about which rules should be in force in Norway, was now to be ... a judicial question about the content of policy” (ibid.).*

The state gained a more regulative than interventionist role caused by integration with the EU, but also due to industrial and market maturity, in its role as a modified political industrial entrepreneur.

In the following, the different aspects of how the EEA agreement and EU gas market liberalization processes have affected the Norwegian state’s natural gas entrepreneurship are discussed in more detail. Chapter 3 discusses formal and *de facto* modifying effects of the EEA agreement on the Norwegian state’s natural gas entrepreneurship. Chapter 4 discusses how a fully liberalized EU gas market affects the entrepreneurial role of the Norwegian state. As this study expects the market, today and in the foreseeable future to remain imperfect and politicized, changes to the political entrepreneur has been and most likely will *de facto* be less significant, and partly different, than initially intended by the EU. Chapter 5 discusses main factors and mechanisms that are constraints the full liberalization of the EU natural gas market, and accompanying modifying consequences this has for the Norwegian state’s natural gas entrepreneurship.



## **3 The EEA agreement changes the natural gas entrepreneurship**

This chapter focuses on the how the EEA agreement has influenced the maneuvering room and policy options for the Norwegian natural gas entrepreneur, and changed her model for producing, transporting and selling natural gas. Firstly, the special role of the EEA agreement in Norwegian - EU relations is outlined. Secondly, the pressure from the EU for reorganization of the Norwegian natural gas sector is discussed. Thirdly, the Norwegian strategy including both conflict and cooperation with the EU in implementing changes is analysed. A game is presented to illustrate the process of threats and negotiations between the two. Fourthly, the new solutions for gas transportation on NCS are outlined and outcomes compared with EU demands and Norwegian preferences. Fifthly, general impacts from the EEA agreement on Norwegian petroleum policy are focused. Sixthly and finally, effects from the EEA agreement on the state's natural gas entrepreneurship are discussed.

### **3.1 The EEA agreement in a multi-speed Europe**

The EEA agreement was signed in 1992 and became operative on January 1, 1994. The agreement made it possible for the three EFTA countries (Norway, Lichtenstein and Iceland) that joined to participate in the Single Market in line with EU members. The main sectors exempted were agriculture and fishery. Another EFTA member, Switzerland, did not join the EEA agreement and deals with her relationship with the EU through bilateral agreements. The EEA agreement involves transferring sovereignty from the nation states to ESA and the EFTA court, but not formally to the EU. The three countries can participate in preparing cases by participating in the EU committees that suggest new rules or

changes in rules. The EU however, makes the final decision without their involvement, i.e. there is no vote from EFTA countries.

*"The Agreement gives them the right to be consulted by the Commission during the formulation of Community legislation, but not the right to a voice in decision-making, which is reserved exclusively for Member States" (EU 2007b).*

EFTA countries must unanimously accept a rule, which means that a single country has a right to reserve itself by vetoing against its implementation in the EEA committee (Stortingsmelding 2001-2002:27). So far, the right to veto has not been used by any EFTA country. This is partly due to the fact that, in case of a veto, the EU can take the entire area in question out of the agreement, which may incur substantial disadvantages for EFTA countries.

*"The credibility of the system has been ensured by the more or less full acceptance of the existing EU acquis communautaire (i.e. EU legislation in the Single Market area) by the EEA states and by effective implementation of these provisions. There have been no cases to date of the EEA states failing to accept the EU acquis, due no doubt to their overriding commercial interest in having access to the single European market, and the damage that would be inflicted to the credibility of this guaranteed access by exemptions or exclusions" (Emerson, Vahl and Woolcock 2002:5).*

The agreement is dynamic in the sense that new rules for the Single Market are designed and applied across the entire EEA area (the EU + EFTA - Switzerland). New subject areas can be introduced, and old ones can be taken out of the agreement. When the EU has expanded with new member countries the agreement has been renegotiated; implying mostly that EFTA countries had to pay more for market access, and to financially support the poorest countries in the EU. Both the "yes" and "no" camps in the Norwegian political debate about whether to join the EU as a full member or not, have criticized the agreement because of its passive one-sided character in favor of decision making by the EU. Nevertheless, when the EU expanded to 25 member states in 2004 and the Storting voted over a proposal to wind up the agreement, only one vote (Kystpartiet) supported its abolishment.

*“The EEA agreement is such a fragile construction which probably is more important for Norway and the other EFTA-countries to keep alive than it is for the other signatories” (Arnesen 1995:663, my translation).*

The background for the agreement on the Norwegian side was that the free trade agreement with the EEC from 1973, concerned with the reduction or elimination of tariffs on a number of industrial products, was by the third Labor government under Gro Harlem Brundtland (1990-1996) considered inadequate. This was a situation when Norway's most important trading partners in the EEC moved towards a deeper level of integration seeking to establish a Single Market and even a political and economic union (the Maastricht Treaty), cf. Chapter 1.3. About three quarters of Norwegian trade is done with the enlarged EU. The EEA agreement secured access to the Single Market for the countries that at that time belonged to EFTA (Finland, Iceland, Liechtenstein, Norway, Switzerland, Sweden and Austria). And it opened for cooperation on environmental issues, research, education, as well as consumer and social affairs. However,

*“the EEA Agreement is concerned principally with the four fundamental pillars of the Internal Market, ‘the four freedoms’ ” (EU 2007b).*

In spite of the important content of the EEA agreement in economic, legal and institutional terms it has never settled down politically. The EFTA lost much of its identity with the agreement while at the same time the EU developed much more rapidly than expected, in scope and width in policy domains outside the jurisdiction of the EEA. For many EFTA countries it became evident that the EEA agreement would not be satisfactory, and they regarded it as a stepping-stone to full EU membership, rather than as a permanent alternative. Finland, Sweden and Austria joined the EU as full members in 1994, while Switzerland chose neither to become an EU member nor to sign the EEA agreement. Only Liechtenstein, Iceland and Norway remained. The agreement comprises today substantially fewer countries than those who took part in its negotiation. The three EEA states have taken on board 3-4000 legal acts of the EU Single Market regime as of 2007 and implemented them into national law; the EU is the policy-maker and the EFTA countries are the policy-takers. The EU perceived the three remaining EFTA states

*“as being more interested in enhanced free trade than political integration”*  
(Emerson, Vahl and Woolcock 2002:1).

All EU members and the three EFTA countries must adhere to the EEA agreement (Claes and Førland 2004:216-221). This means that EU regulations for the Single Market must be applied for the whole EEA area, such that the free movement of products and services, labor and capital are promoted. The agreement also includes the regulation of subsidies; rules for public procurements; the implementation of standards and documentation rules; other regulations competition law; participation in EU programs for research and education; acceptance of other countries' education and qualifications etc. The only subject areas not included in the agreement are agriculture and fishery (but energy is included). While Norway has the right to reserve herself against the domestic implementation of for example an energy directive in Norway, she cannot veto against its implementation in the EU area. General rules, as for example in the practice and application of competition law, however, cannot be vetoed, and are handled by supranational organs such as the ESA and the EFTA court (Graver 2000).

The situation for Norway is that she ended up as full participant in the Single Market, but not as full member of the Union. This means that she has achieved a position, as many other countries, where scope and strength of integration with the EU is different to the position of the core EU countries. The different methods of differentiation of EU and European developments acknowledge this fact, although the terminology describing them may vary. Phinnemore (2007:36) and Junge (2007:396-398) outlines the core Europe model as a group of EU members interested in furthering integration across the board and hence engaging in further integration. This model can be described as a nucleus of members, for example among the six historic ones (but first of all Germany and France) wanting speedier integration and willing to embark on their own processes, that others must follow. The variable geometry model, by contrast, does not involve a single group of countries pushing ahead for more integration but rather multiple groups established for different policy areas (ibid.). While the core model requires a consensus among a single group of countries interested in further integration, the variable geometry model recognizes that countries have differing

political interests and concerns, and that these can make it easier to reach an agreement, cf. Chapter 3.6. The core Europe model could be implemented by creating parallel national and EU institutions, but the timing may differ across countries. Such an approach would not work for the variable geometry model, since a single set of parallel institutions would not be needed, but rather one per policy area.

The EU has partly adopted a variable geometry model. Both the euro and Schengen are for example policy areas in which some countries participate but others not, and in both cases some non-members participate as well. The Norwegian choice of the EEA agreement can be considered in line with these types of differentiated EU participation: neither countries nor specific markets need to integrate with the same speed and scope in Europe or in the EU.

Even though the EEC had several elements of positive integration with common market characteristics from the start, it was with the establishment of the Single Market in 1993 that all aspects influencing competition became objects for regulation and intervention from the Community. One reason for it taking 35 years to fully realize what the Treaty of Rome established by name in 1958, was that main advantages of economic integration are not won immediately. Businesses, people, societies and policy needed and obtained time to adjust. Another reason was that the redistributive effects of economic integration led to conflicting interests between winners and losers, and halted the process for long periods, cf. Chapter 1.2 and 1.4. The disagreements and differences between member countries in willingness and ability to adjust have created a system with various degrees of policy harmonization across countries and markets. Cultural, historical and other non-economic aspects have contributed to the differences. Institutions and associations resisted changes. From its very start the EU system developed in a non-uniform and multispeed manner in more areas.

The debate over the future of differentiation of the EU moves in two directions.

*“It seems likely that the EU25, negotiating with various neighbors for association or membership, will accommodate even greater diversity in the future” (Wallace W: 2005:502).*

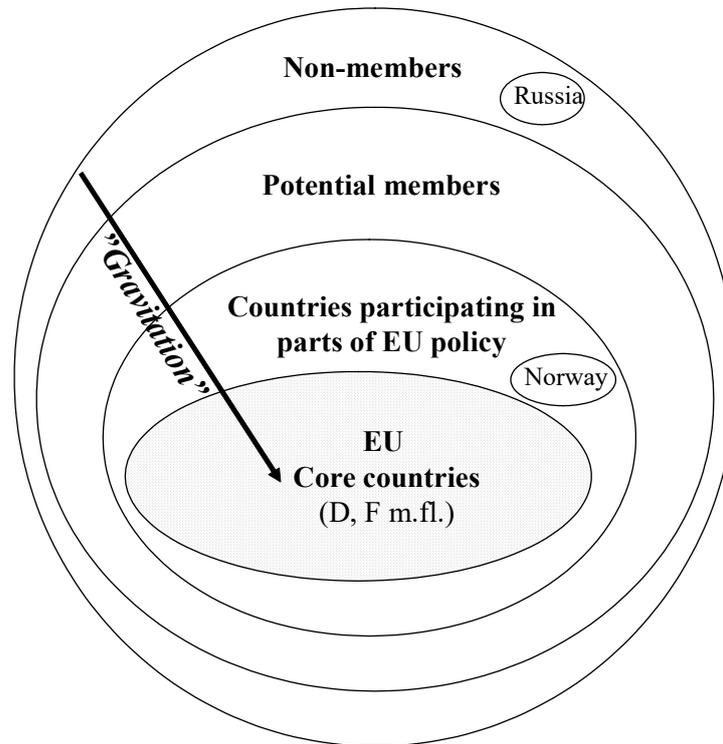
On the other hand,

*“differentiation raises the possibility of undermining fundamental principles on which the EU is based” (Junge 2007:402).*

*A multispeed approach tends to look at these developments on the European continent as a whole (ibid:397).*

In a multispeed approach, the pressure for integration goes in the direction of those integrating the most, and countries form relations to each other in what can be illustrated as a system of concentric circles, cf. Figure 3.1. The fastest integration takes place among the original member states (such as France, Germany, Be-Ne-Lux and Italy) and among those introducing the euro. Countries participate more or less in core countries' policies. Those who are not members of the EU, or formulate separate agreements as binding policy (such as the EEA agreement for Norway) integrate through more open markets, increased competition and following pressure towards policy harmonization (such as Russia and Ukraine). Hence, participation in the European (and international) trade system pushes all European countries economically and politically towards the inner circle, where integration is deepest. Consequently the EU is developing at a multispeed pace and is differentiated in scope. The long-term trend is that individual countries move gradually, or sometimes discretely, from one circle to another. Most often they move closer to the center, with an accompanying policy convergence with others.

Figure 3.1: European political developments in concentric circles



As countries like Germany and France are the perhaps most prominent core countries, they are more than other countries capable of influencing the economic, political, social and security development of Europe. Other countries are influenced by these developments, but not all take part in all policy areas. Some countries for example, involve themselves in euro cooperation and others do not (the U.K., Denmark and Sweden + EU-12 in transition). Some participate in the Schengen cooperation (such as Norway) and others do not (such as the U.K.). Some are active in the Single Market (such as Norway), but not in foreign and security policy areas.

At its extreme the processes might lead to a merging of participating countries into a federation, cf. the discussion around Figure 1.1. However, the EU could also permanently retain its confederative structure, with federal aspects, based upon the inherent differences between the countries. The EU is much more diversified in most areas, as compared to for example the U.S. While there are more or less permanent differences in scope of integration for "old" EU countries,

the new EU-12s are to a larger extent obliged to core country policy implementation after a transition period. Degree of integration can and will vary over time, policy area and space.

The level of integration, the speed of change and the position of the various actors in the overall European system is important for maneuvering room and policy options in national policy making. With the EEA agreement Norway adopted much EU core policy in terms of market regulations and competition law, which legally limited the state's domestic maneuvering room as natural gas entrepreneur. Increased competitive pressure was put on the Norwegian industry. Market regulations (directives) and competition law eventually also required domestic institutional changes. The participation in the EU construction led to a weakening of ideological support for a strong state industrial entrepreneurship.

However, the EEA agreement was for Norway not designed to defend petroleum interests, but for the interests of the rest of her economy, cf. the discussion around Figure 1.3. Strictly speaking, Norway did not need an EEA agreement to sell gas to the EU. It was the rest of the economy that had/has a major economic interest in securing market access and rules of fair competition. *Ceteris paribus*, it would have been better for Norway not to have natural gas activities included in the agreement, if the only goal had been to maintain as large as possible maneuvering room for national gas entrepreneurship. However, the integration process required that singular interests were balanced against other economic interests, cf. Chapter 1.4.

With the EEA agreement's passive character, Norway's influence on EU policy is more limited compared to that of member countries. If Norway becomes an EU member and gains the right to influence the formulation of regulations, she might seek to shape them in her favor. If a trade agreement was the alternative, as in the case of Switzerland, she could explicitly try to exempt natural resource management as far as possible. Both membership and the trade agreement alternatives appear as better general political frameworks for the maneuvering room for the state's natural gas policy entrepreneurship than the EEA agreement.

Norway has as a consequence, put herself in a different situation than Europe's (and the world's) largest natural gas exporter, Russia. They have maintained their freedom to arrange domestic natural gas activities more independently, positioned further away from the core of the EU than Norway. Russia is however also affected by what takes place downstream in the market. When many countries in the EU harmonize or get common policies in relevant areas, as compared to the collection of a sum of more independently nationally defined policies, the framework and structure of the Single market, and the resulting prices and contractual terms, have the potential for changing more strongly. Producers and purchasers in the EU will not always share interests with respect to market regulations and market framework, such as for example in the areas of energy taxation and forms of market liberalization and regulation, as discussed in Chapter 4.6-7.

Norway and Russia on the other hand, to a large extent share interests in natural gas market developments, besides being competitors. Norway has also an interest in what the Russians as market leaders do domestically, as well as in her relations with the EU in the sector. EU and European integration processes and diverging economic interests between producers and consumers in the field of natural gas, have offered the Norwegian state's natural gas entrepreneurship a new dimension in her relation to Russia, cf. Chapter 5.3.3-4.

### **3.2 EU pressures for changing Norwegian natural gas policy**

With the EEA agreement Norway adopted general EU competition law, regulations and specific area directives. Norway was forced to follow the gas directive (EU 1998) and introduce TPA on the NCS, as well as abolish the GFU and FU arrangements according to the interpretation of EU competition law. Around this time Statoil was also partly privatized, cf. Chapters 2.2 and 2.5. Hence, the substantial reorganization of Norwegian oil and gas activities in 2001/2002 must be understood as the result of three factors; the privatization of Statoil and the twin pressure from the EU to make her adapt to EU competition law and the gas directive, respectively.

*Firstly*, Statoil expressed a strong desire to be partly privatized (Statoil 1999), cf. Chapter 2.2. This process started 3-4 years earlier and culminated in a government proposal to the Storting (Norwegian parliament) in December 2000 (Stortingsproposisjon nr. 36, 2000-2001). This suggested selling up to 20 % of Statoil's equity to private owners, and listing the shares on the stock exchange. As a condition, the government proposed establishing two 100% state-owned companies that would take over tasks previously performed by Statoil; Petoro and Gassco, cf. Footnote 37. The proposal was passed by the Storting in April 2001.

Secondly, ESA investigated the legal basis for the GFU. This investigation started in 1996. Saga Petroleum wanted to directly sell gas to the German company Wingas. This was blocked by the GFU. The MPE followed the advice from the GFU majority: Statoil and Hydro. Wingas complained to German competition authorities who forwarded the complaint to the EU. The process culminated in the spring of 2001 with indications that the EU would issue a SO according to article 81 of the EC Treaty and article 53 of the EEA agreement, both relating to competition law, cf. Chapter 2.5.

Faced with this challenge, the Norwegian government proposed (early June 2001) to abandon the GFU system of gas negotiations, as far as sale of gas to the EU was concerned. Thus, the companies having property rights to gas on the Norwegian continental shelf should thereafter set up systems for individual company sales of natural gas. In spite of this change of Norwegian policy, the EU on the 8th of June 2001 issued its announced SO to Statoil and Norsk Hydro (as members of the GFU), and shortly afterwards the SO was expanded to cover all gas producing companies on the Norwegian shelf. The issuance of a claim that all Norwegian gas contracts entered into over the last 15 years were established on an illegal basis, formally after 1995 when Norway entered into the EEA-agreement, was obviously a big surprise to the Norwegians. EU argued that the buyers under these contracts should have the freedom to choose whether they wanted to cancel, renegotiate or maintain these agreements.

*Thirdly*, Norway accepted the (first) EU gas directive (1998), cf. Chapter 4.6, and its integration into Norwegian law, also for offshore pipelines on the

Norwegian shelf. The debate about the directive had been going on for some time, with discussion of various proposals to push for an extension of the deadline for implementation. Norwegian authorities had applied for a 5-year extension in order to find arrangements which satisfied the directive, and which at the same time addressed the issues of economics of scope and optimal resource management. In 2001 Norway gave up its resistance and the directive became part of Norwegian law in June 2002. Only after this did the EU abandon its SO against Norway, cf. Chapter 3.5.

The GFU and FU arrangements and existing transportation solutions were defended from a Norwegian national point of view. The arguments were that "free competition" in production and sale between companies might contribute to weaker resource management, a larger supply of gas in the market and put pressure upon prices, particularly in the short and medium term. The impaired possibility of exploiting economies of scope by opening the Norwegian pipelines through a TPA arrangement might technically make things more complicated and more expensive. The advantages of scope between Norway as a gas seller and the large transmission companies on the Continent, expressed through the long-term Take-or-Pay (TOP) contracts, were also pointed out. The GFU was regarded as part of the Norwegian resource management system and the MPE (1997) did not

*"consider the EEA agreement applicable to the establishment and functioning of the GFU".*

Maintenance of the model would assure that Norway was still able to appear as a stable supplier of gas with "factory gates" in Emden, Zeebrügge, Dunkerque and St. Fergus. A change in joint management might put long-term investments at risk and through that weaken the supply of gas, which would be a disadvantage, also to purchasing countries in the long-run.

For natural gas, the argument about maintaining market power through the GFU was contrary to the principles of a liberalized market, as well as the direct interests of consumer countries (EU member states). On the other hand, the principles for how FU worked were not automatically at variance with EU's Single Market principle, as long as MPE did not discriminate between who was to

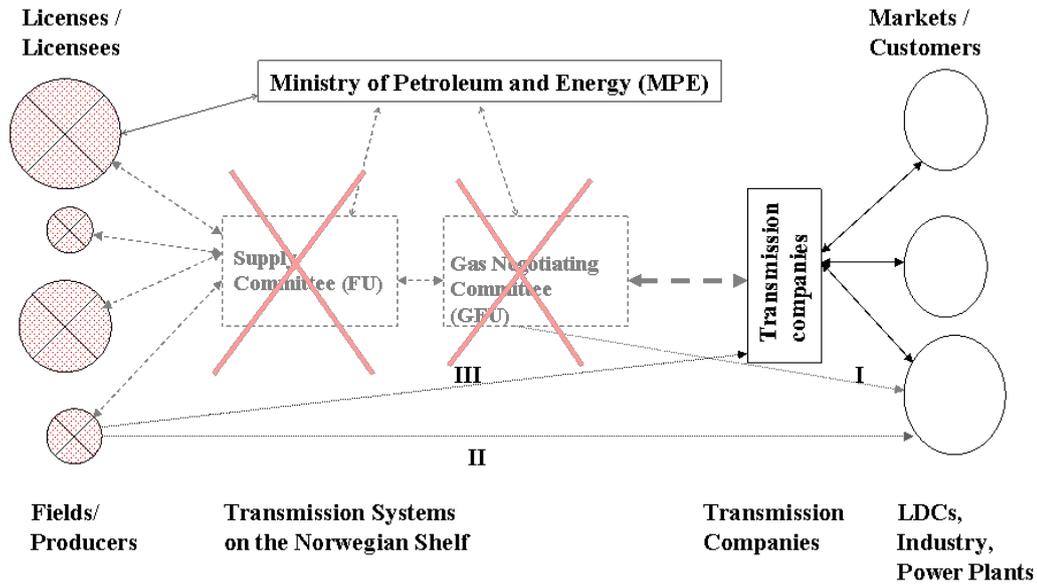
receive licenses on the NCS. The Norwegian arguments for optimal resource management and the exploitation of economics of scope are something that the EU also should take into consideration and furthered in their liberalization efforts, cf. Chapter 5.4.

At the same time, it is not obvious that the GFU maintained in its old shape was an organ that was sufficiently dynamic to safeguard Norwegian interests when many smaller and more short-term contracts were evolving in the market. The market had been undergoing fundamental changes for some time through an extensive growth and infrastructural developments, and this gradually required that Norwegian gas should be sold to a greater number of customers under more variable conditions than before, as in the third stage of a gas market development outlined in Chapter 4.1. A changed role for the GFU could have been in Norwegian interests anyway. Thus, the GFU arrangement had for a long time been under pressure, both politically and from the market. Market developments and political efforts pointed towards producers increasingly selling gas directly to the customers of gas (distribution companies, the industry and gas power plants). The buyers of "new" Norwegian gas (new contracts) would not (only) be the same as before (the transmission companies), but also the transmission companies' customers. Future gas contracts were to be made on a more fragmented basis than before, cf. Chapter 2.6 and Chapter 4.3.

The result of the discussions between Norway and the EU was that TPA was to be introduced on the NCS. While Figure 2.1 illustrated the organization of Norwegian gas sales in the period 1986-2001, Figure 3.2 shows options for Norwegian gas sales after 2001. For the reorganization of the sector it led to the question about who should actually be considered the *producer* on the Norwegian shelf. If Norwegian gas had continued to be sent to the market as one commodity through one seller, it would mean that the GFU (or a corresponding arrangement) would sell directly to the customers from the "factory gates" located at the landing points for the Norwegian pipelines. This is illustrated by arrow I. Depending on total growth in supply relative to growth in demand, this might have been an improvement for Norway, as it would have strengthened Norway's relative negotiating position in the market, transaction costs

disregarded. Obviously, the EU countered such an outcome, both from a principle and interest point of view.

Figure 3.2: Models for the sale of Norwegian gas after 2001



From an EU (short-term) cost point of view the goal was that as much competition as possible should be created among Norwegian gas producers. This would happen when each individual license holder in the fields sold their gas independently. This would split and make each seller as small as possible. If downstream liberalization works the buyers will be the customers to the licensees (arrow II). On paper, both buyers and sellers of gas would then operate on an as competitive a basis as possible. If downstream liberalization did not take place, however, and transmission companies would *de facto* to a large extent remain as purchasers (arrow III). In such a case, the competitive position of Norwegian gas sellers would seriously deteriorate.

However, perfect competition is difficult to achieve on both the demand and the supply side in the European gas market. On the demand side it is possible that not so much would happen downstream, as was the intention behind the directive. For example, with the first gas directive (EU 1998), it was up to national authorities whether there would be a negotiated solution or publicly regulated

tariffs for transportation. Most countries have chosen regulated tariffs, but for example the biggest country Germany has chosen a negotiated tariff system. Obviously, one difficulty in maintaining a negotiated TPA arrangement over time is that a party may bring what is considered an excessive tariff before the EU for evaluation, for instance by the Competition Directorate DGIV. The possibility that the EU might introduce some form of *de facto* regulatory authority puts a moderating pressure on explicit and implicit tariff arrangements for all transmission companies, being common or private carriers, cf. Footnote 52.

On the supply side, nor is it likely that “perfect” competition between licensees will be accomplished. A licensee with a given percentage of a field may not sell more gas than the share makes possible and this volume depends over time on what all the other licensees are selling. Together with gas production there is also production of crude oil from most fields. From the point of view of resource optimization, the production of oil and gas must be optimized with regards to each other in order for reservoirs to be optimally exploited. It would *over time* be nearly impossible to sell from one licensee in a field in a comprehensive manner without coordination with the other licensees. This implies that the lowest possible *de facto* level for defining a producer over time would have to be the production area or field.

Norway did not immediately accept demands for policy importation as a response to the twin pressures from the EU. She resisted moving towards a more open and flexible transportation solution on the NCS and the abolishment of GFU/FU arrangements. She moved however eventually, from a position of conflict to a position of cooperation. This entailed accepting the principles contained in the directive, as well as the EU definition of competition rules and how they were to be understood with respect to the selling and allocation of Norwegian gas. The actual outcome of the changes was however more a-la-Norvége, and implied that most goals of the political entrepreneurship could be maintained. Would Norway have been better off staying in conflict with the EU and vetoing the abolishment of the GFU and the introduction of the directive on the NCS? Or was her change of strategy better, seeking instead to “trap” decisions and implementation in order to make them as favorable as possible?

### 3.3 Strategy, conflict and cooperation with the EU

In the following, we present a game to study the Norwegian strategy of conflict and cooperation around the introduction of the gas directive (TPA) and the abolishment of the GFU/FU-arrangements on the NCS. The point is to demonstrate that the best choice of strategy for the two interdependent actors, Norway and the EU, depends firstly on their relative strength; if one party eventually becomes too strong (the EU), cooperation is better than conflict (for Norway). Thereafter, in Chapter 3.4, the structure of gas transportation tariffs and arrangements on the NCS before and after the change in the system are outlined and compared, and its impacts discussed.

This discussion is partly to do with the question of adaptation to the new (EU) rules after an agreement is made, as discussed in Chapter 1.2 and Chapter 1.4-5. The analysis shows that after the change there is still a strong Norwegian state that directly or indirectly concentrates ownership of gas reserves and production, keeps a more direct governmental control of transportation infrastructure than before and maintains a tariff structure that is changed only to some extent, although TPA is introduced. The significantly changed system in formal terms, in accordance with EU demands, *de facto* led to more characteristics resembling the old system than a fully liberalized structure, as defined in Chapter 4.3. This parallels much of the situation in downstream markets, cf. Chapter 4.1, Chapter 5.1 and Chapter 5.5-6. Hence, this study claims that the change of strategy to cooperate with the EU was largely successful, as seen through Norwegian lenses and as policy goals were defined.

#### 3.3.1 Strategy of conflict

Let's first assume a simplification of the interest of the EU to unconditionally wanting to change the Norwegian system according to her demands. The interest of Norway is similarly assumed simplified to unconditionally maintain the existing system in the shape it has had (maintain the existing NGF). Thus, the interests of the EU and Norway are assumed identical but conflicting. This binary situation, the choice between introducing the EU system (or regulation) versus maintaining the existing Norwegian system is illustrated in Figure 3.3.

Figure 3.3: Strategy of conflict

		NORWAY	
		Norwegian system	EU system
EU	Norwegian system	<div style="text-align: center;"> <b>I</b>            0 (EU), 3 (Norway)         </div>	<div style="text-align: center;"> <b>II</b>            1 (EU), 0 (Norway)         </div>
	EU system	<div style="text-align: center;"> <b>IV</b>            2 (EU), 1 (Norway)         </div>	<div style="text-align: center;"> <b>III</b>            3 (EU), 0 (Norway)         </div>

Both the EU and Norway is assumed to choose between favoring a process that introduces EU regulation, and maintaining the incumbent Norwegian system. The outcome for Norway is depicted in the upper right corner in each cell, and the outcome for the EU is depicted in the lower left. Best possible outcome for each party is value 3 and worst possible outcome value 0 (zero). All utility is considered ordinal where each may rank the outcomes, but does not know how much better or worse it is compared to another outcome.

An EU choice that the Norwegian system can be maintained represents her worst possible outcome, equal to the value 0 (zero). At the same time, this would be the best for Norway with the value of 3, as depicted in cell I. On the other extreme, a situation where the EU enforces her regulation on Norway, and Norway fully adheres, would be the worst possible for Norway, value 0 (zero), but the best possible for the EU, with value 3. The outcome when both parties favor EU regulation is depicted in cell III.

If Norway opposes regulation and the EU nevertheless chooses to try to enforce her system, the outcome for the EU must be assumed to be of less value than if Norway just accepts the new terms of operation. In this case, Norway

fighters against EU regulations, making as many difficulties as possible for the EU, and trying to postpone and destroy EU initiatives. In spite of this resistance, EU efforts can be expected to yield a better outcome for the EU than if no such enforcement takes place, but less than if Norway merely adheres. This outcome for the EU is depicted with the value 2 in cell IV. At the same time, Norway can be expected to gain compared to a strategy of just following EU wishes and desires, but less than if no EU rules were introduced, depicted with the value 1. Cell II represents a situation where Norway voluntarily desires to change her system, and the EU does not. Under the assumption above, this is considered an impossible combination of strategies.

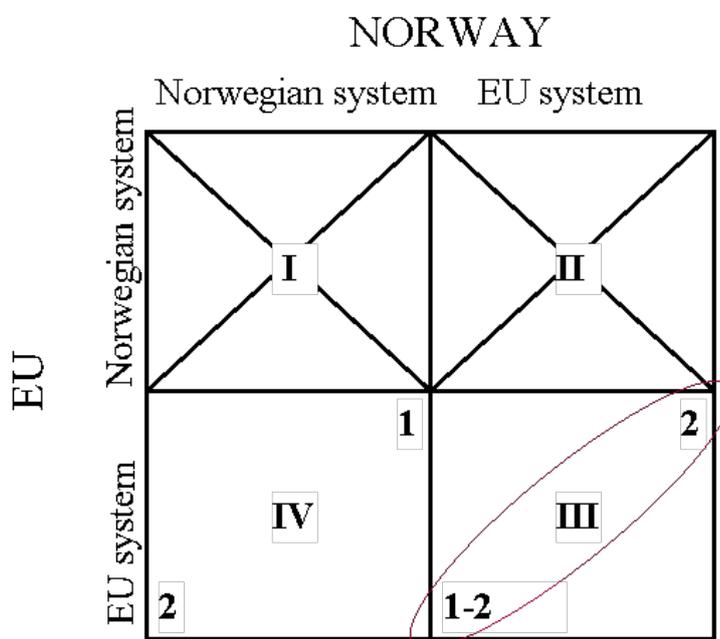
Even if the outcome for each depends on the choice of the other, both Norway and EU have dominant strategies. Norway will gain 0 (nothing) if EU regulation is supported, and 3 or 1 if regulation is opposed. Opposing EU regulation will be a dominant strategy for Norway. The EU will gain 0 (nothing) if it does not enforce regulation and 2 or 3 if it does. Favoring enforcing her system will be a dominant strategy for the EU. Outcome from cell I (status quo) will result if the EU is *unable* to force regulation on Norway without her acceptance. Outcome from cell IV will result if it can enforce regulation. The dominant strategies indicate that this is a situation of direct confrontation between involved parties. The relative political strength of the EU and Norway will be a main variable determining the final outcome whether to end up in cell I or IV.

### 3.3.2 Strategy of cooperation

Let's now assume that Norway knows that she *cannot* prevent the introduction of EU regulation for NCS natural gas activities. The option maintaining the Norwegian system will no longer exist for Norway. The question that arises is whether she is best served by continuing to show a maximum amount of resistance, or if it is better to cooperate with the EU in order to design and implement a regime that is nevertheless, as favorable as possible given the new regulations. This is as a principal/agent problem, in which the agent tries to take control of his/her principal and traps the regulator to act according to its desires (Binmore 1992: 526-530).

In this situation, when Norway continues to resist and the EU nevertheless intervenes, the outcome is the same as in the previous game, as depicted in cell IV in Figure 3.3. Norway knows that the best result she can expect by opposing a new system is of value 1 (cell IV) because the EU certainly will now introduce the system (cell I will not be possible). However, by participating in the regulatory process, instead of only opposing it, Norway might succeed in achieving a value at least as high as when opposing EU regulation. This will be the case even though it will still be lower than if it was not introduced, set to value 2 in cell III, cf. Figure 3.4. By doing this, the outcome for the EU may simultaneously be reduced to less than if Norway only adheres to EU initiatives, set to value 1. At the same time, however, when Norway participates in the process, better solutions can be found than if the EU is to figure out all details. In this way Norway makes it easier for the EU to accept Norwegian modifications and expands the EU Win-Set, cf. Chapter 1.6. Hence, the outcome for the EU *may* not necessarily be reduced compared to cell IV, with a value closer to 2.

Figure 3.4: Strategy of cooperation



In this situation, EU dominant strategy will still be to enforce regulation, as this will yield a better outcome, no matter what Norway does (2 or 1). Norway,

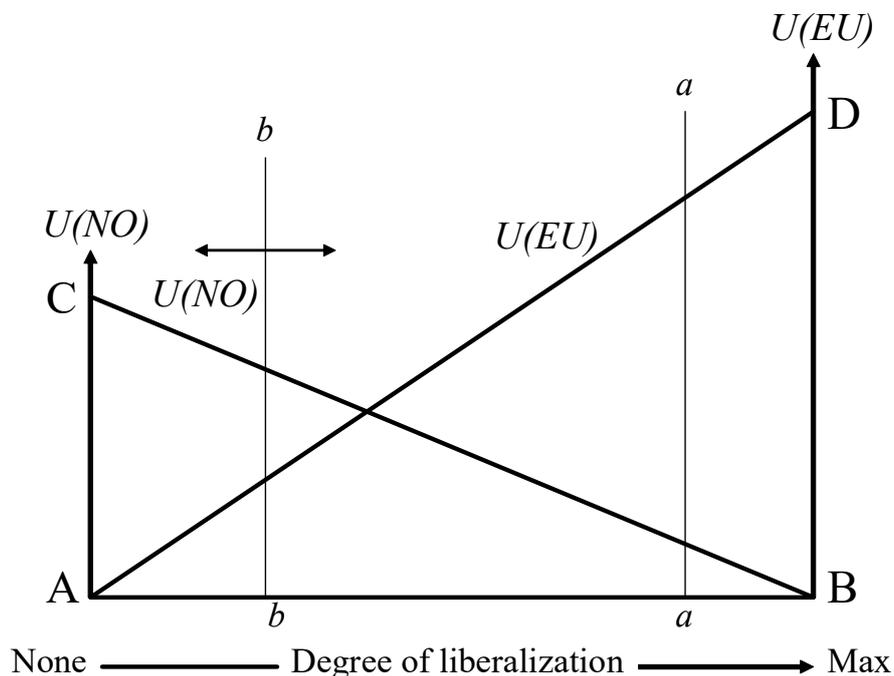
however, will benefit by changing her strategy to collaboration because she knows that EU regulation cannot be avoided. By participating in the formulation of regulatory mechanisms the situation can be improved (value 2 in cell III), compared to opposing it (value 1 in cell IV). Still, if Norway considers that the EU does not possess the authority to enforce it, or it can be prevented by some means, she will choose to oppose change, as shown in cell I in Figure 3.3.

### 3.3.3 Pay-off-matrixes for Norway and the EU

When the EU required a change in the Norwegian gas model it was not entirely clear whether or not she would have the political strength to enforce the introduction of a TPA system on the NCS and abolish the GFU arrangement. Thus, in the beginning of the process, Norway benefited from resisting EU regulation as long as it was possible. On the other hand, the change of strategy towards collaboration can be considered wise, as long as this yields a (potentially) better result than continuing to oppose it, if a veto gradually appeared to be increasingly more unrealistic.

The game's theoretical results from the negotiation *processes* can be illustrated in critical-mass models - often called "Schelling-diagrams" (Schelling 1978:102-110). In Figure 3.5, on the vertical axis to the left, the utility for Norway,  $U(\text{NO})$ , is measured, while on the vertical axis to the right utility for the EU,  $U(\text{EU})$ , is measured. The horizontal axis between the two vertical axes measures the "degree of liberalization". To the left, at point A, no changes are introduced on the NCS; to the right at point B, the market is completely and perfectly liberalized (competition between natural gas sellers are introduced and transportation tariffs regulated down to cost-plus schemes). This is an immeasurable continuum, but can be thought of as an indication of the number of regulatory initiatives, whereby the more liberalized, the more interventions must take place, such as the introduction of increasingly more regulatory details and degrees of competition.

Figure 3.5: Pay-off matrix for a regulatory process



Maximum utility for Norway is achieved if no EU regulation is introduced, as illustrated in point C. In this situation, minimum utility for the EU is attained, as illustrated in point A. If full and perfect market liberalization (cf. Chapter 4.3 for definition) is introduced, and Norway just passively follows EU initiatives, maximum utility for the EU is achieved, illustrated in point D. In this situation, minimum utility for Norway is attained, as illustrated in point B. Thus, the utility possibility curve goes from C to B for Norway and from D to A for the EU, depending on how “liberal” the regime becomes. The curves' down and upward directions illustrate that greater (and more efficient) EU regulation takes increasingly more utility/profit from Norway and transfers it to the EU.

Under the assumptions set up, the game is not zero-sum. The EU regulatory system would yield a greater surplus for EU society than the social loss for Norway. Maximum EU utility (point D) is reached as greater than the maximum utility for Norway (point C). Point D is higher on the right axis than point C is on the left axis because the gain for the EU is expected to be greater than the loss for

Norway under EU regulation, as is the general case when trade is liberalized, cf. analyses of “trade creation” (Austvik 2002: 319-321).

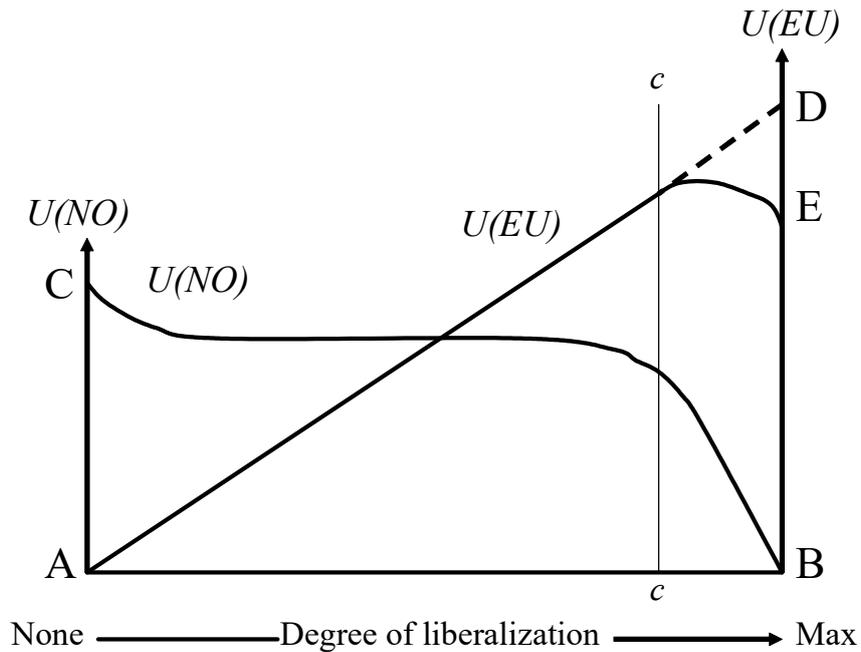
The outcomes in Figure 3.5 can be traced back to the games illustrated in Figures 3.3 and 3.4. In Figure 3.3, point C (value 3 for Norway) and point A (value 0 for the EU) represents cell I, where no EU regulation is introduced. Cell III is represented by point D (value 3 for the EU) and point B (value 0 for Norway). Cell IV yields outcomes somewhere between C and B for Norway (value 1), and A and D for the EU (value 2). By opposing EU regulation, Norway may succeed in retaining some of her surplus. This will simultaneously reduce the benefits for the EU and is illustrated by the vertical line *aa*. Thus, under our assumptions, the line *aa* represent the worst possible outcome for Norway (value 1) when conflict with the EU is chosen, and the best possible outcome for the EU (value 2).

If Norway knows that NCS activities must be reorganized to follow EU demands in spite of her protests, she may start to interact with the EU to design the system in a best possible manner for herself. If it fully succeeds in capturing EU decisions, surplus may be maintained almost as in the Norwegian system (point C). The vertical line *bb* illustrates a situation where Norway has managed to maintain most of her surplus, but not all, through this interplay. Norway’s outcome is somewhere between 1 and 3, or value 2, while EU’s outcome is simultaneously reduced from value 2 to 1.

If Norway however can influence EU regulation in a way that also improves efficiency, and not only her own surplus, as compared to a situation with no interplay with the EU, there may even be Pareto improvements in the process. This may happen because the EU’s insight into industry complexity on the NCS may be limited and partly be dependent on Norwegian information and actions. Such examples can be found in the U.S. regulatory history, where regulators have made inadequate decisions for the industry, with huge losses in efficiency and resultant stop-and-go-policies, cf. Chapter 5.5.6.1. In this case, the utility curve for Norway will not be a straight line. In Figure 3.6,  $U(NO)$  is dropping when some EU regulations are introduced. When she starts to interact with the EU in the

formulation of arrangements she can manage to maintain her surplus at the time as the EU surplus is increased.

Figure 3.6: Pay-off matrix if Norway makes EU decisions more efficient



This is due to the assumption that Norway can suggest arrangements that are more efficient than the EU could do herself. Overall surplus in the market is increased compared to the first strategy which is more static. At some level of liberalization, illustrated by the line  $cc$ , Norway may start to suffer again; regulatory interventions are so comprehensive that her utility curve drops more steeply down to point B. In this situation, it is possible that the best point for the EU could never be reached because she lacks the ability to open the market perfectly in an efficient manner and, thus, needs the collaboration of Norway. By trying to move Norway all the way to point B, the outcome for the EU may be worse than if stopped at  $cc$ . Thus, utility for the EU may drop if more detailed and “squared” regulation is introduced as illustrated by point E. Through

collaboration, the Win-Sets for both Norway and the EU are expanded and an agreement is more easily reached, cf. Chapter 1.6.<sup>39</sup>

### 3.3.4 Conflict or cooperation?

The most important information we can get about Norway's strategy from this analysis, independent of the shape of the utility curves, is that it depends heavily on whether the EU obtains the power and possesses the ability to enforce a more liberal regime on the NCS. Norway is better off by adopting a dual strategy, opposing any initiatives taken by the EU as the first step, and simultaneously preparing for interplay in designing optimal regulatory regimes, if or when they arise.

Norway is best served if she succeeds in delaying or destroying political decisions giving the EU power to enforce the system on Norway, arguing about the complexity of regulations, security issues, or any other arguments that work. Nevertheless, when or if a decision about actual EU regulation is made valid for Norway, she should shift partly to a collaborative strategy. The EU should, on her side, try to penetrate a possible collaboration across the gas industry in the EU and design regulatory regimes with only one or a few of them. If a critical mass of countries and transmission companies cooperate, the rest are more likely to follow.

In the dynamics of this decision making process, the strategies may shift from conflict to elements of cooperation, and back. When and how the parties collaborate and when they confront each other, depends on the shape of the utility curves. The shape depends on market complexity, competence among parties' ability to intervene etc. If one accepts that it is difficult to reach a fully and perfectly liberalized market, it is advisable to instead discuss what would be the optimal degree and form of regulation, not only in the sense of theoretical economic efficiency (and orthodox liberalism), but also in terms of political and practical feasibility, and the particularities of the sector in order to find better regulative schedules than those indicated by straight-forward standard

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<sup>39</sup> The two ways the utility curves are drawn are just examples on their many possible natures. They may be bowed in various ways or even be discrete.

microeconomic schemes (*cc*). In Chapter 5 four constraints for achieving a straight-forward liberalized European natural gas market are discussed; intra-EU problems to reach common decisions; international affairs and security-of-supply and security-of-demand; the nature of gas as a non-renewable resource; and regulatory issues. By respecting these constraints, the design of a liberal market should be modified to respect the particularities of the market in general and its spatial differences, and as illustrated by the line *cc* in Figure 3.6, as compared to the straight-forward variant with the (*de facto* impossible) goal of reaching point D.

This type of negotiating dynamics can be considered relevant for understanding international, as well as intra-EU negotiations in general, cf. Chapter 5.2-3, and the challenges the EU faces in making an efficient regulatory design of the behavior of Transmission System Operators (the TSOs), cf. Chapter 5.5. Chapter 1.4 discussed the dynamics of economic integration processes and described how in an economically integrated world countries continue to promote and defend their interests within the framework of the agreements they have signed, cf. the discussion around the upper left box in Figure 1.2. It was in addition, also argued that it was important to find ways of commercially and politically adapting to the new situation in ways that benefited nationally defined interests within the new maneuvering room.

### **3.4 New solutions for natural gas activities on the NCS**

How much did the reorganization of production, transportation and sales of natural gas from NCS change as a result of the EEA agreement and EU pressure in 2001/2002? To what extent and in what manner did the processes change the maneuvering room and policy options for the political entrepreneur and his ability to reach goals? The twin EU pressure on the Norwegian gas model consisted of; a: arguments against the GFU - FU arrangements, based on EU competitive law, and b: the demand to introduce TPA on the NCS, based on the first gas directive.

a: The abolishment of the GFU-FU arrangements made gas sales more fragmented, but less than what might be considered "free competition" between

sellers. This was due to two main factors. Firstly, the bulk of Norwegian gas production comes from a few fields, with Troll as the dominant contributor. Secondly, there is strong concentration of owners with Norwegian state dominance across the fields. SDFI alone represents more than 40 percent. SDFI and StatoilHydro together represent 70-80 percent. The abolition of the GFU system did not fundamentally change the seller concentration measured by fields or companies on the Norwegian shelf, although it was modified by Statoil privatization. The role of the state towards Statoil and Hydro became more regulative, but the state also strengthened her own position through the establishment of the independent state company Petoro. This paralleled what happened downstream where the market became more open. Many of the previously dominant commercial actors still remained and some even became stronger (such as in the E.ON - Ruhrgas and Gaz de France - Suez merger cases). The new Norwegian solution was more flexible than the old system, which market maturity and diversity already had made necessary.

The abolishment of the FU implied however, not only that the coordinated gas sales were terminated. It also gave new challenges in the coordination between oil and gas production, resource management and the exploitation of scope benefits in the production and transportation of gas. Obviously, in mature parts of the Norwegian shelf this could be dealt with more easily than in undeveloped areas in the Norwegian and Barents Sea, cf. Chapter 4.1 and 5.3-4. This challenge can however be met by a stronger regulatory hand directly by the MPE / NPD when accepting field developments and production profiles (as opposed through the FU).

b: The way transportation of gas was organized on the NCS was radically changed. The establishment of state company Gassco to run the gas pipeline system and the Gassled tariff system opened up pipelines and terminals on the NCS for 3<sup>rd</sup> parties. However, transportation tariffs were in important parts maintained (see discussion below). In weak market situations, high upstream

transportation costs continue to hamper the development of marginal fields, and hence oversupply of gas.<sup>40</sup>

The ownership structure in the individual transmission companies, as for production, was dominated by the Norwegian state. For instance, SDFI had shares of 55 percent in Zeepipe, Europipe I and Norne, 60 percent in Europipe II and Franpipe, 46 percent in Åsgard, 51 percent in Oseberg, 65 percent in Heidrun and 58 percent in Draugen. Statoil and Norsk Hydro in addition typically each held 10-15 percent ownership shares. Norpipe and Statpipe were established before the SDFI arrangement was activated. But, Statoil had a corresponding, large share of ownership as the SDFI. With Statoil privatization, SDFI took over the majority also in these lines. The same ownership structures hold for the receiving plants on shore in Norway (Kårstø, Kollsnes, and Tjeldbergodden), and somewhat less in the receiving plants in Emden, Zeebrügge and Dunkerque. In Zeebrügge, Belgian Distrigaz holds 51 percent, while the Zeepipe group owns 49 percent, and in Dunkerque where Gaz de France holds 35 percent compared with Franpipe group's 65 percent (for more details, see MPE annual). In addition to strong infrastructural ownership, the state also strengthened her own position with the establishment of the independent state company Gassco at the expense of Statoil.

In the following we will go in more detail into the change from the "old" transportation system to the new Gassco/Gassled TPA system. The purpose is to show how the Norwegian state with the privatization of Statoil and twin pressures from the EU, proved to be an innovative regulatory entrepreneur capable of changing policy to retain the main elements of the goals of the NGF, including national control, resource management and rent capture, and to prevent that increased competition on the NCS should lead to oversupply the market when it is weak.

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<sup>40</sup> Others also challenged the Norwegian sales and transportation system before the EU. The American company Marathon brought a suit against Ruhrgas in Houston and Statoil in Stavanger, citing unfair transport tariffs on the Norwegian shelf. Marathon owns a share of the Heimdal field, and is dependent on natural gas being sent through the Statpipe system, which had high tariffs and accumulate large profits.

### 3.4.1 The development of the Norwegian natural gas transportation systems

In line with the development of the natural gas fields, a comprehensive system for transportation of gas on and off the Norwegian shelf was also developed.<sup>41</sup> When gas was to be transported from the fields and to a terminal in Norway or abroad, transportation was organized through separate companies. The first natural gas pipelines on the NCS were built in the mid-1970s. Frigg gas with associated fields was sold to BG with agreements from 1973 and 1980 and transported through the pipeline system to St. Fergus in Scotland. These deliveries ended in year 2000 when reserves were depleted. From the Ekofisk field the Phillips group sold gas through contracts from 1973 and 1975 to a buyer group consisting of the Continental transmission companies Ruhrgas, Gasunie, Distrigaz and Gaz de France through the Norpipe system, cf. Figure 2.1.

Statpipe was the next large transportation system built, and came on stream in 1985.<sup>42</sup> Statpipe consisted of 4 separate parts: transportation from the Statfjord field to Kårstø, the gas treatment plant at Kårstø, transportation from Kårstø to the riser platform Draupner and transportation from Draupner to Ekofisk, and later also through Europipe I (1995). From Ekofisk to Emden the gas runs through the Norpipe system together with Ekofisk gas. Heimdal gas was tied to the system at Draupner. Europipe I also transports gas from Draupner to Emden, while Europipe II (1999) transports gas to Emden direct from Kårstø. All together, three transmission systems developed from the Norwegian shelf to Germany with a combined capacity of 50 BCM/year: Norpipe (19 BCM/year), Europipe I (13 BCM/year) and Europipe II (18 BCM/year), cf. map in Figure 3.7.

The Zeepipe system, which was build to transport gas to Zeebrugge in Belgium, like Statpipe, comprises different parts. Phase 1 (1993) goes from the Sleipner field to Zeebrugge in Belgium and between Sleipner and Draupner with a capacity of 13 BCM/year. Phase II (1996/97) consists of two pipelines from

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<sup>41</sup> Most “local” systems, which transport gas between different fields within a production area, are counted as a part of the production infrastructure.

<sup>42</sup> For comprehensive details about fields and infrastructure, ownerships etc on NCS, see MPE annual.

Kollsnes, where the Troll gas is brought on shore, to Sleipner and Draupner platforms respectively. This ties Kollsnes to the export system to the continent. Franpipe was the fifth pipeline to the continent, going from the Draupner platform to Dunkerque in France and was put into operation in 1998 (15 BCM/year). The capacity for delivering gas to the continent through these five pipelines is 78 BCM/year. As of today, there is not much excess transport capacity within these pipelines for further gas sales.

With the Interconnector from Bacton to Zeebrügge, which ties Great Britain to the continental market, Norwegian gas can be exported through the Norwegian and British Frigg pipelines with a total capacity of about 20 BCM, from Great Britain to Zeebrügge. The Langeled pipeline transporting gas from the Ormen Lange field to Easington in the U.K. (2007) is the last major pipeline construction on the NCS. The sale of natural gas to the British has been small for many years because of the phasing out of Frigg gas and the rejection of the Sleipner deal in 1985, cf. Chapter 2.3. With the full start-up of the Langeled system, Norway finally became the major exporter to the U.K again. In 2007, the Snøhvit field in the Barents Sea also started (with great difficulty) supplying gas from the first Norwegian Liquefied Natural Gas (LNG) plant to the U.S. and Europe.

Figure 3.7: Map: Natural Gas Pipelines in Norwegian North Sea  
2007



Source: Norwegian Petroleum Directorate

As transportation in the individual transmission systems were organized through separate companies, it entailed that each owner of gas on the Norwegian shelf had to make an agreement with the individual company about transportation. In most cases, but not all, the licensees for the fields were also included as owners in

the relevant transport infrastructure, and thus ensured access to transportation for themselves. By controlling the infrastructure, production and trade of gas was also controlled. The tariffs for transportation were rather different in the individual transport companies (see discussion below). With the TPA system introduced, and Gassco as the new state operator of the pipelines and tariffs set under Gassled system, free access to transportation should be secured for all parties on equal terms and equivalent to a toll road. By replacing the political interest-based control of infrastructure by a political neutral control of the system, commercial parties should more easily obtain access to each other on both sides of the transmission systems.

Table 3.1: Ownership structure for gas transportation in Gassled 2007

Petoro AS (SDFI)	38,25 %
Statoil ASA	20,18 %
Norsk Hydro Produksjon AS	11,62 %
Total E & P Norge AS	8,09 %
Exxon Mobil Exploration & Production Norway AS	5,30 %
Norske Shell Pipelines AS	4,14 %
Mobil Development Norway AS	4,27 %
Norsea Gas AS	2,84 %
Norske ConocoPhillips AS	1,95 %
Eni Norge AS	1,57 %
A/S Norske Shell	1,12 %
Dong E & P Norge AS	0,07 %

*Source: MPE annual 2007*

MPE (annual – 2007 describes the system in this way:

*“Petoro’s share in Gassled will be increased by approximately 8.4 percent with effect from 1 January 2011, and the other licensees’ shares will be adjusted at the same date. The SDFI share in Norsesea Gas AS is 40.0 percent. When this is taken into account, the state, represented by SDFI, will have a share in Gassled of 39.4 percent in 2003-2010 and 47.5 percent from 2011. The license period for most of Gassled facilities will run until 31. December 2028. The coordinated ownership structure for the most significant parts of the gas infrastructure has laid the foundation for a*

*uniform access regime and will ease administration and daily operation of gas transport in the future. The ownership structure may be adjusted when new facilities and pipelines are incorporated into Gassled"*

### 3.4.2 Transportation tariffs until 2003

In general, individual Norwegian gas transportation companies based the calculation of their invoices to users of their systems on a cost-plus principle, where expenditures on infrastructure, operational costs, interest payments and profits were important components:

$$(i) R_i = O_i + D_i + I_i + P_i .$$

$R_i$  = Total revenue for the transportation company in year i.

$O_i$  = Operational costs in year i.

$D_i$  = Depreciation costs in year i.

$I_i$  = Interest paid in year i.

$P_i$  = Profit in year i.

The tariff as a per unit cost was thus a result of the gross revenue for the transportation company divided by quantity transported:

$Q_i$  = Transported quantity in year i.

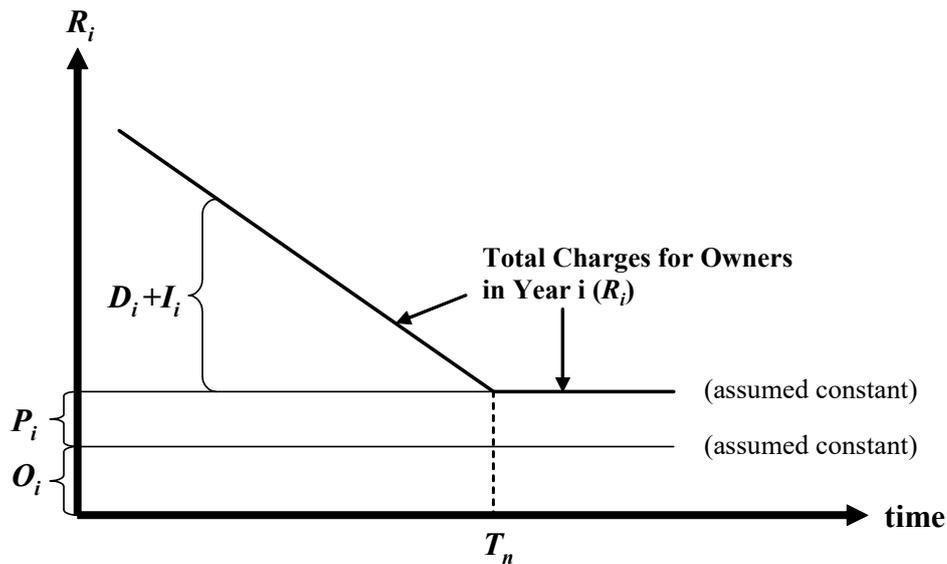
$t_i$  = Tariff per unit gas transported =  $R_i/Q_i$  in year i.

These general principles were however interpreted differently, and most of it was not open information. Only some principles for the Norwegian practice can therefore be discussed (Eik 1983, Austvik 1984).

One "low-tariff" outcome of handling the different tariff elements was the principle that Norpipe applied to transportation of gas owned by the owners of Norpipe (not 3<sup>rd</sup> party tariffs). In this principle, costs for transportation for users dropped in line with depreciation and lower interest payments ( $D_i + I_i$ ). If there were no new investments made in the system, transportation costs would over time include only operating costs and profit to the owners of Norpipe. The profit element was calculated as a percentage of the owners' capital share in the pipeline, relative to the total throughput that the owners are responsible for in the

pipe. Therefore, the owners of Norpipe were sometimes able to transport their own gas very cheaply through the system. In Figure 3.8, both the profit and operational elements are, for simplicity, assumed constant. When depreciated at time  $T_n$ , only the profit element and operational cost mattered for the owner's tariff in this pipeline.

Figure 3.8: Principle for Norpipe owner revenues



A "high-tariff" outcome was the Statpipe practice. The Statpipe system was divided into 4 main zones:

- Zone 1: Statfjord - Kårstø (rich gas)
- Zone 2: Kårstø Extraction (separation)
- Zone 3: Kårstø Fractionation
- Zone 4: Kårstø - Ekofisk (dry gas)

A tariff was calculated for each of the zones. In addition to operational costs, Statpipe calculated a capital element to cover depreciation, interest and profit ( $D + I + P$ ). This element was based on accumulated investments, including capitalized interest payments. 22.7 per cent of this sum gives the annual capital cost element. The basis for the determination of the factor was that depreciation

was to take place over 15 years and that the investments should yield a profit of 5 percent in real value after taxes. This sum was annually adjusted for 70 per cent of Norwegian consumer price index (CPI). Thus, in a given year  $i$ , Statpipe's total revenue, covering the capital element as well as operational costs, was written as:

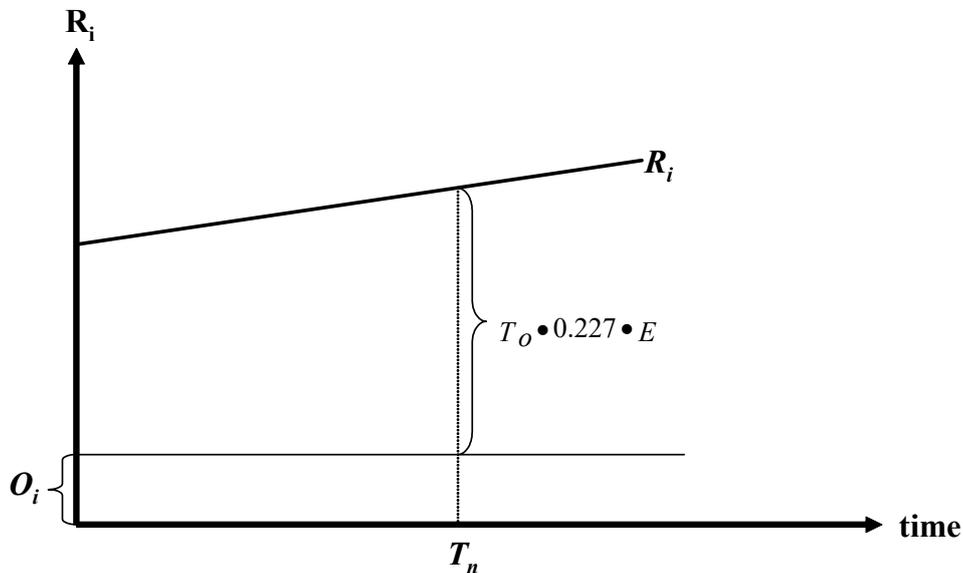
$$(ii) R_i = T_i \cdot 0.227 \cdot E + O_i$$

$T_i$  = Accumulated investments, including capitalized interest payments.

$E$  = Escalation factor (70 percent of the increase in the Norwegian CPI).

For a given transported quantity, Statpipe's tariff consequently increased over time (in nominal terms), while Norpipe's tariff dropped to operational costs and a profit margin. Figure 3.9 illustrates for simplicity a situation assuming constant operational costs, no additional investments made and no activated interest payments for the Statpipe system.

Figure 3.9: Principle of Statpipe revenues



*Assumptions: No additional investments, no activated interest payments, constant inflation in Norway*

Under these assumptions, Statpipe's gross revenues would at time  $T_n$  be the same as the first year adjusted upwards with 70 % of the Norwegian CPI. When

additional investments were added and interest payments capitalized, the curve would make (discrete) jumps upwards (higher gross revenue for Statpipe and nominally a higher tariff). Statpipe then generated a considerable profit for its owners. Measured per cubic meter of gas per km the Statpipe tariff was many times that of Norpipe's, everything else held equal. The other transportation tariff systems on the NCS were designed somewhere in-between these two extremes, mostly on Statpipe's principles, but at more modest levels.

3<sup>rd</sup> parties (those who were not owners of the transmission company in question) had to negotiate a solution. If it concerned "smaller" volumes, i.e. volumes which did not defend the development of a new pipeline, in most cases it led the transmission company (the TSO) to exploit its position and demand higher tariffs from 3<sup>rd</sup> parties than from its owners. For example, 3<sup>rd</sup> party tariffs in Norpipe were considerable higher than owner tariffs. In some cases it was impossible to develop such "smaller" volumes without the formulation of a reasonable transportation solution in advance. The TSO could demand a sum so high from a 3<sup>rd</sup> party that most of the profit remained with the transporter, instead of at the producer. This partly inefficient cost structure (profit left within the transportation segment rather than with the producer) provided a good reason for change, also before the processes started with the EU. At the same time, it was important for the state to collect rent and control the flow of gas. High upstream tariffs make oversupply of gas in weak market situations less likely.

### 3.4.3 The Gassled system from 2003

The Gassled system unified and harmonized transportation tariffs on the NCS, but appears as quite different for up and downstream infrastructures. The principles for the tariffs were presented with the following formula (MPE September 2002):

$$(iii) \quad t = \left( K + \frac{I}{Q} + U \right) \bullet E + \frac{O}{Q}$$

Where:

t = tariff per unit for the right to use the inlet and outlet or a processing plant

K = fixed part of the capital element per unit

I = annual element calculated for investments to maintain the system

Q = estimated aggregate reserved capacity in the year in question

U = element calculated for investments linked with extensions of the system

E = escalation factor for inflation

O = anticipated operating costs

For the individual pipeline systems the elements were determined as follow:

- The K-element varied across areas. For gas through the Kårstø terminal the following tariffs were proposed in 2002 NOK:
  - Area A (Statfjord B-Kårstø):  $K = 5.5 \text{ øre/Sm}^3$ . For Brage and other “old” fields:  $K = 18.0 \text{ øre/Sm}^3$ .
  - Area B (Åsgard B - Kårstø):  $K = 3.5 \text{ øre/Sm}^3$ .
  - Area C (Kårstø Terminal):  $K = 10.0 \text{ øre/Sm}^3$  (extraction) + fractionating, storage, shipping.
  - Area D (Dry Gas Inlets - Continent/UK): Inlet:  $K = 2 \text{ øre/Sm}^3$ . Outlet (- exemptions):  $K = 12.5 \text{ øre/Sm}^3$  (->2006),  $8.5 \text{ øre/Sm}^3$  (2007-2010),  $6.0 \text{ øre/Sm}^3$  (2011->)
- The operator (Gassco) should estimate the Q-element at the beginning of each year.
- The I- and U-elements should both be determined by the MPE and

*“be included in the tariffs for the area which necessitates the investment” (ibid.).*

- The I-element

*“shall be calculated as an annuity within the remaining term of the license so that a reasonable return on the investment can be expected” (ibid.).*

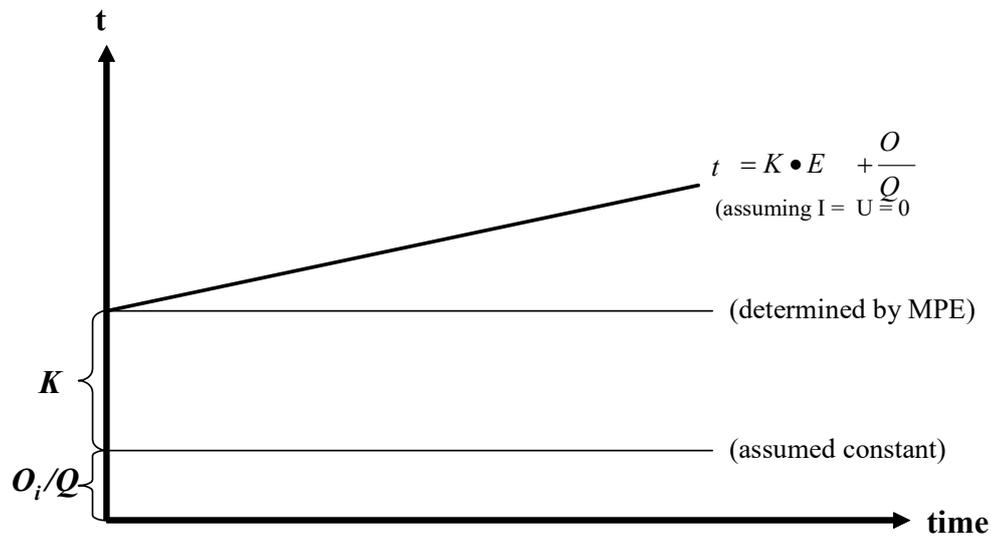
- The U-element shall also be calculated as an annuity so that a “reasonable” return on the investment might be expected. How much this will affect the U-element in the tariff to individual users depends on whether or not they triggered the expansion of the system. There is a cap on 0.6-0.7 øre/Sm<sup>3</sup> for established users that did not trigger the U investment.

*“If this U is not sufficient to give the above-mentioned return on the investments in expanding capacity, the Ministry shall determine an [additional tariff] for the users for whom the expansion was necessary” (ibid.).*

- The MPE could alter the rate of return constrain in accordance with the Petroleum Regulations.
- The escalation factor E was set equal to the change in Norwegian CPI (1:1).
- The formula was presented as a per unit tariff and would in nominal terms change primarily with the escalation factor. However, the I, U and O-elements will also change according to how much capacity is reserved. The U-element will/may in addition vary with participation in an expansion of the system. There was no cap set on the tariff on these elements, in case load factors decreased.

In Figure 3.10 the (nominal) development of the Gassled tariff is shown in principle for areas A, B and C (upstream). For simplicity, we have assumed constant operational costs, volumes booked and inflation and no investments made in maintenance or expansion of the system.

Figure 3.10: Principle of Gassled tariff areas A, B, C



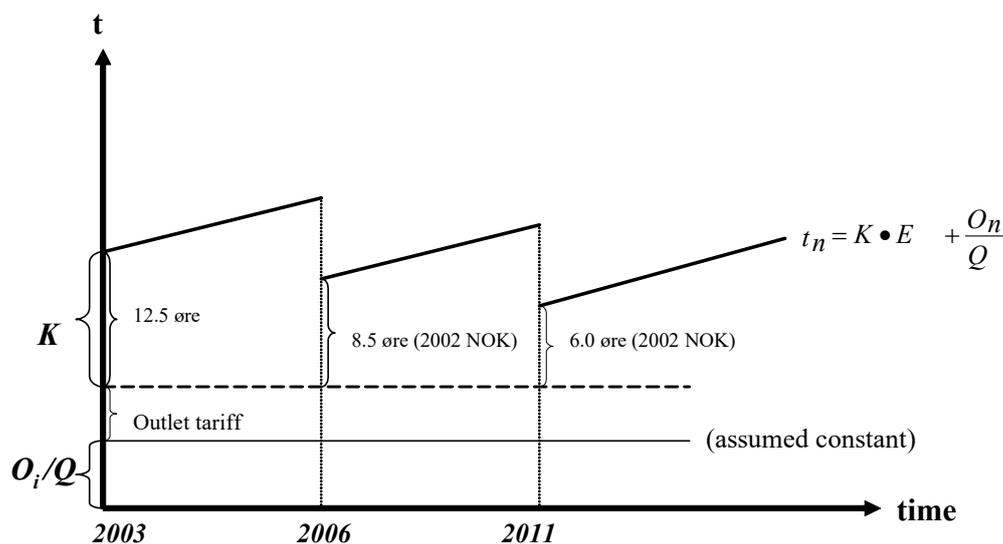
*Assumptions: Constant operational costs, volumes booked and inflation. No investments made in maintenance or expansion of the system*

If investments are made in maintaining the system ( $I > 0$ ) within one of the areas, the tariff will increase for all, although not significantly. If investments in expanding the system are made ( $U > 0$ ), the tariff for all within this area will increase, but there is a cap (0.6-0.7 øre/Sm<sup>3</sup>) on how much it can increase. The users in need of the expansion will carry the remaining part of the tariff increase. When I- or U-costs are added to initial costs (represented by the K-element), the curve will make (discrete) jumps upwards (a higher tariff).

The “old” Statpipe formula implicitly set the K-element to a percentage of investment costs (22.7%). Investment costs in Statpipe meant accumulated investments and activation of interest payments. In the Gassled system areas A, B and C the K-element is not assumed to change over time, and new investments are not accumulated in the same way, as in the Statpipe formula. Nevertheless, the principle for the Gassled tariff for area A, B and C reminds more of Statpipe principles than the “old” depreciated Norpipe owner’s tariff. At the same time, the escalation factor E is 1:1 compared to the Norwegian CPI in the Gassled

system, as opposed to 0.7:1 in the Statpipe system. Gassled tariffs should then, *ceteris paribus*, increase more rapidly than Statpipe tariffs in these areas.

Figure 3.11: Principle of Gassled tariff area D



*Assumptions: Constant operational costs, volumes booked and inflation. No investments made in maintenance or expansion of the system*

In Figure 3.11, the (nominal) development of the Gassled tariff is shown in principle for area D (downstream). Again, we have assumed constant operational costs, volumes booked and inflation and no investments made in maintenance or expansion of the system. A difference from the tariffs for areas A, B and C is that the K-element is adjusted down in 2006 and 2011. Thus, area D tariffs have elements that remind of the Norpipe owner's tariff, although it is higher. In nominal terms the tariff for area D may over time fall or rise (or remain stable as a special outcome), depending on the Norwegian rate of inflation.

The general picture is that tariff principles in upstream rich gas systems (areas A, B and C) were to a large extent maintained. In the dry gas systems (area D), tariffs may in periods be lower than before. To a large extent the system gained a new and more flexible form, with strengthened direct government control of the system (and not through Statoil anymore) and most of the economic structure maintained.

By *de jure* accepting the gas directive's principles and adapting to it through more direct state participation (Gassled, Gassco, MPE), largely at Statoil's expense, Norway increased EU's Win-Set in terms of formality. The same was the case when establishing Petoro. The EU on her side, expanded Norway's Win-Set by accepting her form of adaptation. Norway could more easily accept EU principles when *de facto* adaptation was largely left to the MPE, and not the EU. Consequently, the pressure was formally settled with the result that things should be done differently than before, but the new instruments and regulations would to a large extent maintain important NGF goals. Transportation of gas became more flexible and open, which was also a response to industrial (and market) maturity and heterogeneity. The EEA agreement allowed for the continued and (even) increased state control of transportation infrastructure, through new state companies and regulations. While principles appeared to be important to the EU, these principles were eventually accepted by Norway, as it made it possible to maintain important control mechanisms and policy goals.

A lesson learned is that although the EEA agreement leads to more decision-making by independent market actors, it can also lead to more state involvement when national interests are at stake. In addition, the adaptation to a new situation may be as important as the agreement itself when *de facto* effects are to be assessed, cf. Chapter 3.6, Chapter 5.2, Chapter 5.6, and Chapter 6.3. Making a transportation tariff system that maintained much of the structure from the fields and to (and including) the terminals, while opening it more for downstream sales, was considered important to Norwegian upstream control and downstream engagements. It was also important for the efficiency of the largely matured infrastructural system. The Norwegian "factory gates" for natural gas were however largely *de facto* moved from terminals on the Continent to Norwegian terminals, although formally to the fields of production.

### **3.5 The EEA agreement and Norwegian petroleum policy**

The EEA agreement's impact on the Norwegian petroleum industry represents a broader political change. In general, state relations to the industry and to purchasing countries and companies have become less direct and more regulative and, in relation to other countries, secured more through general diplomatic

channels and within general political frameworks to support industrial activities. This is in contrast to when the state was represented by the MPE and directly involved in gas contracting through Statoil and the GFU.

A similar tension over legal aspects concerning Norwegian petroleum policy emanating from the EEA agreement as with GFU/FU-issues, arose when Norway decided to support OPEC efforts to reduce production, in order to stabilize prices in 2001, although not equally controversial. In the OPEC case, the European Commission charged Norway with contravention of Article 12 of the EEA Agreement, which prohibits quantitative restrictions on exports, as well as competition provisions of the EEA agreement. Norwegians however, considered that

*“petroleum produced on the NCS should (consequently) not be regarded as an EEA product” (Arnesen 1995:528, my translation).*

*“Non-discriminatory regulations of production (and exports) should not conflict with EEA rules” (ibid:530-539, my translation).*

Nevertheless, the Commission wanted to highlight Norway’s failure to notify its action to the appropriate EEA forum. The situation did not lead to a case before the EFTA Court,

*“since the EU itself has an interest in oil price stability” (Emerson, Vahl and Woolcock 2002:13).*

This tension in Norway’s relations to the EU might however, return to haunt a weak oil market situation at a later point in time. Norway desires the freedom to interplay with OPEC, as she has done since 1986 (Austvik 1989),

*“while it is very formally associated with the EU. There can be times when the two relationships do not ride well together” (Emerson, Vahl and Woolcock 2002:13).*

Any similar interplay with Russia in the future with the goal of stabilizing European gas prices in a weak market situation would certainly be met with much harsher reactions from the EU than was the case in the OPEC example above.

The EEA agreement has contributed to change constellations of domestic actors relevant for petroleum policy formation. Within the government the MFA

has returned as a more important ministry, as it was in the 1960s and 1970s when the process around the law of the sea contributed to the development of the emerging Norwegian petroleum sector at the time. As a consequence, from 2007 the MFA has started to develop her own oil and gas expertise to deal with a number of foreign relations where Norwegian petroleum is involved. The Norwegian Ministry of Justice and its sub-organs have in the areas where the EEA agreement largely applies, gone from being a domestic law-maker to an external law-taker, and in relevant cases override what the MPE otherwise would have done in the petroleum sector. Before the EEA agreement came into effect, the MPE would rather ask the Ministry of Justice to make laws that supported her stated policy objectives.

Policies concerning the Single Market are mostly concentrated on non-discriminatory practices and fair competition for individuals and firms. While being *de facto* strongly focused on the role of the entrepreneurial Norwegian state as an explanation for natural gas (and oil) market imperfections in her petroleum sector, the EEA agreement has not challenged the role of the state as the dominant owner, the main capitalist in the sector and the establishment of more state agencies (Petoro and Gassco). The heavy taxation system and the arrangement with the SDFI to capture a maximum share of the economic rent for the state have been maintained. It may however be set under stronger pressure from commercial companies in the future, including StatoilHydro, who now primarily seek to optimize their own interests.

Both privatization and EU pressure induced new government-company relationships and made Statoil more independent from the government. As the company became “only commercial”, questions gradually re-emerged, as in the early 1980s, about whether the government had also become the “junior partner to business” in petroleum policy, cf. Chapter 2.6. The EEA agreement contributed also to increased competition with following pressure for further policy harmonization and regrouping of domestic actors. One example was when Statoil and Hydro, and not the government, took the initiative to merge in 2006/2007, cf. Chapter 2.1. Statoil even suggested that it should claw back the SDFI shares that were taken away politically in 1984, in order to become internationally competitive (it would have made it the fourth biggest oil company in the world in

terms of production at the time). With its privatization, the perspective for Statoil became more shortsighted as the capital market, rather than political decision-making, was to guide corporate strategy. Foreign (liberal oriented) consulting firms analyzed the best form of action for the Norwegian government (MPE), rather than nationally oriented politicians.

International ideological change together with industrial and market maturity, contributed to moving power over petroleum industry in the direction of the industry itself. The second political wing-clipping of Statoil occurred with the establishment of Petoro and Gassco, together with its self-initiated privatization. This gave Statoil (intended) greater freedom, not only to go abroad, but also to influence policy and to act as grown cuckoo at home. Business oriented interests will usually be given a stronger say in policy formation in a more liberal market design, cf. Chapter 1.5. However, to a large extent, the formal position of the government was not changed in 2001/2002, other than that she was still able to exercise strong authority over domestic petroleum policy, as well as towards StatoilHydro as a company, if she so desires.

The removed production restraints resulting from the existence of the Petroleum Fund increased the domestic maneuvering room for the natural gas entrepreneur and contributed to make it more difficult *not* to follow EU wishes for increased production (the Norwegian Win-Set has on this issue become larger). From a social point of view, Norway could however rather delay production, start thinking more about other economic activities than oil and gas, and become less dependent on the sector than she is by maximizing production. Petroleum investments on the NCS are however now the highest ever and natural gas production is expected to increase to 120-140 BCM in a few years time; higher than anyone believed a few years ago. These are in line with consuming countries ("short term") interests, but not necessarily with Norwegian nor EU long-term interests, cf. Chapter 5.4. The opportunity costs of increasing investments in oil and gas activities are for Norway to await investments in other areas. EU interests pressure for more short term optimization in Norwegian petroleum policy than what her long-term interests may indicate. At the same time, the

*“EEA turns out to be very different from what was initially envisaged. First the defections of Austria, Finland, Sweden and Switzerland came (in their different directions,) as well as the second negative outcome in Norway’s latest referendum over EU accession. Secondly, the EU itself has changed with the start of monetary union and the development of new competences in foreign, security and defense policy and justice and home affairs. Norway is accordingly extending its association relationships with the EU outside the EEA” (Emerson, Vahl and Woolcock 2002:i).*

Furthermore, the huge enlargement of the EU into Central and Eastern Europe have made the EEA a smaller part of the EU’s wider European agenda. The EEA is not always the right forum to deal with the new policy areas with different roles for the Commission, Parliament and Council according to the pillar concerned. The EU remains the policy-maker and Norway the policy-taker, causing logical discontent in Norway over questions of democratic legitimacy, transparency and accountability in her relations with the EU.

*“On the other hand, a debate is developing over a wider ‘Common European Economic Space’, notably between the EU and Russia as a result of summit-level orientations. While the operational content of this new idea is unknown at this stage, if it were to be developed seriously it could head in the direction, amongst others, of the mechanisms of the EEA” (ibid.).*

The realist / economic nationalist approach taken by the Russians in the development of her petroleum sector over the past years make it however, less likely that she will adhere to an EEA type of agreement with the EU; even though this might be preferable for the EU. It seems more likely that Iceland joins the EU, and leave Norway and Lichtenstein on their own with the EEA agreement. It is possible that this will lead to the end of the agreement, and Norway will have to choose between full EU membership and the Swiss-EU model of sector-specific agreements. Whatever developments take place in the formal relations between the EU, its member countries, Norway and other countries, hitherto Norwegian experience in the petroleum sector indicates however that the maneuvering room for *de facto* national influence on and adaptation to EU rules and regulations are greater when national interests have to be defended, than is often the case in Norwegian political debate.

Another question is whether Norway would manage to build a nationally controlled petroleum industry if the resources were discovered today and not in the 1970s. Within an international framework it would be possible to establish a state oil company. However, it would be difficult to give this company the best licenses and not to initially more efficient foreign competitors. It would be especially difficult to discriminate in favor of the Norwegian supply industry. At the same time, Norway has shown that the support for the petroleum industry in the 1970s and 1980s was for an industry in its infancy. It was an infantile and not a “senile” industry that indirectly and directly was supported. From the beginning it would have been worth while trying to negotiate with the EU and WTO, and argue in favor of transition arrangements to build a national oil industry. Realpolitik indicates however that the huge economic interests involved would make such an approach of the utmost difficulty.<sup>43</sup>

### **3.6 The EEA agreement and the state’s natural gas entrepreneurship**

With the EEA agreement Norway adopted much EU core policy in terms of market regulations and competition law, which legally limited the state’s domestic room for maneuver as a natural gas entrepreneur. Increased competitive pressure was also put on the Norwegian industry. Both legal and competitive forces led eventually towards a harmonization of political institutions, and in many cases made them execute policies defined by the agreement and common institutions (ESA).

The EEA agreement stressed that national law and business operations were to take place according to Single Markets rules and regulations. Norway was forced to adapt to the gas directive and introduce TPA on the NCS, as well as to obey EU understanding of EU competition law and abolish the GFU and FU

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<sup>43</sup> Norway is however, not without power through the large petroleum resources on the NCS (Claes 2003b). Norway has of course fewer possibilities when it comes to exerting an influence on international rules, than for example Russia. But her impact as the world’s third largest petroleum exporter should necessarily be considered greater than zero. Russia on the other hand, wishes to arrange her petro industrial system according to the Kremlin’s desires, partly through the industrial “monster” Gazprom (Russian Energy Weekly 2005). At the same time, Russia is increasingly using her enormous energy reserves to regain international political power. This is in a manner different to small state Norway, cf. Chapter 5.3.3-4.

arrangements. This study argues that Norway to a large extent managed to reorganize her natural gas model in accordance with the new situation, without losing the central components of her entrepreneurial ability. This was in spite of her “legal defeats”. Institutions changed but the state remained largely at the helm, both in terms of gas sales (albeit not 100 % anymore) and in terms of controlling the transportation infrastructure (although changed).

ESAs evaluation of the GFU system was colored by formality, but also by the interests of Norway and her bargaining with the EU system. The acceptance of the StatoilHydro merger in 2007, which formally increased seller concentration of Norwegian gas, and the company’s continued sales of SDFI gas, has similarly not been met by criticism from the EU. In addition to the fact that the EEA agreement allows for establishment of new fully owned state companies, as part of an overall regulatory framework, this indicates that to date EU regulations in this sector have in sum ended up being more about form than substance. This conclusion is supported by a number of downstream impediments on the Continent compared to the purposes of the gas directives and EU competition law, cf. Chapter 4.8, 5.2 and 5.6. This means that they to a large extent represents changes where

*“‘fuzzy liberalization’ – universal free-market rules that are open to a wide range of interpretations by governments, companies and the courts – is becoming the norm, even when there is broad agreement on liberal market principles” (Andersen and Sitter 2009).*

The Norwegian - EU discussions about abolishing the GFU and introducing TPA on the NCS was close to ending up with the first Norwegian veto against implementing EU competition law and regulations. At the same time, the EU wanted to issue large fines against Norway for breaking the rules (the SO, cf. Chapter 2.5). In sum, the Norwegian and EU Win-Sets could initially be considered not to overlap, cf. Figure 1.5. The solution eventually reached was that Norway adapted formally to EU rules and regulations, and at the same time, gave them a content reflecting Norwegian interests. In this way a deal was settled. The formal Win-Sets were enlarged for both while the *de facto* content was not changed too much for Norway compared to her maintenance of the main

purposes of the NGF. The manner in which her entrepreneurship was exercised was however changed from interventionist towards more regulative.

The effects on the NGF from the EEA agreement are particularly concerned with the maneuvering room and options for *domestic* policy formulation. The *legal bindings* coming with the agreement forced Norway to import general EU competition law and specific regulations (directives). The strength of nationally defined regulations and protection of the functioning of and framework for the domestic markets to support the Norwegian supply industry and oil companies were changed, and to some extent weakened. The EEA agreement ended for example the policy of choosing development concepts and materials specifically designed to fit the Norwegian supply industry (Arnesen 1995:343-393), which actually was a *de facto* protectionist measure in favor of Norwegian suppliers. The number of international oil companies has increased on the NCS in terms of licenses and activity level, even though they are often employed with tale production and smaller fields. The preferential treatment as well as the governmental control of the state oil company Statoil/StatoilHydro is weakened, even though Norway maintained much of the entrepreneurial initiative through regulatory innovation; through the way she reorganized her natural gas activities to ensure ownership dominance and a state controlled infrastructure. Nevertheless, Norway has become more limited in her freedom to choose natural gas policy than other exporters, but the change is less dramatic than extreme scenarios including full liberalization models, cf. Chapter 4.3.

The EEA-agreement states that when others than the state are granted access to an economic activity, they should be given such access on a non-discriminatory basis (independent of nationality). The agreement sets limits for the content of normative political measures; non-discriminatory restrictions are allowed, while discrimination between firms and persons is not allowed, independently of whether it is a state or a private firm that runs the business. The result of the agreement is that more decisions are made by independent market actors according to proper non-discriminatory regulations. Previous interventions, such as preferences for Norwegian companies in concession rounds and the control of the sale of natural gas (through Statoil and the GFU) are terminated, as in conflict with EU competition law.

The government can however still exercise and maintain national control in the petroleum sector under the EEA agreement by regulating access to the industry (because she owns the resources) and by running an activity herself. Control can also be exercised through active ownership in relevant enterprises, such as in StatoilHydro by telling or agreeing with them about what to do, albeit more weakly than with a state company. Proper resource management does not conflict with the agreement, and nor does the existence of high SDFI shares or the (non-discriminatory) petroleum tax system. What has changed is that national goals can no longer be reached by normative political means alone, but must be complemented by the state as an actor and regulator, respectively, in relevant situations. The result of the EEA agreement is that more decisions are made by independent market actors. But, as Arnesen (1995:539) states, there can also be more state involvement when national interests are defended. Norway made a new balance between the state and markets when Statoil was privatized and the EU pressures arose.

Claes (2002b) studied the processes of Europeanization and how four types of cumulative factors influenced how Norway has adapted to the EU energy sector in the Single Market: affectedness, policy similarities, bargaining opportunities and legal proceedings. He found that

*"there is considerable variation in domestic adaptation to the EU even within the case of Norwegian energy adaptation"... due to "variations in the policy fits and misfits, but more interestingly due to the dynamic interactions between actors' interests and the institutional aspects of the adaptation processes" (ibid:306).*

While the price transparency (EU 1990), the concession (EU 1994) and the electricity (EU 1997a) directives did not qualify much for a Norwegian policy adaptation because of either low affectedness, bargaining opportunities or (existing) policy similarities, respectively, Claes found that the gas directive (EU 1998) represented a strong conflicting interest, especially when Norway did not obtain bargaining opportunities. Norway was forced to adapt to the gas directive and introduce TPA on the NCS, as well as to EU competition law and to abolish the GFU and FU arrangements.

We have however discussed how Norway to a large extent managed to adapt to the new situation, without losing the essentials of its entrepreneurial purpose when reorganizing the system and making her gas model comply with EU directives and competition law.

*“The complexity of the petroleum sector implies that when a judicial review of whether a measure is necessary to take care of the concerns in which it is anchored, doubtfully will be very intense.”*

*The “ESA will most doubtfully be able to deal with other than striking violation of rules” (Arnesen 1995:662, my translation).*

To some extent this is also true in the EU itself:

*“The ‘fuzziness’ of the rules have meant that even court cases against national import/export monopolies are only met with partial success” (Andersen and Sitter 2009).*

EU regulations and rules can be ‘translated’ into domestic policy changes over time. The pressure from EU integration processes aimed at bringing the petroleum sector more in line with how other sectors are managed politically. Strong political interests wanted to maintain the Norwegian system and

*“the petroleum wealth made reform needs less acute than in many other countries, and reform processes started relatively late” (Olsen 1996, my translation).*

Norway had the financial strength to afford waiting to avoid undesired outcomes, at the same time as there was less domestic and revenue need for restructuring. The bargaining going on between Norway and the EU ended with the acceptance of EU procedures (no bargaining opportunities about Single Market principles). However, the implementation of rules and directives was more a-la-Norvége, in line with Katzenstein’s (1985) assumption that small states can adjust better to international change than large states and organizations. The natural gas sector is in relative terms more important to Norway than to the EU, leaving it higher up on the Norwegian political agenda than for the EU.<sup>44</sup>

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<sup>44</sup> This is however also the case in this sector for many member countries.

In the case of natural gas, the Norwegian government had an interest that gas sales should be controlled from an as strong a position as possible vis-à-vis EU purchasers, on behalf of her treasury, as well as the industry. Norway wanted reciprocal free trade for most goods and services, but not necessarily in all aspects of natural gas trade. For the Norwegian natural gas entrepreneurship the MPE was a strong bureaucratic agency for policy making, not limiting herself to act in a Misesian or Weberian way, cf. Chapter 1.1. The defending of the interests of the national natural gas industry and the state's resource rent capturing was not in conflict with the rest of the economy, but rather with foreign companies and governments. This made it a non-controversial *domestic* issue (rather the opposite). The cost-benefit analysis looks different when optimizing interests for the EU, rather than for Norway, cf. the discussion around Figure 1.2, and it represents in part a conflict of interest between EU countries and Norway, and not primarily within Norway, as would be the general case for trade liberalization, cf. Chapter 1.2. The EEA agreement changed the maneuvering room for this policy. The state bureaucracy resisted changes for long time and ended up with a solution adjusted to new political, market and industrial realities.

The result did not even reach up to the AB line in the discussion of the behavior of a democracy with strongly defined national interests affected by exogenous changes in Figure 1.3. If the pressures for harmonization towards the same type of liberal market design is maintained as a goal in the EU, cf. Chapter 4.3, one should expect policy to change more in the future along with the long-term AB path, most likely in discrete ways. If however, the EU modifies policy in this sector or policy *de facto* remains incomplete to realize a fully liberalized market, cf. Chapter 5.2-5, point B will move towards point A in Figure 1.3 (and line cc in Figure 3.6) and the difference between the systems will be reduced and their relation changed (more policy similarity because the EU changes). The pressure for policy convergence with the EU will be weaker, and it will be an open question if the Norwegian political natural gas entrepreneurship must change more than it did. Possible further changes in the NGF will as a consequence depend upon EU developments in general, and her design of the natural gas market in particular.

The EEA agreement also created opportunities for up and downstream integration for gas companies. The existing integrated market for natural gas as a product was extended to comprise also markets for production factors and direct investments. Increased competition together with non-discriminatory legal restrictions heightened the difficulties of politically favoring Norwegian companies on the NCS in terms of awarding licenses, positions suiting the supply industry and in gas contracting. As much new investment takes place now are in smaller fields, this is much more in keeping with Norwegian interests than in the period when licenses for the huge fields were awarded. On the other hand, if new huge fields are found in the future, one would expect that the MPE would once again find StatoilHydro “best fit” for their development, and that the state itself, through the SDFI, would once again seek to secure large shares in attractive licenses.

The integration with the EU modified the nationally defined *ideological* platform for industrial and social goals of petroleum activities. The move was towards more liberal ideas, as compared to how it was defined for the petroleum industry in the 10 Oil Commandments and practiced in the 1970s and 1980s. National and social interests have become less explicitly voiced. Already in the early 1990s, attitudes that the state should hold a weaker and more regulative political hand on industrial policy began to inform policy in Norway. At the same time, as the EEA agreement was signed, a government report stated that state control should

*“mainly be executed through laws, provisions and other administrative measures”*,

rather than through direct interventions (Stortingsmelding 1993-1994). The process of integration with the EU strengthened liberal ideology and an emphasis on NPM type of policies in general, also in the petroleum sector. Still however, the Norwegian state holds a must stronger regulative and partly interventionist hand on this industry, as compared with other industries.

At the same time, the domestic political picture has become much more diverse than in the 1970s and 1980s. National disagreement over the question as to whether or not to join the EU as a full member has contributed to this

fragmentation, as well as the speeding up of international (including in EU) economic integration. The strength and scope of the state's natural gas entrepreneurship is influenced by the strength of nationally defined interests over policy and the degree of domestic consensus about these interests. Ideological effects, regrouping of domestic actors and political fragmentation indicate that the Norwegian petro-political consensus over the role of a strong state has been weakened.

*“The Norwegian state is fragmented compared to an ideal picture of democratic governance through representative and executive organs. It is also more fragmented than the systems for governance that might be the case in other countries” (Tranøy and Østerud 2001b:7, my translation).*

The tradition has been to look for broad compromises across institutions and political parties and a bureaucracy (MPE) that formulated policy. Only in foreign and security policy areas were otherwise consensus procedures explicitly sought. Now, initiatives for change were taken by company interests and the EU, in what was a radically changed liberal ideological environment. While the OPEC revolution gave strong support for independent national policy making in the 1970s, the liberal international sphere of the 1990s provided disincentives. On the other hand, Norwegian natural gas interests are generally shared by all political parties as they do not represent intra-Norway economic interest conflicts to any significant degree. Natural gas policy goals towards the EU tend to be less debated in Norway than (domestic) petroleum policy in general.

The *foreign policy* balance between major international political powers as represented by political allies in the IEA and economic interest partners in other oil and gas producing nations, have, on the margin, become less independently formulated and in the direction of EU interests. The new balance concerning Norwegian involvement in Russian oil and gas activities is more influenced by EU interests than was the case before. Any interplay with the Russians to stabilize gas prices in the European market will be met by the EU on both ideological and legal grounds. There is however a tension within the EU, as to whether it is she or the individual member countries that should deal politically with Russia on energy matters. It is not clear to what extent Norway in the future will deal with

national EU governments or EU authorities in situations where gas trade becomes a politically controversial issue and exerts an affect on Norwegian interests. In such cases her relations to the EU (and EU countries) must be expanded beyond the EEA agreement. How far a common foreign and security policy will evolve in the EU is important for the EU-Russian relationship. Also at stake is how Norwegian gas policy should deal with the Norwegian-Russian relationship if and when developing gas fields in the Barents Sea, especially on the Russian side, e.g. in the StatoilHydro 24 % share of Shtokman Developing Company (SDC) permitted by Gazprom in the fall of 2007. Norway needs support from the EU and EU countries (and the U.S.) in order to secure and develop such engagements, and should preferably try simultaneously to “ride all horses”.

The impacts discussed above however must be assessed in relation to changes in other political, as well as non-political factors as outlined in the Introduction Chapter. These concerns general international economic and political trends after the fall of the Soviet Union in 1991; the maturity of both the EU gas market and the Norwegian petroleum industry compared to the 1970s and the 1980s; the changing profitability of the industry as costs and prices change; and the attention to security-of-supply issues. It is the simultaneous dynamisms of EU integration processes and the other factors that together give rise to policy change and outcomes on the basis of its implementation. A relevant contra factual question is consequently, what would have happened with the NGF if Norway had not entered the EEA agreement, and instead chosen the Swiss model or full membership, respectively, for her EU relations.

When entering into the EEA Treaty, both the international and domestic situations were substantially changed for Norway, as compared with the early years when it was the state that took the initiatives to create Statoil, separate out the SDFI shares, and make the GFU and FU arrangements, cf. Chapter 2. In the short run the adaptation to the EEA agreement in the petroleum sector

*“changed procedures, transferred authority from one political body to another, and increased the juridical framing of political decisions. The state’s role as sovereign owner of the resources, the amount of state ownership in the Norwegian companies,*

*and the government's role as granter of concessions have not been undermined by the EU" (Claes 2003a:56).*

*"Based on the character and force of external changes, the domestic effects seem modest" (ibid:58).*

*"Many changes in Norwegian politics would most likely have also taken place without the EEA agreement" (Claes and Tranøy 1999, my translation).*

The impacts of exogenous changes were heavily colored by incumbent ideology and government institutions (such as the MPE and NPD):

*"... history is path dependent in the sense that the character of current institutions depends not only on current conditions but also in the historical path of institutional developments" (March and Olsen 1998:959).*

This path dependency includes strong elements of stability, predictability and sustainability. In the long run the EEA agreement may continue to weaken the state's ability to intervene in oil and gas affairs, but the debate over the degree and scope of policy that best serves a liberal society's competitive situation will continue, not to say that the liberal idea as such of framing economic and political affairs may be modified, cf. Chapter 1.7. In the case of natural gas, the difference to a Swiss model and full membership would most likely have been of modest significance.

The hitherto imperfect market liberalization efforts in the EU and the ever-present obstacles to reach a straight-forward liberal market design have impacts on the scope of the Norwegian state's political entrepreneurship in the natural gas sector. A central task for the entrepreneur is to be alert to shifts in prices, market situations and degrees and scope of changes in political regulations, interventions and institutions that will affect entrepreneurial opportunities (Kirzner 1999). The maneuvering room for political entrepreneurship when exporting natural gas to the EU can be assumed to be larger the more imperfect are EU markets and politics, as compared to an idealized competitive market and regulatory design. If a full liberalization of the market takes place, Norwegian natural gas policy ought to be designed differently to a situation in which the market remains imperfect. Chapter 4 discusses impacts on the Norwegian state's natural gas entrepreneurship in the case of a more or less full liberalization of the

### 3 *The EEA agreement changes the natural gas entrepreneurship*

EU gas market. Chapter 5 outlines several constraints to full market liberalization and discusses the subsequent modifying impacts on the entrepreneurship.

## **4 Market liberalization and the entrepreneurial role of the state**

This chapter focuses on how a largely fully liberalized EU market for natural gas affects the entrepreneurial role of the Norwegian state. To begin with, the main features of European gas market developments over the past 40 years are briefly outlined. Secondly, the goals for market liberalization and the boundaries between regulation and competition in a liberal market design are discussed. Thirdly, a description of how a perfectly liberalized European gas market might look is presented. Fourthly, effects on prices from market liberalization are discussed. Fifthly, impacts on contractual forms and modulation are reviewed. Sixthly, hitherto EU efforts to liberalize the natural gas market are reviewed. Seventhly, an analysis of the effects of natural gas usage taxes, which the EU has been working on parallel to market liberalization initiatives, is provided. And finally, remarks on how full market liberalization influences the Norwegian state's natural gas entrepreneurship are put forward. Challenges for the EU in the field of energy and obstacles to complete market liberalization, and their modifying consequences for the political entrepreneurship are discussed in Chapter 5.

### **4.1 Main features of the European gas market**

Although production of oil and gas share many similarities, land-based natural gas markets differ from the oil market by the large and irreversible investments that are made in gas transportation. When investments in transmission, storage capacity and distribution are made, the larger part of transportation costs are determined. Operating costs are usually relatively low compared to capital costs. A high or low degree of utilization (the 'load factor') affects costs per transported unit directly, but does not affect total costs of transportation much. Large-scale operations are important for realizing investments that bring gas to the market.

The advantages of large-scale operation and vertical integration imply that few companies operate as gas transporters in any gas market. Consequently, most markets for natural gas are non-competitive, cf. Chapter 5.5.

Due to transportation costs, as of yet there is not one global natural gas market, as is the case with crude oil. Regional markets with rather different features and pricing mechanisms have been developed. The three most important natural gas markets are today:

- The *Asian market*, which up to now has mainly consisted of LNG imported to Japan, South Korea and Taiwan from Indonesia, Malaysia, Australia and Qatar. China and India are emerging as new giant Asian markets for LNG.
- The *North American market*, with largely dry gas through the transmission systems of Canada, the U.S. and Mexico. There are plans for substantial expansion of LNG imports.
- The *European market*, which mainly is based on dry gas passing through transmission systems stretching across Europe and Russia. There is also pipeline gas and LNG from North Africa.

Prices in these market should over time converge, although not equalize, with the rapid global growth in LNG transportation. Costs of LNG are heavily linked to investments in liquidification and gasification plants, respectively, and on shipping costs of LNG transportation. Over long distances, gas can be more cheaply transported as LNG than through pipelines, cf. Figure 5.1. The regional markets may gradually integrate as gas is sent between Atlantic and Asian markets. Possible future pipeline links between Asian and European markets through Russia and Central Asia could also lead to price convergence. Table 4.1 shows the price development in the main regional markets for the period 1984-2007, and that to some extent their convergence has already started.

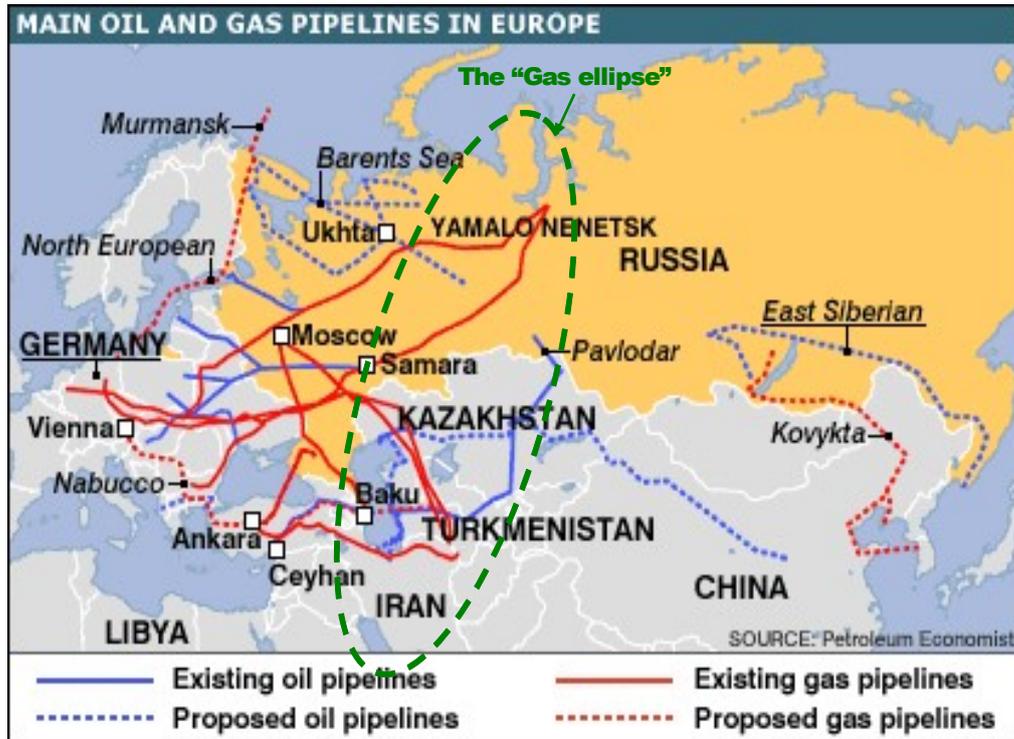
Many European countries have domestic gas production, but this is mostly small scale relative to consumption. The main exception is the Netherlands, which is the only natural gas exporter within the EU. Also the UK has significant domestic production, but is now a net importer (Norwegian gas). The growth in

consumption in the EU is mainly covered by import from four countries that are not members of the Union: Norway, Algeria, Libya and Russia.

The high transportation costs mean that resources which are to supply the EU market by pipeline today are limited to distances of up to some 5000 km from the area of consumption. Russia remains the most important country on the supply side. Russia is the world's largest owner of natural gas resources and is also the largest producer and exporter. About one third of world gas resources are located in Western Siberia. A lot of gas is already being sent from this area to the Russian, the Commonwealth of Independent States (CIS) and European markets. The Persian Gulf area (especially Iran and Qatar) and Central Asia (Turkmenistan, Kazakhstan and Azerbaijan) also have large gas reserves. In spite of the shorter distance to Europe than for Siberian gas, there are no sales of gas from these areas to the EU as of yet. This is largely due to political conditions and difficult transit routes through Caucasus and Turkey. If however the Nabucco pipeline system is constructed (through this area and the Balkans) this may change ([www.nabucco-transmission.com](http://www.nabucco-transmission.com)).

Russian, Caspian and Persian Gulf natural gas are forming a "Gas Ellipse" that together locates some 2/3 of world proven natural gas reserves. These countries can over time chose to send gas to the East or to the West, such that Europe and Asia will increasingly compete for resources, cf. Figure 4.1. West Africa, and in particular, Nigeria might also in the future send gas to Europe, preferably as LNG. Some gas is already coming from the Caribbean, but these volumes can never be significant relative to total consumption in any European country. The closest area to increase exports to Europe is North Africa, and Libya became the fourth external supplier to the EU in 2004. It is particularly political circumstances that have hindered Libya from earlier becoming an exporter to the European market. Most EU gas demand is considered to continue to be covered by piped natural gas imports.

Figure 4.1: Map: Natural gas resources for the Eurasian market



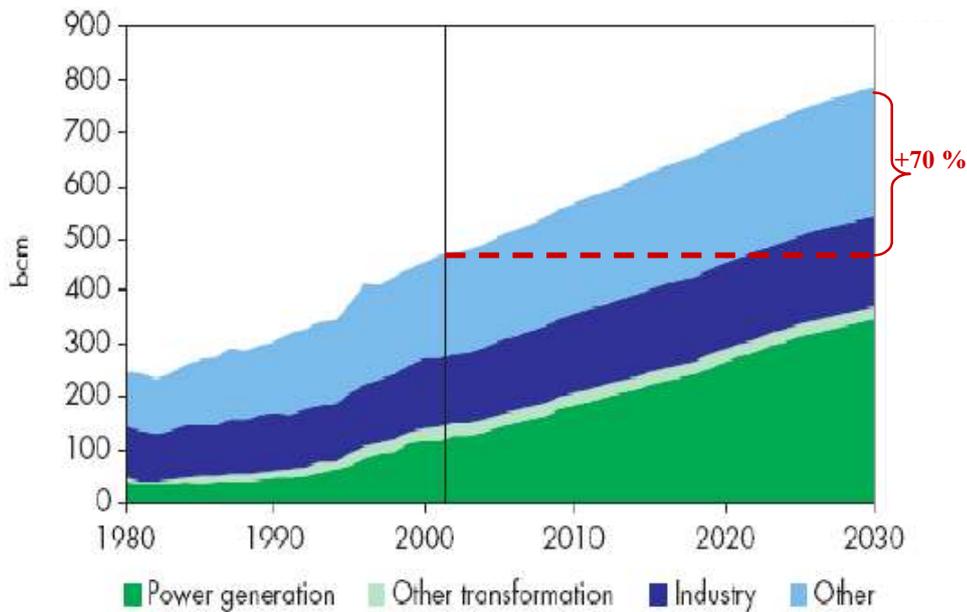
Even though domestically produced gas has been used in many European countries, ever since the nineteenth century, the European gas market is not considered to be more than about 40 years old. International trade with natural gas began when the Netherlands started exporting from the Groningen field in the 1960s, cf. map in Figure 4.4. The Soviet Union, Algeria and Norway followed in the 1970s. The infrastructure for production, transportation and storage has developed over the last decades in line with market growth. The European network for transmission of gas is today rather extensive, but it is only in recent years in a few geographical areas that there are competing pipeline corridors.

According to the IEA, total EU gas demand is expected to grow about 70 per cent towards 2030, cf. Figure 4.2.<sup>45</sup> In EU-15, as in the rest of the rich world, the growth is expected to take place particularly in gas power plants. In the new EU-

<sup>45</sup> Newer forecasts tend to expect somewhat lower growth in EU gas demand, albeit still high.

12 member countries, market growth is also expected to lead to increased consumption of gas in households and businesses.

Figure 4.2: EU-25 “business-as-usual” gas demand projections to 2030



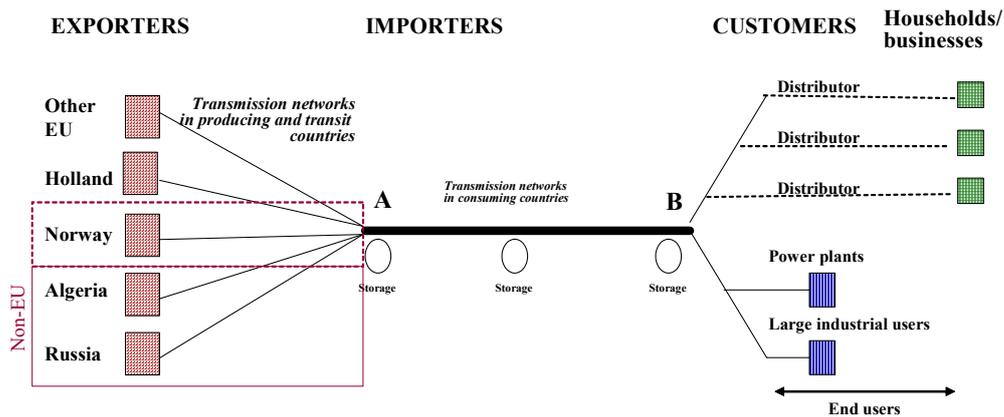
Source: IEA 2004

If such an enormous growth in demand for gas is to be met, new gas must come from areas like the Barents Sea, Siberia, Central Asia and / or the Middle East, in addition to the existing supplying areas, cf. Figure 5.2. An important question is whether these reserves can be developed in such a way that sufficient volumes can actually reach the market, based on long-term commercial criteria among producers.

In the way the European gas market has been working in its build-up period, gas has been sold and resold several times on its way from the drilling holes to the burner tips. Producing companies have sold gas on their borders to transmission companies, where also the “factory gates” for Norwegian gas were located. This is illustrated at point A of Figure 4.3. The transmission companies have been functioning both as long distance transporters and as wholesalers. The transmission companies sold the gas they bought to local distribution companies (LDCs), large industrial users and gas power plants at point B. While the industry

and the power plants use the gas themselves, the distribution companies, just like the transmission companies, also act as transporters and wholesalers. They sell gas to individual commercial and private users after having sent it through their local pipeline network.

Figure 4.3: The sale and resale of European gas



To secure the large and irreversible investments in production and transmission, close ties were developed between producing and transmission companies and between producer and consumer countries. This led to large long-term contracts between the parties. A typical “old” Norwegian gas contract may last for 20 years, while the contracts between transmission companies and their customers (LDCs, large industrial companies and gas power plants) are typically shorter, usually of 1-5 years’ duration.

Economies of scale and legislation often made transmission companies monopolists towards distribution companies, power plants and large industrial users. In addition, several transmission companies cooperated in periods over the purchase and import of natural gas (the “Grand Alliance” or Consortium, cf. Chapter 2.2-3), and by this strategy gained strong market power over the exporters, as monopsonists or oligopsonists at importing countries’ borders. At the same time, the sale of gas from producers was taking place in a few hands, through national

gas companies like in Russia (Gazprom)<sup>46</sup>, Algeria (Sonatrach) or the Netherlands (Gasunie), and the coordinated sale of gas from Norway (through GFU / Statoil). The export side may then be characterized as an oligopoly at the borders of exporting countries. In this way, the European gas market could in no way be characterized as "perfect" in liberal market terms. Prices and contractual terms were generally set through negotiations influenced by parties' market power and relations throughout the gas chain.

The concentrated market structure had its own natural explanations. The evolution of a natural gas market can be described as passing through three stages (Estrada, Bergesen, Moe and Sydnes 1988:3-6).<sup>47</sup> The first stage is characterized by a need for large investments both up and downstream, and reciprocal dependence on a stable demand and supply, in order to defend investments. If such an infantile energy resource is to penetrate energy markets quickly, prices must be set lower than alternatives (cf. Chapter 4.4), and potential buyers must be willing to adapt new technology and behavioral patterns. Once consumers are connected to natural gas, an interdependent relationship between producers and transmission companies is established with a long-term commitment to amortize investments.

The second stage is characterized by

*"an increasingly monopolistic power obtained by the transmission company in an expanding market" (ibid).*

As new consumers start using gas, the transmission company meets a more diversified demand, and is able to discriminate between customers. It can also meet more producers at its entry, further strengthening its position as a natural monopoly at both ends of the pipe. The interests of the producer, the transmission company and the customer become separate and clearer (Davies 1984:53-54).

In the third stage, transmission companies gradually take on more the role of transporter than merchant. The maturity of the market leads to some competition with alternative routes of transportation, and transmission companies' operations

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<sup>46</sup> Before the break-up Sojuzgasexport was responsible for Soviet gas exports.

<sup>47</sup> Estrada et. al. (1988:3-6) set up four stages, but we combine their stages number 2 and 3 into one.

may also be subject to government interventions and regulations. As natural gas becomes important in overall energy balances, it starts to compete with other energy sources more directly. At this stage the market integrates both horizontally and vertically, prices converge across market segments and energy carriers and links between actors across the gas chain becomes stronger. The monopolistic position of the transmission companies becomes less predominant, and market transactions more diversified. Producers and customers have to a certain degree a greater number of purchasers from which to choose (gas-to-gas competition). At the same time, however, as companies start integrating horizontally and vertically in the gas chain through mergers and acquisitions, a higher concentration around large champions may develop, if this is allowed by competition authorities.

The long-term contracts strongly contributed to the building of costly production and transport installations on the Norwegian shelf with reasonable economic security. This was supported by the TOP clauses in the contracts; if the buyers (transmission companies) were unable to sell their gas, they still had to pay for (a part of) the contracted volumes. However, this clause has to date (as far as is known) never been applied. Both transmission and distribution companies had profit margins associated with low risk. They were also assumed to collect high profits and be able to block transportation of gas to third parties. These aspects were important when the EU in the 1990s started to intervene into the functioning of the gas market.

For the political natural gas entrepreneur, its role changes with market maturity. The first stage requires long-term investments and commercial and political securing of long-term bindings between producers, transmission companies, customers and markets. If the state is not the entrepreneur, it would have to supplement a private enterprise with political guarantees for domestic investments, as well as in relation to other countries with respect to security-of-demand (cf. Chapter 5.3.1). Whether a private or political enterprise develops the sector upstream, long-term interdependent relationships will be established between respective selling and purchasing parties on both commercial and political levels. The interdependence created can at this stage largely be considered symmetrical between upstream and downstream actors. The establishing of long-term contracts of the field depletion type on the NCS in the

1970s (cf. Chapter 2.2), and the intra-industrial alliances (cf. Chapter 1.6) established between Norwegian sellers and downstream purchasers, were expressions of the infant status of both production areas and markets at the time.

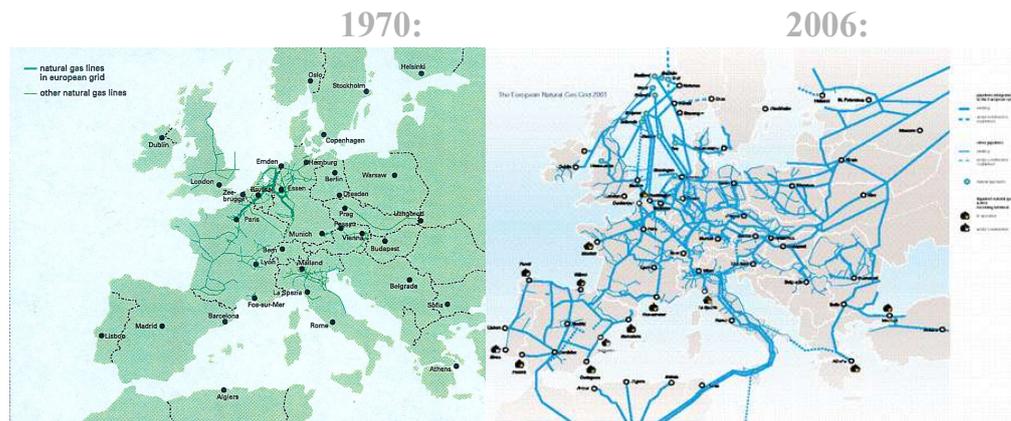
In the second stage the natural monopolies in the market obtain and exercise more market power, while competition increases in other segments. In this stage the interdependence between the TSOs on the one side, and producers and customers on the other, evolves in a rather asymmetrical manner. In both commercial and political terms producers will aim to counteract the market power of the TSOs, *inter alia* by concentrating gas sales as much as possible. The establishing of the GFU under the authority of the MPE, in order to take care of Norwegian gas sales in 1986 can be considered such a step, cf. Chapter 2.2. The subsequent establishment of the FU to arrange for supply contracts and secure scope economies across fields and infrastructural arrangements reinforced the role of governmental coordination of NCS gas activities, in a situation where these activities had become more diversified and comprehensive than in the first stage.

In the third stage, more competition in terms of alternative transportation routes and methods, and alternative energy sources, makes the market more flexible and integrated. As a result the monopolistic position of the TSOs is challenged. The need for long-term contracts becomes less predominant and the interdependence between up and downstream market actors more multilateral than in the first two stages. Public regulations of the TSOs to behave as cost-plus transporting companies become possible.

The exporter should in the third stage become more concerned with downstream market terms and prices, and political regulations and interventions, rather than primarily with relations to single purchasing companies and countries, as in the first two stages. He should also provide for arranging domestic natural gas activities in ways that make it possible to exploit the opportunities of a more open and flexible downstream market including smaller and more diversified contracts. The interest of exporters in maintaining a single seller is weakened, albeit by no means abolished, and it becomes important for natural gas exporters (also) to have more actors to undertake the more diversified

market operations. The total supply to the market and overall market structure becomes more important for prices and market terms than single contracts. The political entrepreneurship becomes more regulative than interventionist, and the need to be involved in every commercial deal becomes less important.

Figure 4.4: The European natural gas grid in 1970 and 2006



Source: Ruhrgas

EU natural gas markets have reached many elements of the third stage of market evolution over the past 20 years. It is reflected, inter alia, in a much more extensive transmission network as shown in Figure 4.4., and the EU has attempted to reinforce it through market liberalization, cf. Chapter 4.6. The merging of downstream companies impedes however the contestable character of the market, cf. Chapter 3.4 / 5.2. Norway's entrepreneurial reregulation of her natural gas activities in 2001-02 expresses how activities on the NCS have also largely reached the third stage. However, in some segments of up and downstream markets, where growth is strong and the infrastructure is not that comprehensive, markets can still be considered to be in their infant or youth (first or second) stages.

## 4.2 The boundaries between regulation and competition

Hence, market growth and infrastructural developments, as well as political decision-making, have gradually created a more competitive and liberal European natural gas market. To politically liberalize an international market for a non-renewable resource, which is by its nature non-competitive is however, not a

straightforward process. Competing national and international interests within and outside the EU, natural monopolies in transmission and distribution and the non-renewable nature of natural gas challenge the process, as discussed in more detail in Chapter 5. From a regulatory point of view, one issue involves considering an optimal design of a liberalized non-competitive market in general. Another issue is whether the liberalization of the European natural gas market should follow these market principles in a straightforward manner as they are, or if it should be given a different design reflecting market particularities.

In general, liberalization of non-competitive markets is to a large extent a question of the roles of, and relationships between businesses and the state. In the 19<sup>th</sup> century, liberalism was associated with a limited role for government and a high degree of sovereignty for individuals and businesses. In response to mercantilism, which dominated from the sixteenth to the late eighteenth century, liberalists emphasized that the individual's right to private property and the exchange of goods and services best served societies. Markets should be free and exploit gains from trade. During the period of industrialization, a liberal economic system contributed to significant economic growth, but also concentrated capital accumulation and increased the degree of social injustice. From the early twentieth century, orthodox (or classical) liberalism was not considered the correct means for attaining social goals or as a general system for organizing economic activities. This was particularly true for markets that are, by their nature non-competitive.

After WWII, in contrast to after WWI, an international economic and political system socially adjusted to a new economic world based on industrial production and trade took shape. The benefits of international economic exchange were to be exploited, but now governments were assigned explicit roles to regulate the system on national and international levels. In the Western world, organizations such as GATT on the global level and the EEC and EFTA on the European level organized international movements of goods and services, while the IMF became the global organization securing financial stability. Keynesian macroeconomics represented the domestic interventionist liberal approach in most industrialized countries. Governments were given roles to regulate industries, as opposed to the *laissez-faire*

policies of the 19<sup>th</sup> century, and in many cases they ran businesses themselves (nationalization).

Interventionist liberals tried to reconcile the values of individual freedom with social justice and a more egalitarian distribution of income. According to this policy, the government was to allow markets to work if they satisfied social goals. The *invisible hand* of the market is the best way of satisfying efficiency criteria and promoting economic growth. However, if markets are non-competitive, either by nature or cartelization, the *visible hand* of a public authority or regulator must often intervene in order to secure social goals, such as the provision of important goods and services, and to avoid excessive pricing practices, inferior service provision etc. (Hogan 1987).

Such a public authority can regulate the framework for and rules of operation for firms in the market, promoting competition and/or directly intervening in the behavior of single firms. Regulations of single firms should encourage (or force) them to provide an amount of a good or service, at a price that gives maximum profits and *simultaneously* satisfies social goals. If the results achieved, either by actual competition or by public regulations, bring about unacceptable injustice or inequality between persons, groups or regions, governments should intervene to correct this by redistributing income through taxes and subsidies, partnership schemes with the industry, and so on.

The particular aspect of markets that are by their nature non-competitive is that the goals of competition cannot be achieved only by the removal of barriers. If the most efficient operation of a market is relies upon one, or only a few, firms, these must be made to behave in a way that improves efficiency. In fact, an increase in the number of actors in such markets, per se, may increase costs, and, thus, represent a waste of resources, cf. Chapter 5.5.1.

For the functioning of natural gas markets, the most crucial elements are the cost of, and access, to transportation and to natural gas resources. Cost of gas transportation is characterized by strong elements of scale and scope economies, making transport firms natural monopolies in the markets in which they operate. This situation exists within other types of communication as well, such as roads, harbors, airports, railways, mail services, telecommunications and public transport,

with respect to water and electricity supplies, cable-TV, garbage collection etc. Often, when these type of firms provide an essential good for society at large, and they are known as public utilities.

In Europe, many public utilities operating as natural monopolies were nationalized in the aftermath of World War II. Under nationalization, the management of a single firm should take care of both private and social goals. However, these monopolies were gradually accused of being slow to upgrade technology, service and productivity. Being monopolists by nature (but sometimes only by law) they were considered bottlenecks in the development of each nation's competitiveness. Probably, the most frequently used argument explaining these firms' inefficient use of resources, has been the lack of competition.

Liberalization of such markets represents a departure from the "one management" approach, but it is not a return to laissez-faire policy. Usually, in today's market liberalization processes, state owned firms are privatized (but the government may also retain full or a significant share of control over ownership), operation of integrated services are separated ("unbundled"), competition is established when possible and regulation introduced when necessary (when competition does not work).

Thus, interventionist liberalism is a type of mixed economy concept, which most European countries have adhered to since World War II, rather than a rebirth of the nineteenth century's laissez-faire economics, cf. Chapter 1.7. However, as opposed to conventional social democratic economic models, new economic liberalism has strongly emphasized the benefits of competition as an instrument to reach social goals. Governments should in general not run businesses themselves, as seen in the build-up of the Norwegian petroleum industry. The goals themselves, however, need not be entirely changed, although they often should be modified, cf. Chapter 5.5.4.

Besides regulatory issues, successful natural gas market liberalization also depends on whether there is access to sufficient natural gas resources, and the costs of these resources. Being non-renewable and located mostly outside the EU, both resource economics and international affairs play a role in the success of the liberalization process within the EU. Sufficient amounts of natural gas will not be

automatically produced for the European market when prices goes up, unless the governments owning / controlling resources can and will allow for producing more. In most other markets prices provide a signal to change production patterns, while in the case of European natural gas only those few countries with relevant gas resources face this (over time nevertheless limited) choice. This is discussed in more detail in Chapter 5.4. Constraints for successful natural gas market liberalization are consequently economic, geological and environmental. At the same time they are not only a European and intra-EU concern, but must be understood from within an international political context, cf. Chapter 5.3.

This study argues that a fully and “perfectly” liberalized European natural gas market is unlikely to be achieved in the near future, if ever. Nevertheless, it is possible to analytically outline such an extreme market design as a point of departure for understanding the effects of market liberalization. Such an outline discussed in this chapter, will form the backdrop for discussions of various modified developmental trends in Chapter 5.

For the exporter, if no regulation or political intervention takes place in a third stage of a market development for natural gas, a need will arise for the establishment of a counter market force in those segments where the TSOs continue to occupy a dominant position. If the TSOs are *de facto* regulated to become TPA transporters at cost-plus schemes, such counter market forces will be of less importance. The more perfectly the market is liberalized the more important it will be to arrange for flexible natural gas sales. It may however be important to balance total supply into the total market, in order not to oversupply in weak market situations. To achieve this, collaboration with other suppliers is necessary, if possible. And as a consequence, common interests between exporters in different countries become clearer, and the competitive elements between them less predominant.

Imperfect markets provide the opportunity for a different form of political entrepreneurship than more perfect markets. The political entrepreneur in order to identify opportunities must be alert to shifts in prices, market situations and degrees and scope of changes in political regulations, interventions and institutions, as outlined in Chapter 1.1. This is an important reason for this

study's division of the discussion of impacts on the Norwegian state's natural gas entrepreneurship. Accordingly, the remainder of Chapter 4 focuses upon the case of largely full liberalization of the EU gas market, while important constraints to full market liberalization and the subsequent modifying impacts on entrepreneurship are discussed in Chapter 5.

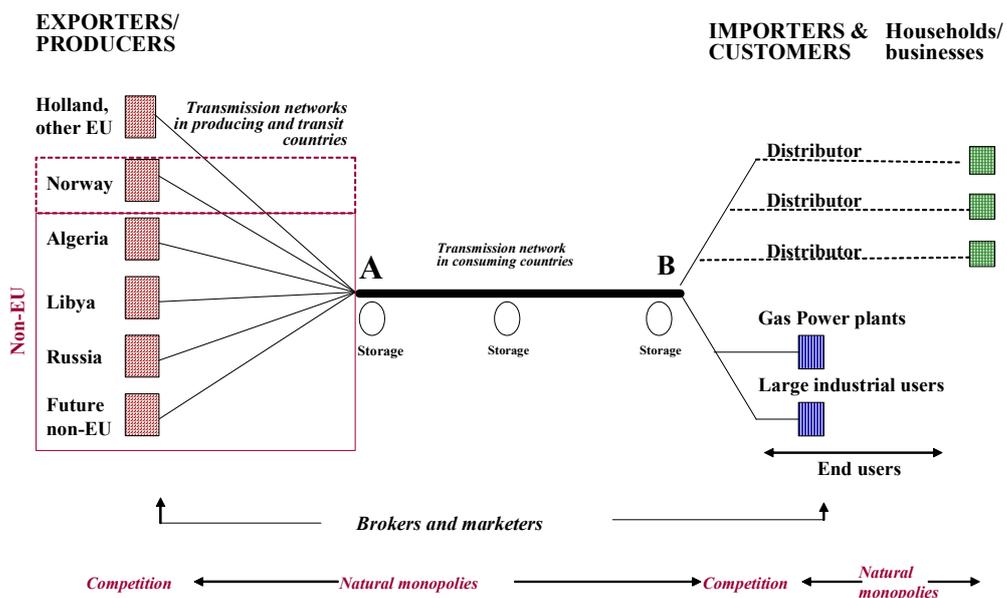
### 4.3 The design of a fully liberalized European gas market

We base the scenario of a perfectly liberalized European gas market on the following more specified conditions:

- a) Competition would be established wherever possible and public regulation of tariffs and prices carried out whenever necessary. TPA would be introduced on all transmission lines in Europe, and for storage capacity. Large end-users also receive TPA to the distribution network. The transmission companies divide transportation and storage from the sale of gas, by reorganization, accounting, or through unbundling. The sale of gas from transmission companies may still take place, but through separate marketing companies or sales units. LDCs serve households and small business customers at regulated prices and tariffs. The transmission companies are not obliged to supply local distribution companies, gas power plants or the industry. Such agreements made must be commercial, such that producers and marketing companies will offer this service against payment.
- b) All import and export monopolies are *de facto* abolished. Local distribution companies and large end-users gain the right to buy gas directly from producers or license holders. In Russia, Gazprom is privatized and split into more companies. Foreign companies gain access to Russian gas resources and the right to sell gas. Transportation companies operate the transmission network in Russia, as well as in other future supplying and transit nations, by the same principles as in the EU area. Investments in pipelines and the development of gas fields in all supplying nations are based on commercial principles.
- c) A regulatory authority at the *European* (and not only at the EU) level introduces rules for how to allocate limited transmission capacity. The agency

also regulates transport and storage tariffs. The principle for regulations is that tariffs are to cover long-run marginal costs for transportation companies and storage facilities. As long as there is free capacity in the transmission network, it is to be available for both firm and interruptible contracts, and made public. Short-term transportation needs must make way for long-term contracts, if demand for transport capacity is higher than what is actually available (other arrangements may also be considered, cf. Chapter 5.5.5). Transportation contracts may be transferable, so that an owner of transportation capacity may sell or lease it for shorter or longer periods. The regulating authority decides on the tariff structure, including depreciation periods, choice of discount rate, pricing of new transmission capacity, and other regulatory issues.

Figure 4.5: European gas trade in a liberalized market



In this market organization, the market power of transmission and distribution companies, as well as of producing countries, should be eliminated. Commercial buyers and sellers of gas will trade gas directly. They will use pipelines only as transporters, corresponding with a toll financed road system. The old structure, where an oligopoly of sellers at point A meets a monopsony of buyers in point B

as illustrated in Figure 4.3, is replaced by a structure where many sellers in each producing country meet many buyers at point B, cf. Figure 4.5. In the future natural gas must come from more non-EU member countries ("future non EU" exporters) in addition to existing sources and this will require TPA on their transmission networks. This description is close to an idealized version of what was described as the third (mature) stage in the evolution of a natural gas market, cf. Chapter 4.1, it politically fits the neo-functionalist view of EU (or here: European) developments, cf. Chapter 1.3, and it disregards the (potential) scarce nature of natural gas resources, cf. Chapter 5.4.

#### **4.4 Market liberalization and prices**

In this section we concentrate on the price effects of market liberalization. Some of the most usual principles included in European natural gas contracts are listed below (Davis 1984:47-48):

- Pricing/escalation provisions; ensure that prices of gas under contract evolve with normal economic development. Prices for the sale of natural gas in the European market are usually positively correlated to other energy prices contained in the contract, cf. later this chapter.
- Most-favored nation clause; ensures equitable treatment of parties to a given contract and parties to a similar contract in the same region.
- TOP clauses; ensures that the volume of gas offered under contract will be purchased, or that the seller will get an equivalent amount of cash.
- "Deliver-or-pay" (DOP) clauses; the same as "take or pay", except it is the buyer who benefits.
- Load factor clauses; ensure that a given load factor will be fulfilled by the parties to a contract.
- Renegotiation clauses; allows the parties to renegotiate due to changed circumstances that could not be foreseen when the contract was signed.
- Force Majeure; specifies conditions under which a party is not bound by contract.

This list illustrates that it is not only the price that is important for sellers and buyers of gas, but the entire package of provisions offered. Even if prices from different suppliers are the same, non-price provisions may present one seller with a better deal than another.

In Europe, price formulas have mostly been designed in a way such that prices react to changes in other energy prices with a time lag, reflecting the value of gas for end-users. The «value», or consumers' opportunity cost, represents a weighted average of their willingness to pay for gas. Each of these end-users face different alternatives, either it is district heating, fuel oil or coal. Natural gas has a market value, determined by its alternatives. In the short-run, most consumers have no alternative to the fuel they actually use. In the longer run, they can invest in equipment and production facilities that make them able to change, to or from gas. As a result demand becomes (much) more price elastic in the long- than in the short-run.

#### **4.4.1 Prices in “old” contracts**

The producer price, registered in the “old” market as the export price at the border to importing countries for the NGF, emerges as the difference between the above mentioned end user prices, taxes on the use of natural gas and gross margins of the downstream transportation companies. The contract negotiations between exporters and transmission companies determine how the export price varies in relation to end-user prices and which margins will end up with transmission companies. The producer takes the price risk in the market, as these prices were directly connected to the end user prices (“net-backing”). When the end user price of gas changed, then producer prices also changed according to a formula. Within a given (“old” and long-term) contract, the price to the producer may therefore vary, particularly with the prices of crude oil and excise taxes on fuel oils, in a predetermined way.

To illustrate these points, let us call the price between producers/exporters and purchasing transmission companies  $p_p$ , the price between transmission companies and the local distribution companies  $p_t$ , and the *net* price distribution companies

receive from their customers  $p_d$ . This is illustrated in the right bar of Figure 4.6.<sup>48</sup>  $p_d$  emerges as the price the consumer pays,  $p_c$ , minus taxes on the use of gas,  $t_{gas}$ . The gross margin left for the transmission and distribution companies,  $s_i$ , where  $i = t$  (ransmission share), and  $d$  (istribution share), becomes the difference between the price they sell gas for and the price they buy it for. The price of gas to the end user,  $p_c$ , must be shared between respectively producer ( $p_p$ ), gross shares to transmission ( $s_t = p_t - p_p$ ) and distribution companies ( $s_d = p_d - p_t$ ), and to end-user excise taxes ( $t_{gas} = p_c - p_d$ ).

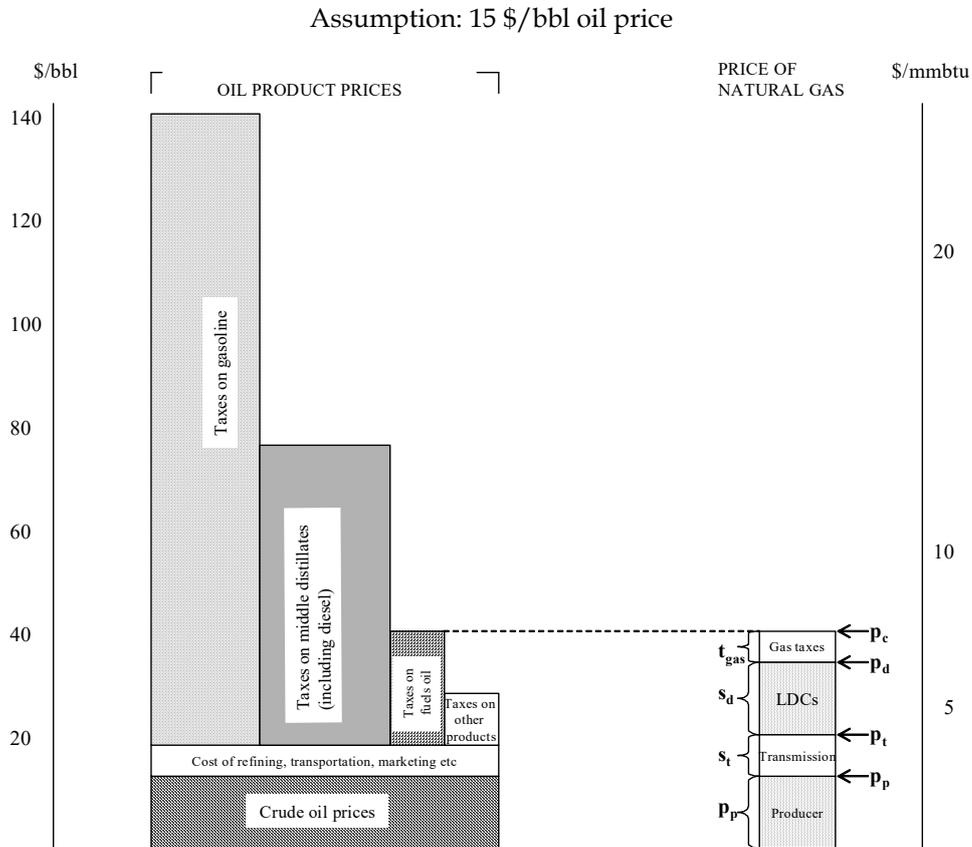
$$(i) p_c = p_p + s_t + s_d + t_{gas}$$

The price Norway as producer/exporter receives becomes consequently a function of consumers' willingness to pay in the individual markets. Individual consumers have different alternatives to gas. Norway's most important gas contracts have been tied to the end user prices of fuel oils, while some of other contracts have been tied to the price of coal or electricity.

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<sup>48</sup> In Figures 4.6-4.8, crude oil prices are set to only some 15 \$/bbl, this refers to the price level in large parts of the 1990s.

Figure 4.6: European natural gas and oil prices (simplified illustration)



If we simplify contracts to reflect only situations where gas competes with fuel oils, the link between oil prices and natural gas prices can be illustrated through the left set of bars showing end user prices for oil products. The price of crude oil, as well as the costs for refining, transportation, marketing etc. lies as a basis for these prices. The price of crude oil and these costs are illustrated in the figure as if they were equal across different types of crude oil, although this is not strictly accurate. The point however, is that the dominant difference between prices for the various types of oil products is the result of different levels of taxation.<sup>49</sup> Gasoline faces the

<sup>49</sup> With higher oil prices after 2001, gas taxes have also increased in monetary terms, even if they are of the *ad valorem* type (per cent of product price).

highest taxes whilst heavier products experience lower taxes (IEA quarterly, see also Chapter 4.7).<sup>50</sup>

The principle of pricing gas equal to the prices of the alternatives is used for prices both between exporters and transmission companies ( $p_p$ ) and between transmission and distribution companies ( $p_t$ ). A general pricing formula for gas in the European market can be formulated as follows:

$$(ii) \quad p_i = f_i\left(\sum_{j=1}^n \alpha_j * p_{ej}\right)$$

Here  $p_i = p_c, p_d, p_t, p_p$ . The factor  $\alpha_j$  expresses which weight energy carrier no.  $j$  is given in the price, while  $p_{ej}$  is the price on alternative energy carrier no.  $j$  ( $j=1 \dots n$ ). The function  $f_i$  expresses the link between the price of the alternatives and gas throughout the gas chain. Below is an example of a price formula concluded in the 1980s (between a transmission and a distribution network in Sweden).

$$(iii) \quad p_d = f(0.4 * p_{HFO} + 0.4 * p_{LFO} + 0.2 * p_{GO})$$

In this formula, the city-gate price (or price paid by distribution companies to the transmission network,  $p_d$ ) is a function of the price of heavy fuel oil ( $p_{HFO}$ ), the price of light fuel oil ( $p_{LFO}$ ) and the price of gas oil ( $p_{GO}$ ). The three oil product prices are given weights of 40, 40 and 20 percent, respectively, in the formula. Any increase in the price of one of these fuels, will also raise the price of gas.

Thus, the price of gas depends on the initial price levels of the energy carriers contained in the contract and the escalation mechanism in relation to these prices, or the form of the function,  $f$ . A change in the composition and weight of the alternative energies contained in the contract, will also affect gas prices. For example, if light fuel oils have a higher price than heavy fuel oils, and the contract is given a higher weight of light fuel oils, gas prices benefit.

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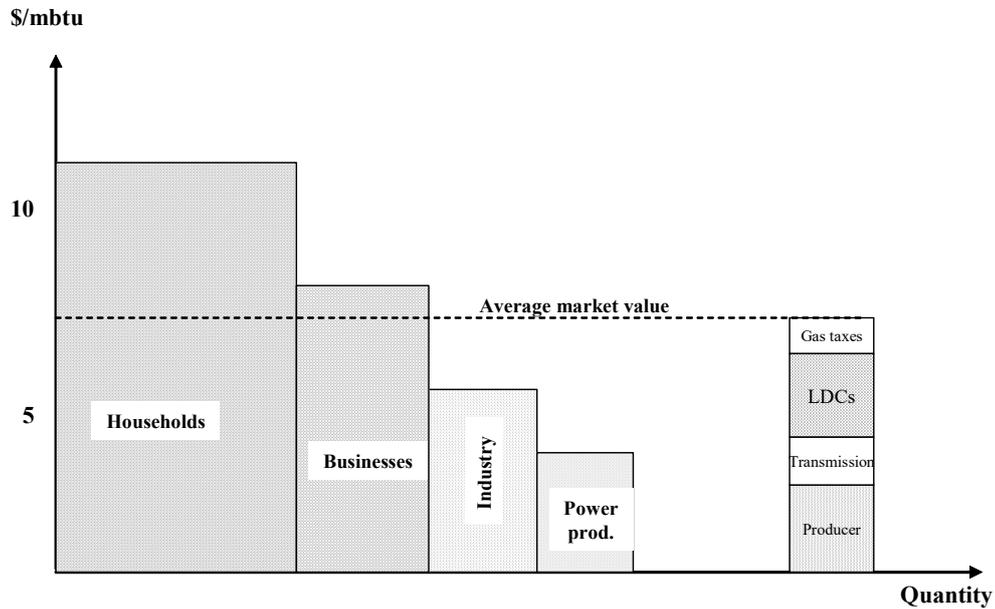
<sup>50</sup> For a "representative barrel of Brent crude", calculations in Austvik (1996) arrived at an excise tax on average of 46 USD/barrel and an end user price of about 70 USD/barrel (1994) in OECD-Europe. Reinch, Considine and MacKay (1994) arrived at about the same results. With higher crude oil prices after 2001 tax revenues have become higher as well as end user prices of oil products.

The initial starting point for prices in the various levels of the gas chain must necessarily be different, but the way the gas price varies with the price of the energy carriers which are included in the contract may be more similar. This means that the price of gas is influenced by:

- Which energy carriers are included in the formula ( $e_j$  energy carriers, each with the price  $p_{e_j}$ ).
- Weighting of the individual energy carrier ( $\alpha_j$ ).
- The initial relationship between the price of alternative energy carriers and the gas price.
- The escalation mechanisms between changes in prices for the alternative energy carriers and the gas price (the form of the function  $f$ ).

Contracts that concern the sale of gas to households may relate to other alternatives than for instance gas sold for the production of electricity. Generally, gas sold to households and commercial activities has received a higher price than gas sold to large industrial users which in turn were better paid than gas for electricity production, cf. Figure 4.7. Increased use of gas in a high price sector, like households, pressured the average market value upwards. Correspondingly a change of technology in a sector, like the one in power production over the last decades, increases their willingness to pay for gas. The price discrimination between markets have made it possible for producers to take part of the consumer surplus without disturbing consumption patterns, which would be the case if each group had to pay the same price.

Figure 4.7: The "market value principle" and price discrimination



The different prices that emerge cause average export prices per unit of Norwegian gas ( $p_p$ ) to become a function of the weighed average of the sale prices to the different sectors and countries. A change in the prices on the alternatives to gas, leads to a change in the price of gas to end users, and this happens to a large extent automatically. For example the Troll contracts contain however clauses to ensure that either buyer or seller can demand renegotiations every 3rd year if market conditions have changed so much that pricing formulas no longer reflect the competitive position of gas in the market.

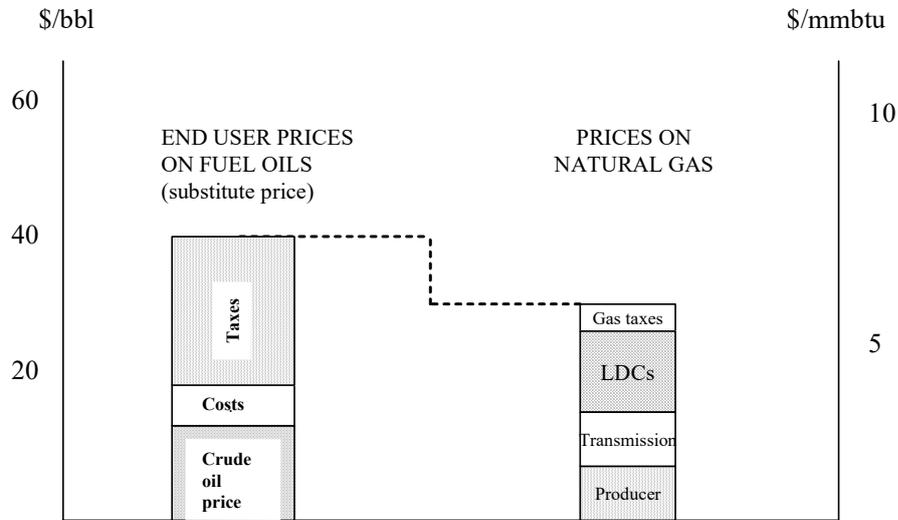
As long as margins to transportation segments,  $s_d$  and  $s_t$  are nearly constant after a contract is settled, the price for the producer/exporter,  $p_p$ , change due to changes in the competitive relationship to fuel oils, in the following ways:

- 1) A higher crude oil price. In our example, this will also raise the price of fuel oils to consumer and through that the end user prices on gas.
- 2) Higher taxes on fuel oil usage. In our example, this will give a higher price on fuel oils to consumer, and through that also a higher end user price on gas. Such taxes have helped keep up natural gas prices during the 1990s when crude oil prices were low, cf. Figure 4.13.

- 3) Higher taxes on all other oil products than fuel oils will, to the extent it pressures the price of crude oil downwards, tend to create lower end user prices on fuel oils and through that also lower prices for the gas producer (assuming that refineries, marketing stages, etc., do not increase their margins). However, this effect is assumed to be of less concern, and difficult to calculate as crude oil is a global commodity. If excise taxes are raised on all oil products at the same time, including fuel oils, it is uncertain whether any lower crude oil price which might follow, would be under or over compensated by a higher tax on fuel oils.

Based on these mechanisms and terms, the producer assumed the "price risk" while the transmission companies assumed the "volume risk" in a gas contract. As price and volume are two sides of market equilibrium, it will over time be the producer who assumed most of the risk. The transmission companies have however been tied by their TOP agreements with the producers. It might be imagined that the transmission companies are faced by sufficiently large off-take problems that they have to lower their prices to LDCs and other customers when entering into new sales contracts where the TOP clauses come into effect. This might lead to lower sales and/or declining prices for the transmission companies, i.e. a potential loss. As far as is known, this has yet to happen, but is a possible scenario in a liberalized market with over-supply, cf. the U.S. and UK. experiences discussed in Chapter 5.5.6.

Figure 4.8: Gas prices are set lower than substitute prices



Assumption: 15 \$/bbl crude oil price

Natural gas prices have been set somewhat lower than prices for substitutes, cf. Figure 4.8. This refers to the initial link between the price of gas and the price of the alter-native energy carriers in the discussion of formula (ii) above. This was done in order that the (large) volumes, which were agreed sold, would have the possibility of penetrating markets where gas competes with other energies. This implied that producers reduced prices relative to the pare value with the prices on substitutes. The degree of price decrease needed to offset larger volumes of gas in the market is however ambiguous. As discussed in Chapter 2.3, prices in the Statfjord contract of 1980 were set to approximately equal substitute prices, but were forced down in 1986 as part of the Troll contract package. The relationship between crude oil and regional natural gas prices for the period 1984-2007 are shown in Table 4.1, calculated in US dollars per million BTU.

Table 4.1: Natural gas and crude oil prices 1984-2007

US dollars per million Btu						
	LNG	Natural Gas				Crude Oil
	Japan	European	UK	US	Canada	OECD
	cif	Union cif	(Heren NBP Index) †	Henry Hub ‡	(Alberta) ‡	countries cif
1984	-	3,76	-	-	-	5,00
1985	5,23	3,83	-	-	-	4,75
1986	4,10	3,65	-	-	-	2,57
1987	3,35	2,59	-	-	-	3,09
1988	3,34	2,36	-	-	-	2,56
1989	3,28	2,09	-	1,70	-	3,01
1990	3,64	2,82	-	1,64	1,05	3,82
1991	3,99	3,18	-	1,49	0,89	3,33
1992	3,62	2,76	-	1,77	0,98	3,19
1993	3,52	2,53	-	2,12	1,69	2,82
1994	3,18	2,24	-	1,92	1,45	2,70
1995	3,46	2,37	-	1,69	0,89	2,96
1996	3,66	2,43	1,87	2,76	1,12	3,54
1997	3,91	2,65	1,96	2,53	1,36	3,29
1998	3,05	2,26	1,86	2,08	1,42	2,16
1999	3,14	1,80	1,58	2,27	2,00	2,98
2000	4,72	3,25	2,71	4,23	3,75	4,83
2001	4,64	4,15	3,17	4,07	3,61	4,08
2002	4,27	3,46	2,37	3,33	2,57	4,17
2003	4,77	4,40	3,33	5,63	4,83	4,89
2004	5,18	4,56	4,46	5,85	5,03	6,27
2005	6,05	5,95	7,38	8,79	7,25	8,74
2006	7,14	8,69	7,87	6,76	5,83	10,66
2007	7,73	8,93	6,01	6,95	6,17	11,95

† Price is for NBP Day-Ahead Index. Source: Heren Energy Ltd.

‡ Source: Natural Gas Week.

**Note:** cif = cost+insurance+freight (average prices).

Source: BP Statistical Review of World Energy 2008

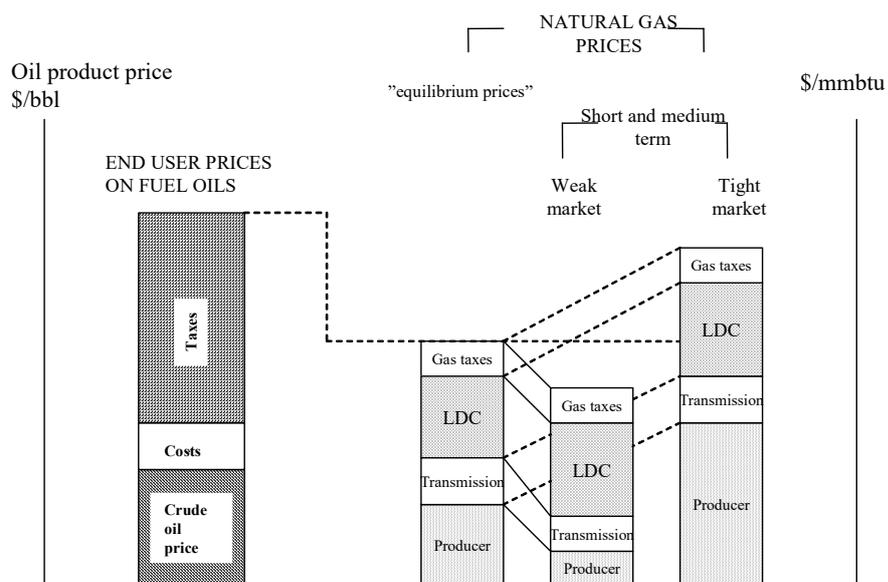
#### 4.4.2 Prices in a liberalized market

In a perfectly liberalized market, transport companies (transmission and distribution) would have their profit margins determined by a regulatory authority (or to some extent by competition), and operate in a cost-plus service. The wholesaler role of the transmission companies would be reduced and they would mainly function as transporters of gas against a tariff. In such a market, the margins for the transmission companies would be lower than today (ideally they should be regulated down to only include normal profit). Their gross

margins should be independent of price changes in end-user markets in a more direct way than in the “old” system, as they would no longer result from negotiations. The transmission companies may consequently in a fully liberalized market become increasingly concerned with influencing regulatory authorities who set the framework for their activities, as that would be their most important way to improving profit margins, rather than entering into negotiations with sellers, cf. Chapter 5.5.7.

In a liberalized market producers sell directly to distribution companies, power plants and large industrial users (gas-to-gas competition as opposed to gas-to-oil competition etc)). With end user prices determined by competing energy prices, *ceteris paribus*, lower margins to transportation companies would go to producers. A more liberal gas market will however, also lead to more short-term contracts including a spot market, cf. Chapter 4.5 Producer prices will react more directly to changes in end-user prices than before; and exporters will have to take over the contracts that have been handled by transmission companies as sellers of natural gas to the customers. This may lead to larger variations in gas prices in the short and medium term (which could be several years), depending on how tight are markets. In periods it may yield both higher and lower prices than the price of alternatives.

Figure 4.9: Increased price volatility due to liberalization



As producers now depend more directly on what takes place on the customer level, their prices might fall if the market is weak (supply surplus). This is illustrated by the middle of the three gas bars in Figure 4.9.<sup>51</sup> A tight market situation might on the other hand, lead to prices higher than substitute prices (demand surplus). This is illustrated in the third gas bar. As a consequence, the distribution of benefits from market liberalization depends on how tight is the market, the scope of restructuring throughout the gas chain and how exporters, transporters and customers behave. Also, incumbent players in the market will gain from increased competition in other parts of the gas chain, but usually not from increased competition within their own segment.

In perfectly functioning liberalized markets, the economic profit (the resource rent for producers and the monopoly rent for transporters in the case of natural gas) should in principle disappear over time at all levels. EU's assumption (EU 1998, 2003a) is that the users of gas will be the ones to reap the benefits of liberalization through lower prices, as in most other markets being liberalized.

The assumption that the economic profit will disappear in such a market may be correct for the *transmission and distribution companies*, if it is assumed that the lack of competition is replaced by an *efficient* regulatory regime. They have had, and will in a liberalized system have, relatively stable margins. Margins will however be lower. If there are several competing transmission systems, they may in addition face increased uncertainty about what volumes to transport. Their income may vary more than before, and this will further aggravate their position.

The transmission companies therefore, have every reason to oppose the implementation of any liberalization of the market. However, when regulation is seen as impossible to avoid, they will seek to "trap" the regulator in such a way that they actually retain as much of the profit as possible (a "principal - agent" situation). Their strategy will then include elements of both conflict and cooperation with the authority (-ies) and forces in the market which push

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<sup>51</sup> If the effect is strong enough this can happen even if gross margins for transmission and distribution are reduced.

liberalization processes forward, cf. the game presented between Norway and the EU in Chapter 3.3.

The *customers'* possibilities of buying gas from several sellers/producers will improve in a liberalized market. It will mainly be their bargaining position in relation to producers that will determine the degree to which they may obtain cheaper gas than before. On the basis of the larger number of sellers they should be facing, it is likely that their bargaining position will be strengthened compared to the monopoly (represented by the transmission companies), with which they were negotiating before. *Ceteris paribus*, this means that prices may become lower for customers after liberalization. Depending on how supply develops, buyers may however still end up with prices resembling or even higher than those that existed before liberalization. This is determined by the total balance between natural gas supply and demand, and is thus directly linked to the prices offered to producers. In the long-run, substitute prices continue to determine gas prices at the customer level.

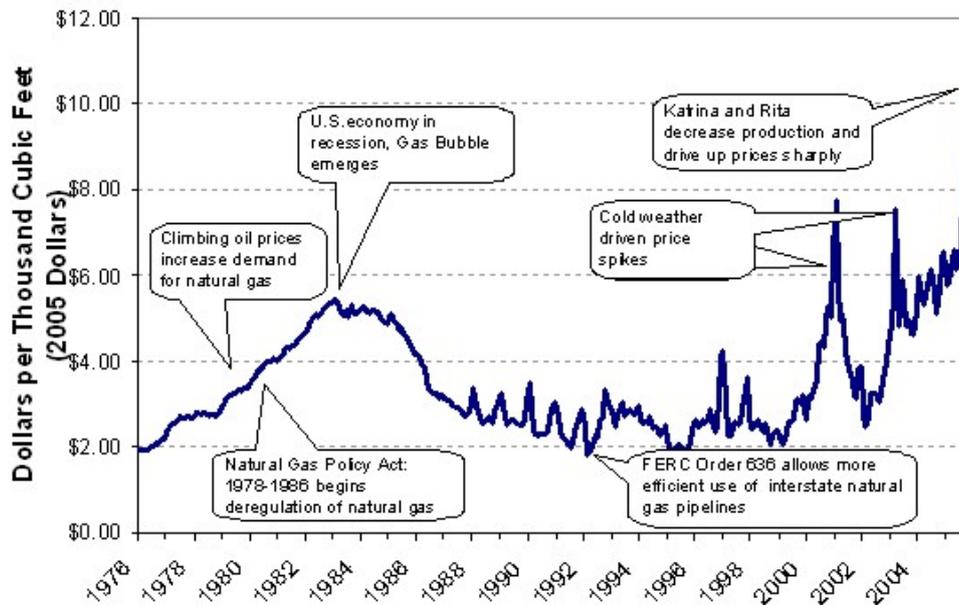
As for the customers, market development and competing sources of energy will contribute to determining the price *producers* will get in the market. At the same time, the introduction of TPA and the elimination of the transmission companies as counterparts may strengthen the bargaining position of producers. The lower margins in transportation may end up with the producer, as well as the customer. The establishment of gas-to-gas competition at the customer level (point B in Figure 4.5), tends to reduce prices to producers in the short and medium term. If there is free competition between all small and large producers of gas, each of them will sell gas as long as it is profitable. Production decisions made on commercial criteria by individual producers lead each firm to increase production and sales up to short-run marginal costs (SRMC), which may be very low, and increase total supply of gas, cf. Chapter 5.4. It may lead to an increased total supply of gas with a following drop in prices.

At the same time, lower prices and a more flexible supply will lead to a quicker rise in demand, which will consume the surplus supply faster than if the prices did not drop. Lower and more unstable producer prices also lead to fewer investments in new production capacity. In the long-run producer and customer

prices should as a consequence increase when production capacity is absorbed in a liberalized market.

These assumptions parallel experiences from the U.S. that liberalized (or “deregulated”) her gas market in the mid-1980s, cf. Chapter 5.5.6.1. Lower oil prices, gas-to-gas competition and excess supply in the market led to a drop in gas prices in the second half of the 1980s, cf. Figure 4.10. Weak energy markets and free access to transmission in both inter and intra-state trade, led to an increase in the number of short-term agreements and spot contracts. They gradually replaced many of the long-term contracts. The desire of producers and costumers to sell and buy gas was reflected in the Open Access (OA - similar to the term TPA in Europe, cf. Footnote 54 for definitions of terms) market faster than before, and the division between the transportation and the broker function became more clear-cut. Gas could be bought from entirely new producers in new areas. Available capacity in, and OA to transmission, combined with large quantities of gas being offered, made short-term and spot contracts dominant in the market.

Figure 4.10: U.S. annual average well-head gas prices 1976-2005



Source: California 2006, Appendix 1

With market deregulation new players also emerged. Marketers started to buy gas for re-sale, and brokers began to arrange trade between parties, cf. Figure 4.5. A market for futures contracts was established in 1990. The marketers began to compete with the transmission companies' broker function when the pipeline network capacity became accessible. In 1991 contract carriage<sup>52</sup> reached 82 percent of the total market. The Federal Energy Regulatory Authority's (FERC's)

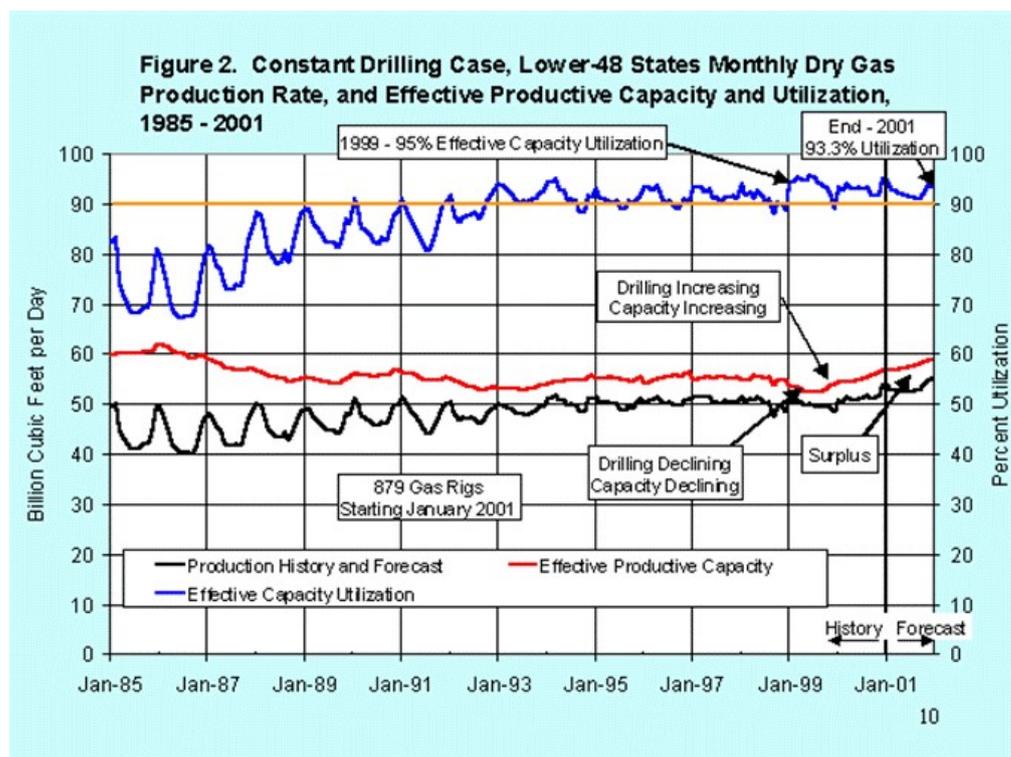
<sup>52</sup> *Private Carriage* is transportation where the pipeline buys the gas from the producer for resale to local distribution companies, power plants or large industrial users. This is how the European gas market has been working in its first stages, and to a large extent is still working.

*Contract Carriage*, on the other hand, is transport of gas owned by others. This is how the European market to a larger extent should work in the future.

Order 636 in 1992 was intended to further future competition by requiring that independent companies should separately arrange transportation and storage.

The gas “bubble” evolving gradually disappeared in the 1990s due to lower prices caused by the OA market and lower energy prices in general. Production capacity did not increase while demand increased. Almost no new production capacity emerged during the 1990s, cf. Figure 4.11. Eventually the market became tight; prices rose and started to react sharply to temporary changes in demand and supply. Prices became very volatile and reacted sharply to increased demand due to cold weather in 2002, and supply reductions in the wake of hurricanes in the Mexican gulf in 2005.

Figure 4.11:U.S. natural gas production capacity 1985-2001



Source: EIA 2001

The British natural gas market, started its liberalization processes around the time the Sleipner deal was rejected in the mid-1980s (cf. Chapter 2.3), and shared similar experiences, cf. Chapter 5.5.6.2. Together with U.S. market deregulation,

U.K. market liberalization was a direct forerunner for EU gas market liberalization. During a decade the British gas market changed from being dominated by BG as an integrated monopoly with no competition and without the structure necessary to change it, to an industry that moved quickly towards full competition. BG's market share was reduced from 100 % in 1985 to 35 % in 1997 when she ceased to exist as one large company. However, also the U.K. gas market became eventually tight, and after a

*“grace period with lower prices, UK gas consumers had to endure dramatic increases from 2003, being undercut by the much less liberal continental European marketplace (Wright 2006).*

In 2006, however, prices in the U.K. again undercut European prices, cf. Table 4.1. While short- and long-term effects of liberalization of this type of markets may differ considerably, there are also more factors than time that influence prices. We will return to some of these aspects in Chapter 5.

#### **4.5 Effects on contractual forms and modulation**

The second main set of effects from market liberalization to be discussed is the developments of spot markets and other markets for short-term contracts. The magnitude of short-term trade that evolves depends on market conditions, as prices also do. In a market characterized by excess supply, spot trading can be expected to account for a larger part of total gas trade. In a tight market, customers can be expected to be more cautious about buying gas in the short-term. As a rule, spot sale depends on free capacity in the transmission system and whether or not gas storage has been filled to such an extent that short-term demand can be met. Such short-term demand may be dealt with by a wholesaler or it might be handled under separate contracts. Gas purchasers may in principle in a liberalized system buy directly from producer or license holders in a field, but this is unlikely for smaller buyers. Market centers (“hubs”) will grow up in places like Zeebrügge or Emden, where several buyers and sellers meet through pipelines and/or LNG-terminals.

There is a potential for increased demand for gas when supply of short-term gas is made more flexible. Purchasers who have only made long-term contracts

(because they had to) will sign up for short-term contracts for some of the available volume. New purchasers may emerge. The spot market may therefore become larger than merely through the additional demand created by a more dynamic supply. Put simply, the greater the possibilities for spot sales, the larger the market.

In the wake of a spot market, new ways of adapting to and reducing risk will also emerge. This holds for tools of a financial character, like instruments for a futures market and/or an options market, as we see within the trade of crude oil and currencies.

*“Once there is sufficient liquidity, spot markets for immediate and forward delivery emerge. In places with a liquid forward market, futures markets evolve to hedge exposure to price volatility. Price volatility modifies the role played by traditional flexible tools, such as storage, which is increasingly used to maximize profits rather than simply to manage volume” (Cornot-Gandolphe 2002).*

The complexity of these transactions leads to a need for brokers and sales companies, cf. Figure 4.5, knowledge about up-and-downstream markets which smaller customers do not possess themselves and knowledge about special niche markets. In addition to the statistical publication of prices, costs, etc., brokers may contribute to increased market transparency. Changes taking place in one part of the gas chain may affect all parties much faster than before.

Increased price volatility and contractual diversification due to liberalization requires greater dynamics in producer decision-making processes. A larger number of contracts with more diverse customer types and sizes will emerge. More smaller and short-term contracts and *expectations* for the long-term market development may become a barometer for how long long-term contracts will actually have to be, as we have seen for periods of time in the oil market. It will be significant for producers if they organize production, transportation and sales operations to exploit these changes. This is one reason why the GFU in its old form was gradually seen to be partly inadequate, when it comes to the new situation faced by Norwegian gas sellers before the pressure came from the EU to bring about its dissolution, cf. Chapter 3.2.

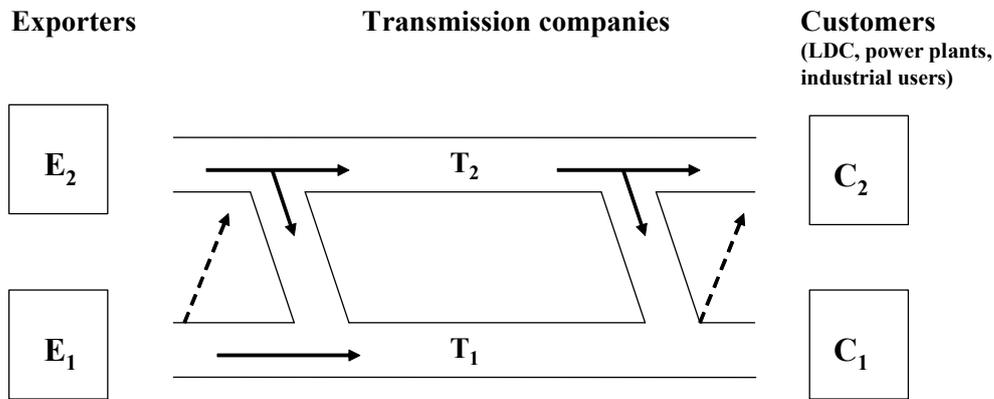
Long-term and large contracts were a precondition for the large investments in North Sea gas fields, as well as for the development of Siberian and Algerian gas. The long-term contracts "assured" a market and a price for the gas according to specific guidelines. A liberalized market system threatens this stability. In a weak market this could lead transmission companies to requiring renegotiations, cancellation of existing TOP-agreements. Competition, perhaps regulation of their tariffs, will reduce their profit margins at the same time as market pressure may lead to lower prices on the gas they sell at the end of the pipeline, thereby making them unable to meet existing contracts with the producers.

In the U.S., due to the oversupply in the market (the "gas-bubble") and lower energy prices, many pipelines suffered from TOP contracts with producers after deregulation in the 1980s, cf. Chapter 5.5.6.1. This led the U.S. to determine that the TOP policy was inadequate and let OA pipelines share 50 percent of their take-or-pay costs with their customers. Also in the U.K., more short-term agreements between producers and buyers were developed and the spot market began to have an affect upon long-term prices. The long-term TOP contracts encountered serious losses and financial problems to shippers and producers when gas prices dropped in 1995 (Stern 1998).

TOP problems may arise because of liberalization and also because of an expanding infrastructure and alternatives routes of transportation in maturing markets. The important variables are market balances and price levels. Assume a weak market and increased competition among transmission companies (another route of transportation is made available). In Figure 4.12 exporter  $E_1$  sells gas to transmission company  $T_1$  in a long-term contract for 20 years.  $T_1$  resells the gas to customer  $C_1$  in a more short-term contract that for practical purposes is renewed every 1-5 years. Then a new pipeline  $T_2$  is built, and a competing transmission company is established. If a new exporter  $E_2$ , now signs a new contract with customer  $C_1$ , who was previously tied to a contract with  $E_1$  via  $T_1$ , through the new pipeline  $T_2$ , then  $T_1$  loses a volume and will have to cover costs through a lower transported quantity. If the transmission company operates with falling average costs (economies of scale), the lower volume will lead to costs per transported unit increasing. If exporter  $E_2$  transports gas through  $T_1$  and replaces an out-phased

contract held by  $E_1$ , only transaction costs should on the other hand, have significance for  $T_1$ .

Figure 4.12: When a new pipeline is built



Even if the new seller  $E_2$  makes a contract with a new customer,  $C_2$ , who is not already buying gas and transports this gas via the new transmission company  $T_2$ , the profits of  $T_1$  are affected. In order to become the best transportation alternative,  $T_2$  will have to lower its transport tariffs (or gross margins) relative to  $T_1$ , something that will be advantageous for exporter  $E_2$  and buyer  $C_2$ . The new competitive situation puts a pressure on  $T_1$  to lower its tariffs, as more contracts will otherwise be placed via  $T_2$ . At the same time, it will become more difficult for  $T_1$  to sell gas through his more short-term contracts based on terms for old gas, as the prices to the customer will be pushed downwards.

The new situation with more suppliers on the customers level will create incentives for the customers to renegotiate existing contracts with transmission companies, and in any case sign new contracts on better terms when the old runs out. As these contracts are shorter than the long-term TOP contracts (20 years) with the producers, the transmission company may be left with large volumes of gas it is unable to resell at conditions defined in the contracts with producers.

With a sufficiently high market growth,  $T_2$  will be able to calculate when a new project is profitable on a sufficiently long planning horizon and challenge the existing monopoly  $T_1$ . A decrease in tariffs leads, *ceteris paribus*, to lower prices to

customers and higher prices to producers, and increased supply and trade of gas. If demand growth is strong enough,  $T_2$  will also gradually be filled to capacity. If demand growth is not large enough however,  $T_2$  will be able to compete with  $T_1$ , so that  $T_1$  will be forced to demand renegotiations of its TOP clauses with its producers. If  $E_1$  continues to sell gas through  $T_1$  to  $C_1$ , and prices to  $E_1$  drop, the producer will have to accept all the disadvantages in the new market structure, but not the advantages of lower transmission costs through  $T_2$ . This will pressure  $E_1$  to also transport gas through  $T_2$  and sell gas under new (and better) terms to both  $C_1$  and  $C_2$ .

If these processes continue for a long enough period of time, exporters may also come to the point where they require long-term contracts to be dissolved, as they no longer reflect prices they could have obtained in the market with lower transportation tariffs through  $T_2$ . Whether either the transmission company or the producer require cancellations of existing contracts will depend on market conditions, as well as on financial strength, expectations of future developments and legal bindings.

Thus, in a liberalized natural gas market, both buyers and sellers may desire new long-term agreements in addition to more short-term sales. There may be long periods however where buyers desire shorter agreements than sellers and vice versa. In periods with low prices, purchasers will hope to enter into short-term contracts. If they think prices will increase, they will desire to close long-term contracts at the low prices. Sellers may during periods of high prices hope for further price increases and desire short-term contracts. If they think prices will decline, they will try to land long-term contracts with the higher prices. With a spot market for gas, customers will experience alternatives for long long-term contracts. A customer who exclusively bases himself on long-term contracts may not capitalize on low gas prices in the spot market. Consequently, when new large contracts are agreed directly between producers and customers, they may be of a less long-term character than in the old system.

It is not obvious how tariff structures will be affected when a monopoly is replaced by an oligopoly of transmission companies. Neither  $T_1$  nor  $T_2$  will have an interest in reducing each other's tariffs too much through competition, and a game

between the two will most likely be initiated. At some point in time  $T_1$  will profit from adopting a different strategy: from being opposed to a changed market situation to participating and influencing it, cf. the discussion provided in Chapter 3.3.4. If regulation is introduced,  $T_1$  and  $T_2$  will begin to work towards making sure that the acts of the authorities/regulators will serve their interests. Cooperation (or merging) would however be the best for both  $T_1$  and  $T_2$ . A competition authority will have as its obvious task, ensuring that they do not start such collaboration.<sup>53</sup>

The effects on existing TOP contracts of market openings and the construction of new transportation capacity does not have to be as dramatic, as outlined above. In a situation with gradual development of transportation capacity and several TPA contracts, renegotiations of prices may take place as agreed. Gradually the alternative of selling gas directly to customers will be built into the pricing formula, and thus gradually reduce margins to transmission networks to the advantage of producers and/or customers. In the EU, the part of the gas directives that state how fast and how much the market should be opened can be considered an expression of this attempt to adjust to a new situation, cf. Chapter 4.6.

Before liberalization, transmission companies balanced out geographical and sectorial differences in customer demand. These differences will appear more directly to the producer in a liberalized market. The larger the producer and the more it is possible to take over the wholesaler function of a transmission system, the more likely a comprehensive contract portfolio may become large enough to balance out fluctuations in individual markets against an more even total contract portfolio. However, it is important to remember that transmission companies not only buy and sell gas, but also market it. Unless the producer develops a marketing organization that can assume parts of the wholesaler function of the transmission companies, the possibility for long-term contracting in a liberalized market is weakened. Following this, it is necessary for the exporter to integrate downstream in a liberalized market.

In the context of EU gas market liberalization, the generally tight energy markets seen after 2001 and high end-user prices cover for the underlying

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<sup>53</sup> Examples of recent company concentration in downstream markets are however with the E.ON – Ruhrgas and Gaz de France – Suez mergers, cf. Chapter 3.4 / 5.2.

pressure on established TOP contracts. This contrasts with the situation in the U.S. and U.K. which deregulated/liberalized their natural gas markets when they were weak with low and partly falling prices, cf. Chapter 5.5.6. With the present tight energy and natural gas markets and high prices, EU transmission companies face no problems when it comes to fulfilling TOP obligations stated in “old” contracts, even if they compete with new actors and direct downstream sales. *Ceteris paribus*, the interests of the producers in this situation should be to sell all new gas directly to customers in mature markets. In mature markets producers may integrate as much downstream as possible and establish a foreseeable and stable portfolio of contracts directly with customers to offset their volumes, and replace the purchasing role of the transmission companies. The problem for producers is however apparent in immature parts of the market (in their first or second stages), where significant costs must be sunk to develop production and transportation. In such cases long-term contracts are necessary and TOP clauses attractive.

#### **4.5.1 Impacts from increased price volatility and contractual diversification on the political entrepreneur**

More short-term contracts and more volatile and independently determined prices on natural gas make it important for the exporter to arrange for flexible natural gas sales, in order to exploit new opportunities while simultaneously maintaining market power in segments where TSOs or others are dominant. To avoid oversupply and maintain a tight balance between total supply and demand in the market it will be important how the combined supply from all exporters to the market add up. Common interests between different exporting countries become clearer and the competitive elements between them less predominant, while at the same time exporters and importers share interests in price stability. The situation provides for more multilateral actions on both supply and demand sides to have an impact on market outcome, more so than in the “old” system.

When imperfections occur, due to market imbalances or unsuccessful, or the absence of, relevant political regulations and interventions, the political entrepreneur should be alert to the identification and exploitation of opportunities in more interventionist ways. In some cases this might comprise

mainly commercial actions; in other cases the need for involvement on political levels both in relation to the EU, but first and foremost bilaterally with purchasing member states and/or other exporting nations. The maneuvering room may in some cases become larger; in other situations it can become smaller. And the situations are not static, with one type of action possible at one point in time, while another is possible at other times.

#### 4.6 EU efforts to liberalize her natural gas markets

The desire to make the EU natural gas market more open and flexible was put on the political agenda in the 1980s. The Single Act from 1986 and the establishment of the Single Market from 1993 assumed free movement of labor, capital, goods and services. Obviously, as the European gas market did not satisfy the basic criteria for a common market, the EU Commission stated in 1988 that (EU 1988a; 57ff):

*"National or regional monopolies or virtual monopolies dominate the natural gas transmission and distribution industry in Europe. Primarily for economic and technical reasons (internal) gas producers hold a monopoly over transmission, distribution and, in some cases, imports."*

More specifically, it described the role and position of the transmission companies:

*"Gas transmission undertakings buy gas from producers under long-term (20-25 years) contracts, transmit it and resell it in large quantities to industrial users, power stations and public distributors. Each of these Member States apart from Germany has just one transmission undertaking. Some of them are public-sector undertakings, others are privately owned and the rest are a mixture of the two. The public distribution and transmission undertakings are granted exclusive operating concessions by the national, regional or local authorities."*

The document also addressed constraints on the free movement of natural gas within the Community:

*"The biggest barriers to the free movement of gas in Europe are government controls on natural gas imports and exports and undertakings holding a monopoly or dominant position enabling them to block movements of natural gas."*

The document highlighted the international aspect and the non-competitive structure of the industry, but not the location and non-renewable character of natural gas resources. The document did however expand on the problem of transportation:

*“Transport of gas in the Member States is characterized by the existence of statutory or de facto monopolies in the marketplace. Only in West Germany there are a number of actors but even here there is one dominant transport enterprise. In the UK, a new legal instrument has been introduced in the form of the Common Carriers provisions of the 1986 Gas Act, which require pipeline owners to carry for third parties under certain conditions but as yet no use has been made of these provisions. In the Federal Republic of Germany, there is no legal mechanism outside of competition rules, for the dominant transporters to carry gas for third parties. Italy has, however, provisions that come close to this. In Trentino-Alto Adige and Sicily, legislation provides that, where the transport concessionaire is not the licensee of the gas field itself, the licensee of the field has the right to make use of the pipeline within the limits of available capacity. ... The presence of dominant or monopoly transmission undertakings in each Member State gives rise to segmentation of the Community market; these undertakings can restrict the through transport of gas and even where no specific legislation exists, can block the import and export of gas.”*

From these observations, the document suggested the following priorities to promote the efficiency of the gas grid:

*“Decomartmentalization of the natural gas markets; common carriage.*

- a. The exclusive transmission concessions must be checked to see how to facilitate the free movement of natural gas whilst maintaining a high level of security of supply and economic transmission condition. Transmission or distribution undertakings could be allowed direct access to the resources in question.*
- b. The prospect of extending direct access to resources to large industrial customers should be considered in the light of the results obtained in connection with point c. (the suggested priorities in the natural gas sector).*

*The above two points both hold out the possibility of giving third parties access to the grid as against payment of a reasonable charge (the "common carrier system").”*

The Commission expressed the expectation that a Common Carrier (CC) system would influence the demand for natural gas in Europe.<sup>54</sup> With the amortization of the transportation infrastructure, gas transportation costs would be reduced and a more flexible approach to natural gas trading would thereby be encouraged. Producers with identified fields for development were to be matched with customers willing to increase their use of gas at competitive prices. The CC system was to ensure open access for anyone who wished to use it. The transmission companies were to collect a "reasonable" tariff covering their expenses and normal profit, but not any economic profit (profit beyond normal profit).

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<sup>54</sup> Different terms have been used to characterize the overall idea of making or mimicking competition in natural gas markets. They have partly been connected with specific understandings of a market liberalization process. Among the most important ones are:

*Common Carriage (CC)* has been associated with the way excess demand for transportation in relation to pipeline capacity, should be allocated. If demand exceeds capacity, the burden should be shared by all shippers according to their nominated volumes on a pro rata basis. In order to give access to new customers, initial volumes could not be used as an allocation device. Therefore, pro rata reductions mean that everybody reduces by the same percentage their throughput according to contracted volumes. One problem with a pro rata arrangement is that it can lead to gaming between shippers in determining the size of nominated quantities ("over-booking"). Another problem is that it challenges the security of supply for existing customers and contractors. The term originates from the U.S. who has used this system. The European Commission ultimately rejected the system (EU 1991b).

*Third Party Access (TPA)* is a more loosely defined concept than common carriage. It defines how gas should not (only) be transported between two parties (usually the producer and the merchant pipeline), but (also) for a third party (usually the customer at the end of the pipeline). It states that pipelines should carry gas for others in return for payment. The allocation of excess demand, as well as a number of other techno-economic regulatory issues, are not defined.

*Deregulation* is a word with its origins in the U.S. The U.S. gas market was regulated at all levels up to 1978. When the market was liberalized, a deregulation took place, in particular among producers. However, pipelines were actually reregulated, and the market structure as such changed into a mixture of deregulation, meaning competition, and reregulation, meaning new terms for operating natural monopolies. For many, the word deregulation has remained the more appropriate term for characterizing the entire process.

*Open Access (OA)* is also a term used in the United States, in a quite similar way as the Commission uses the TPA term. There has been some discussion over possible differences between OA and TPA, but this is not important in our context (Stern 1992:25-26).

The word *liberalization*, used in this study, could mean the same as the concept of TPA or OA. The important point is that it involves a process that makes the market work more competitively, by increasing competition or by introducing force or incentives in a regulatory process, in order to reach social goals in a more optimal manner than before. The choice of word is made in order to avoid misunderstandings among those having specific understanding and interpretations of the other concepts. IEA (1994) introduced the term "*Mandatory Open Access*" (MOA) for the liberalization process and the reasons were much of the same.

The CC system was however abandoned already in 1991. Instead, the EU proposed three directives in order to:

- a. Make the market more transparent (EU 1990),
- b. Allow the transit of gas between high pressure transmission pipelines (EU 1991a), and
- c. Introduce TPA to the transmission pipelines as well as splitting ("unbundling") the transmission companies' function as both transporters and wholesalers (EU 1992).

The first two proposals were approved. The TPA directive was however postponed, following strong resistance from the European gas industry and the European parliament. It was not until December 1997 that the TPA directive (the first gas directive) was approved for implementation in August 2000. The directive's intention was to

*"establish common rules for access to the market and for the criteria and procedures to be used when licensing the transmission, storage, and distribution of natural gas" (EU 1998).*

The directive entailed that EU countries over a 10 year period would have to open up for more direct contracts between producers and customers. 20 percent of the market should be accessible immediately, 28 percent after 5 years and 33 percent after 10 years. All gas power plants could use the arrangement, as well as industrial users above a certain size. In the initial phase, industrial users who could avail themselves of the system had to have a consumption of at least 25 million cubic meters per year, at least 15 after 5 years and at least 10 million cubic meters after 10 years.

The greatest difficulty in agreeing on the directive was the stipulation of the minimum shares of each market, which were to be opened in the three phases of the plan. The debate about this lasted almost one year after the forerunning electricity directive (EU 1997a) had been approved. France and Belgium wanted to limit the liberalization to include a minimum level of 15 percent of the markets. Their intention was assumed to be the protection the interests of Gaz de France and Distrigaz who both had nearly 100 percent control over import and

transportation in their respective countries. On the other hand, the UK and Germany wanted at least 28 percent opening during the first phase of the plan. These countries put forward arguments about the advantages of faster liberalization. Under the directive, an allowance was made for national authorities (if they permitted it) to have new take-or-pay-contracts. A number of rules were established for how the Commission might overrule national regulations.

The directive should create easier and more reasonable access to the main corridors for natural gas transportation for producers and customers. To a larger extent than before, they should be able to make direct contracts and have the right to negotiate for transport agreements with the transmission networks. A TPA arrangement should ideally lead the pipeline companies to operate only as transporters. The directive did however not set a procedure for how to solve disagreements, e.g. about which tariff should be applied if negotiations were not successful. Distribution companies were not affected by the directive unless decided by the national authorities. Moreover, the directive did not regulate competition between producers. The first directive stated that producers and buyers of natural gas were to make direct contracts between each other and possess the right to negotiate a transportation agreement with a transmission company. It was a step towards a more liberal European gas market. However, it would not create a complete and perfectly liberalized market, as outlined in Chapter 4.3.

Already in March 2001 the EU signaled the need to speed up the process (EU 2001a). The second gas directive (EU 2003a) provided deadlines for the full opening of the market – 1 July 2004 for all business customers and 1 July 2007 for households. Equally it demarcated the independence of transport system operators from other activities (production and supply), through legal and operational unbundling of these activities. This key legislation also contained a number of obligations for national regulators. They were to monitor the development of competition, levels of investment and, where appropriate, the level of prices. The intention was to create more transparency and give operators more ability to predict their evolution.

The second gas directive represented a step towards the speeding up of the liberalization processes and the focus on the role and regulation of the transmission systems became sharper. National regulators were to play a central role in ensuring the efficient operation of the market.

*“The Commission is increasingly giving national energy regulators the responsibility for monitoring and promoting the development of the market” (EU 2004a).*

In “An Energy Policy for Europe” plan (EU 2007a) the EU opened for the possibility of a regulator on the EU (federal) level. This formed the base for a third gas directive. While the first directive concentrated on the introduction of TPA and the unbundling of services; and the second directive was concerned with legal unbundling and national regulations; the third directive proposed (EU 2007c) focus *inter alia* on ownership unbundling and the introduction of a regulator at the EU level. The two first directives can in this context be understood as the start-up of a process that will take a long time, with more directives and political interventions to come, beyond that is, a possible approval of the third directive.

While the gas directives addressed challenges concerning transportation of, and intra-EU trade in, gas, they did not address issues concerning access to non-EU supplies, transit issues or how the expected substantial increases in demand was to be met with higher production. To a large extent the directives were concerned with downstream market efficiency, and only Norway among external suppliers was affected domestically / upstream. The attitudes embedded in the directives reflected what was written and debated in a period of relatively low energy prices, and when concerns over the possibility of tight energy markets and security-of-supply problems were almost absent, cf. Chapter 5.3-4. Energy policy was for many synonymous with competition policy.

After 2004 oil prices returned to the high levels of the early 1980s and in 2007 even passed historic real price level in modern history. The EU began to discuss more closely policy that also included challenges from the non-renewable nature of foreign gas, import dependency issues and environmental problems following the continued emphasis on carbon fuels in the energy mix (EU 2007a), cf. Chapter

5.1. From a neo-functionalist perspective this suggested the start of a development towards a more comprehensive and potentially more common EU energy policy. Alternatively, an inter-governmental perspective would argue that the situation might lead to stronger national policies addressing individual countries' energy situations, as possibly seen in the German-Russian joint venture Nord-Stream project. These issues will be closer examined in Chapter 5.2.

Taken together, more competition in terms of alternative transportation routes and methods, and alternative energy sources, have made the market more flexible and integrated. Regulation of the TSOs to behave only as transporting companies should add to this flexibility. As the role of the political natural gas entrepreneur changes with market maturity and the arrival of the third stage of market development, he should evolve into an exporter gradually more concerned with downstream market terms and prices, and political regulations and interventions, rather than with only relations to single purchasing companies and countries, as in the first two stages. These can to a greater extent be dealt with by commercial actors alone. The need for long-term contracts becomes less predominant and the interdependence between up- and downstream market actors more multilateral. More short-term contracts and more volatile and independently determined prices on natural gas make it important to arrange for flexible natural gas sales to exploit new opportunities, while simultaneously maintaining market power in segments where TSOs or others occupy dominant positions. To avoid oversupply and to maintain a tight balance between total supply and demand in the market, it will be important how the combined supply from all exporters to the market add up. The imperfections in EU regulations underline how the market situation is better described as a mixture of the three stages discussed in Chapter 4.1, rather than as fully liberalized, as outlined in Chapter 4.3.

#### **4.7 Taxation of natural gas usage**

Parallel to market liberalization efforts, the EU has been working on the harmonization of taxation of energy products including natural gas usage, to replace taxes on labor and income (EU 1997b, 2003d). Minimum levels for taxation on gas usage were set across the Community. Since gas (and oil) prices have been

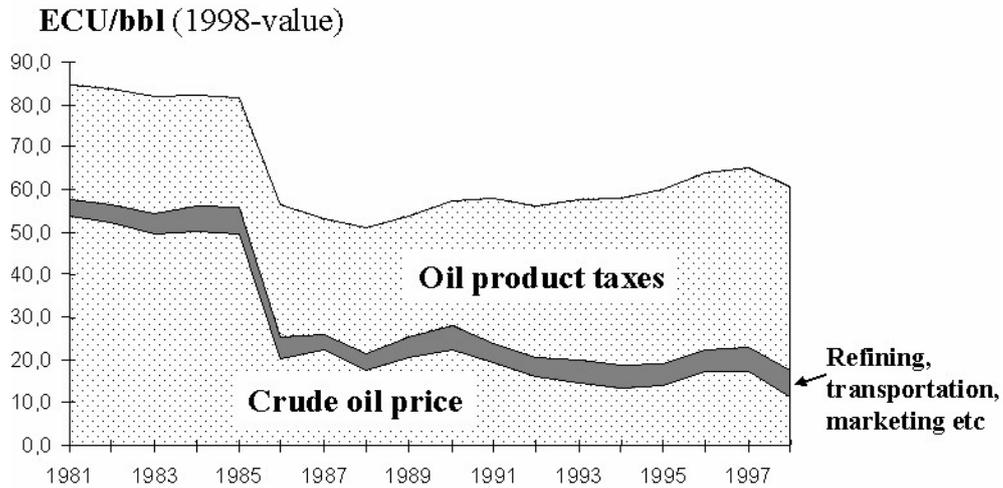
very high after the directive was approved, most increases in taxation of energy have to date been effectively halted. An increase in gas excise taxes on consumers may however, become particularly attractive for consuming countries' governments when rent is made available in the gas chain, during a liberalization process or when prices drop for some other reason. This has already happened in the oil market. When crude oil prices dropped in 1986 and 1991, consumers could have derived the benefit from the loss of rent among producers through lower prices. However, and particularly in Europe, consuming countries raised oil product taxation, which stabilized end-user prices and to some extent suppressed demand and (delayed?) a potential later price rise on crude oil (Reinsch, Considine and MacKay 1994, Austvik 1996).

In the 1970s and up to the drop in oil prices in 1985/86, crude oil producers received 75-85 percent of end-user prices on oil products (gasoline, diesel, fuel oils, etc). The prices were far above production costs, and gave huge revenues to producing countries. The remaining share went to refining, marketing and to the treasuries of consumer countries. After the drop in oil prices in 1986, the situation was more or less reversed. Until prices again rose after 2001, crude oil producers received a much smaller share of end-user prices in OECD countries. The share that consumer taxes take varies between Europe, USA and Japan - on average it accounted for half of end-user prices. EU countries have the highest taxes, which accounted for as much as 70 percent of end-user prices before oil prices once again rose. Consumers within the EU paid 70-80 \$/barrel for a representative barrel of Brent oil in the 1990s (taxes included), when crude oil prices ranged between 15 and 20 \$/barrel, cf. Figure 4.13 With higher oil prices after 2001, taxes have gone up because many are of the *ad valorem* type, even though producers' shares have also increased.<sup>55</sup>

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<sup>55</sup> The numbers should have been updated, but for the purpose of the argument in this text I have not considered it worth the considerable workload it would imply.

Figure 4.13: Oil prices for producers and consumers. OECD  
Europe



Source: Austvik 1996 with updated data until 1998

Taxes on oil products have however affected Norwegian gas prices positively and made them more stable than crude oil prices. This is because gas prices have been largely linked to end-user prices of oil products, including taxes, cf. Chapter 4.4. The divergent development of crude oil and natural gas export prices reflects a far more moderate tax level on natural gas than on oil. An increase in fuel oil taxes will as an example, on the basis of our assumptions, push end user prices up without transmission and distribution deriving any benefit from it while producer prices rise, cf. Figure 4.6.

However, gas usage taxes are gradually also on the increase. As share of end user prices to households taxes represented 20-50 per cent in 2006 and 1999, around 20 percent in 1994 versus 15 percent in 1984, cf. Table 4.2. Taxes on gas for electricity production and to the industry are lower and in many countries zero, even though they have also gradually increased. Even though natural gas usage is taxed at a lower rate than oil, taxes on polluting coal have been even lower in many European countries. Germany has for instance no tax on coal (actually they subsidize the production of coal). The impression is that energy taxation in consumer countries is not primarily based on environmental considerations, but

rather on fiscal needs and a degree of inelasticity of demand (so-called Ramsey taxes, after Ramsey 1927).

Table 4.2: Gas taxes as a percent of end-user prices in OECD countries

Country	Gas to households				Gas to industry				Gas to power production			
	1984	1994	1999	2006	1984	1994	1999	2006	1984	1994	1999	2006
Austria	16.7	16.7	27.7	27.8	0.0	n.a.	n.a.	n.a.	0.0	1.5	n.a.	n.a.
Belgium	14.5	20.9	21.3	n.a.	0.0	n.a.	n.a.	n.a.	0.0	0.0	n.a.	n.a.
Czechia	n.a.	4.8	18.0	16.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Denmark	18.0	20.0	58.1	49.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Finland	1.7	28.0	31.8	25.1	n.a.	12.1	15.8	10.1	1.7	12.1	16.8	n.a.
France	15.7	15.7	15.9	15.0	0.0	n.a.	8.1	3.4	0.0	0.0	n.a.	n.a.
Germany	12.3	19.0	23.7	n.a.	n.a.	17.7	16.0	n.a.	0.0	14.0	18.6	n.a.
Great Britain	0.0	5.7	4.8	4.8	0.0	n.a.	n.a.	n.a.	0.0	0.0	n.a.	n.a.
Hungary	n.a.	9.1	10.7	14.3	n.a.	n.a.	n.a.	2.5	n.a.	n.a.	n.a.	n.a.
Italy	13.4	42.6	46.5	n.a.	0.0	n.a.	n.a.	n.a.	0.0	10.7	11.6	n.a.
Neth.lands	16.0	19.1	35.0	32.9	0.1	7.8	9.1	n.a.	0.0	7.5	8.5	n.a.
Spain	1.5	14.3	15.1	13.8	1.5	n.a.	n.a.	n.a.	1.5	n.a.	n.a.	n.a.
USA <sup>1</sup>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Canada	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Japan	0.6	2.9	4.8	n.a.	0.0	n.a.	4.8 <sup>1</sup>	n.a.	0.9	2.9	n.a.	n.a.
New Zealand	8.1	15.0	13.8	12.7	n.a.	n.a.	n.a.	n.a.	11.3	6.4	5.0	n.a.

Source: IEA Energy Prices and Taxes. n.a.: not available. 1) Taxes on gas vary between 3 and 6 percent of end user prices in USA (IEA).

What would be the effect of harmonized increases in gas usage excise taxes across the EU? A first anticipated effect might be higher consumer prices. If consumers pay for the tax through higher prices, growth in demand will gradually be reduced. If growth is to be maintained, prices to consumers may not be increased. Instead prices in one or more stages in the gas chain ( $p_d$ ,  $p_t$  and/or  $p_p$ , cf. Figure 4.6), must be reduced to pay for the tax.

As far as known, such taxes are not explicitly taken into account in “old” gas contracts. It would also probably be difficult to bind formally parliaments of purchasing countries not to change their tax policy in the future. How renegotiations between respectively distribution, transmission and producing

companies about an increase in taxation of gas usage will end up, depends on the negotiating strength between the parties, legal obligations etc. The margins ( $s_t$  and  $s_d$ ) of the transportation companies are largely determined by negotiations that are unaffected by changes in end user prices. As long as transmission companies can argue that these margins are necessary to cover their costs, an increase in gas taxes will not hurt them at first. If prices to end-users are to compete in the same way as before with substitute prices, an increase in gas taxes must cause a corresponding decline in producer prices. As experience shows, increases in taxes are eventually passed on to producers / exporters.<sup>56</sup>

Figure 4.14: Price effects of an increase in excise taxes on gas consumption

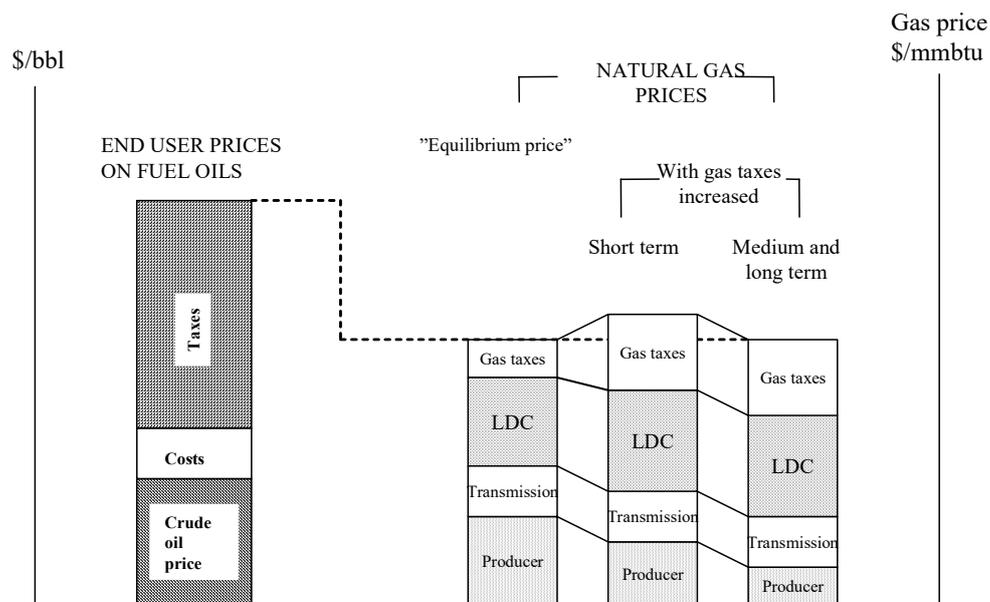


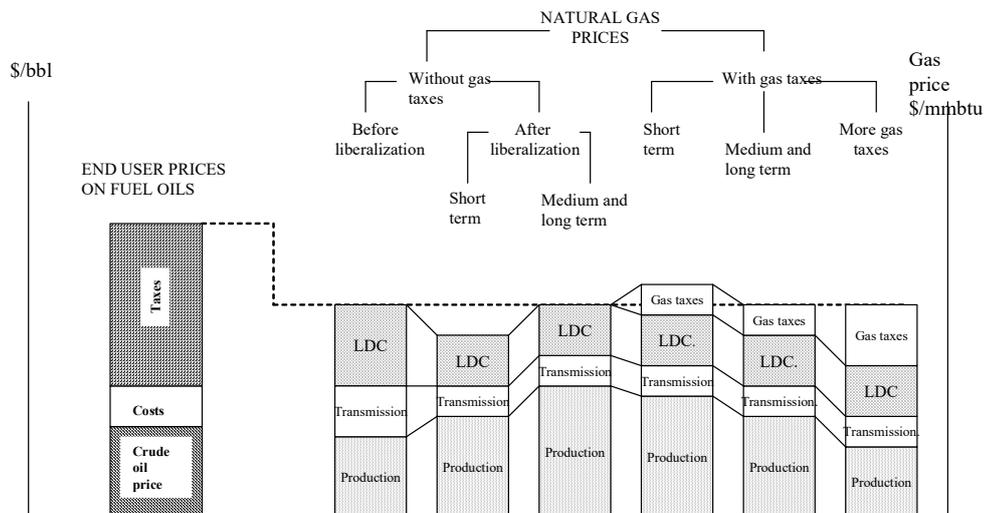
Figure 4.14 shows end-user prices on gas in the first of the three right bars, again with direct indexing to end user prices on fuel oils (left bar). An increase in taxes on natural gas usage may in the "short" term lead to higher consumer prices, as well

<sup>56</sup> ECON (1995:6) maintained that "In Continental Europe, import contracts specifically foresee that increased gas taxes compared to oil taxes shall be deducted from import prices..". Such a contractual relationship between taxes and producer prices is not however documented/confirmed.

as putting pressure on producer prices, while the margins of transmission and distribution remain unchanged (middle of the three right gas bars). If growth in consumption is to be maintained all taxes must however, be eventually passed on to the producer (third of the three right gas bars). Even though this may be the result over time, all parties throughout the gas chain have every reason to object to increases in gas consumption taxes, as long as *to any extent* they also put the profit margins of the transmission and distribution companies under pressure.

In Figure 4.15 the increased instability in and market reactions of prices due to the liberalization process discussed earlier in this chapter is abstracted away. *Ceteris paribus*, increased competition between transmission companies or regulation of transport tariffs should, when successful, lead to lower transportation costs. The profits taken from these companies will generally be redistributed to customers and producers of gas. Hence, lower margins to transporters can in the short-term simultaneously lead to lower prices for customers and consumers, and higher prices for producers. The situation is illustrated by gas bar no. 2. Lower consumer prices will lead to increased demand. If growth in demand is to be maintained, the price to the end user must also be maintained, and most of the economic profit removed from the transporters may be passed on to the producers/exporters (gas bar no. 3).

Figure 4.15: Price effects of liberalization and increased excise taxes



To give the benefits from lower transportation costs within the EU as excess rent to external producers, makes a politically initiated liberalization process unattractive from consumer countries' point of view. To prevent such a redistribution of economic rent consuming countries may increase gas consumption taxes and capture for their own treasuries the released economic rent from the transporters. The effects of such an increase in taxes are shown in Figure 4.14, and transferred to Figure 4.15 by gas bars no. 4 (short-term) and no. 5 (long-term). Dependent on the reaction among producers/exporters taxes on natural gas may be theoretically increased to the point where consumer countries do not give any economic rent to the marginal producer at all (as assumed illustrated by gas bar no. 6)

The theory of exhaustible resources tells us that when resources become increasingly scarce, consumer prices must become increasingly higher. In Chapter 5.4 (cf. Figure 5.8) we will discuss the claim that prices *must* necessarily raise in the future as a too extreme and partial use of the model. Increased consumer taxes add to the list of reasons why producer prices may fall over time, and this is even if consumer prices rise. An active *and* coordinated consuming countries' taxation policy that continuously increases energy taxes, may lead to a situation where eventually no rent is left to producers. Marginal user cost could (in theory) become zero. Thus, if excise taxes on end-users are continuously raised, producers' price path may follow a downward trend, while consumer prices increase (Austvik 1997).

Figure 4.16 illustrates the situation of an initially competitive market with prices at  $p_0$  (no monopoly profit to producers).<sup>57</sup> Prices are expected to increase along the price path  $H_0$  up to the backstop price, cf. Figure 5.5. However, at time  $T^*$  consuming countries *simultaneously* introduce an excise tax,  $t$ , on end-users. With this tax consumer prices shift to  $p_1$  and producer prices drop to  $p_2$ . If the tax remains at  $t$ , consumer prices should rise over time at a slower rate than before the tax, in the same way as the monopolist's price path, cf. Figure 5.7. Such a price path is illustrated by  $H_1$  while the price path for producers is illustrated by  $H_2$ . The distance between  $H_1$  and  $H_2$  equals the constant tax,  $t$ . The shift from  $H_0$  to  $H_1$  represents the

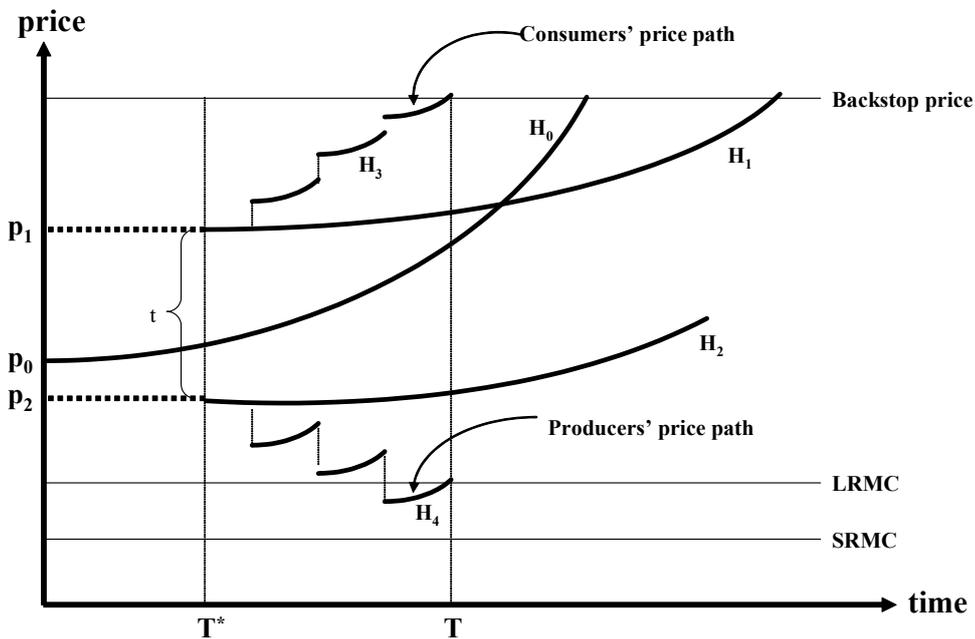
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<sup>57</sup> The economic theory of exhaustible resources is presented in greater detail in Chapter 5.4.

same type of effect on consumers as a monopolization of the supply side. The difference is only that consuming countries' treasuries take the rent instead of producers.

If consuming countries raise taxes over time, consumers' price path will shift upwards until prices reach the backstop price. This is illustrated as the discrete price path  $H_3$ . While consumer prices make the shift upwards, producer prices shifts downwards, as illustrated in the discrete path  $H_4$ . Both LRMC and SRMC curves are drawn. If producers' prices are pushed below LRMC following  $H_4$ , they will continue producing at existing capacity, but no new investments will be made. This will be the case for prices all the way down to SRMC. If prices are pushed down only to LRMC, new investments will be made, but no rent will be collected by producers.

Figure 4.16: Consumption taxes; diverging producer and consumer prices

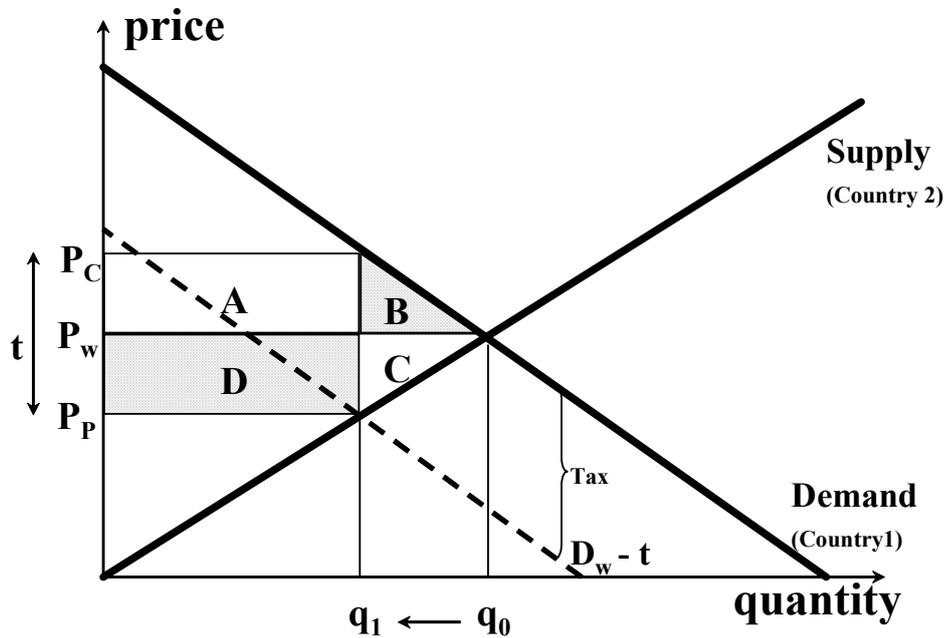


Tax policies on oil and gas become of particular political interest with respect to the distribution of economic rent because the principal part of production takes place in other countries than where the consumption takes place. In Figure 4.17, this point is

illustrated by a generalized and simplified situation where it is assumed that all production takes place in different countries than consumption. The equilibrium price in the international market is given by the world market price  $P_w$ . A tax,  $t$ , is levied on consumers in importing countries. The consumers' willingness to pay remains the same (represented by the demand curve), but through a consumption tax the treasuries of consumer countries are able to take a share ( $t/p$ ) of the price which consumers pay, illustrated by the dotted curve ( $D_w - t$ ). Consumer price is then pressured upwards to  $P_C$ , while the price to producers is pressured downwards to  $P_P$ , and the amount traded drops from  $q_0$  to  $q_1$ .

Areas (A+B) reduce consumer surplus. Area A is a transfer of surplus from consumers to the treasuries of consumer countries. Area B is net welfare loss due to reduced consumption at the higher prices. The excise tax revenue consists of area  $A+D = t * q_1$ . Area D denotes a transfer of revenue from *foreign* producers to the treasuries of the *consumer countries*. Area C is a further loss for foreign producers due to the lower prices and reduced production. As there is assumed no production in consumer countries, area C does not represent a loss for them. It will in sum be advantageous for consumer countries to introduce or increase a tax on consumption if area D is larger than area B, i.e. when the share of tax revenue from the foreign producers is larger than the welfare loss of the consumer countries, due to reduced consumption.

Figure 4.17: International distribution of gas consumption taxes



Change in:	World:	Importing country:	Exporting country:
Consumer surplus:	- (A+B)	- (A+B)	0
Producer surplus:	- (C+D)	0	- (C+D)
Tax revenues :	+ (A+D)	+ (A+D)	0
Net social surplus:	- (B+C) < 0	- B + D > 0 if D > B	- (C+D) < 0

The size of areas D and B depend on elasticity of supply and demand in both absolute and relative terms (Pindyck and Rubinfeld 2005:326-329). If either demand and/or supply are rather inelastic, there will be little distortion of consumption whether it is the consumer or the producer who pay the bulk of the tax. However, income distributional effects may be significant. Whether it is producers or consumers that eventually pay the tax depends on which of them is the least price sensitive, or most inelastic. It will always be the one with the relatively most inelastic supply/demand that pays most of an excise tax. With a relatively less elastic supply side, the producers pay more than half the tax. With a relatively less elastic demand side, the consumers pay more than half the tax. It is only in the cases where *both* demand and supply are elastic, that volumes are substantially changed as a consequence of a tax increase.

It is important to note that when a tax is levied on all supply or demand, *the effects on prices and volumes traded in the market are the same* (ibid.). The effects are the same if consuming countries tax consumers or producer countries tax producers, but the effects on who receives the revenues differ significantly.<sup>58</sup> It is also important to note the necessity of collective action in raising taxes. A single country may not be large enough to have any impact on the prices of producers. In such cases, the tax will all be paid by domestic consumers.

As countries with open trade need rules on minimum levels for taxation and cost-driving regulations to avoid a “race-to-the-bottom” development; the EU sets minimum rules for energy taxation and in a number of other fields. This is one important reason for the pressure towards the harmonization of energy taxation. For a large importing country, or a group of countries such as the EU, taxes may however pressure prices for exporting countries in a downward direction. In fact, taxes may be orchestrated across borders in a way that maximizes the social surplus in purchasing countries. This is similar to the way in which an optimal tariff works for large importing countries; as expressed in international trade theory (Austvik 2002:174-176).

When taxes are introduced in a market, consumers will in general lose, irrespective of whether it is the producing or consuming country that levies the tax. The exception is the special nil-effect cases when demand is completely elastic or supply is completely inelastic. Producers will also experience losses, except in the special nil-effect cases, where demand is completely inelastic or supply completely elastic. Thus, both customers and producing companies have every reason to oppose taxes on either side. With petroleum sectors in producing countries experiencing heavy tax regimes, a fight over rent in the gas sector, using the tax instrument, will give rise to conflicting interests between *treasuries* in consuming and producing countries. The fact that producer’s prices and

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<sup>58</sup> Similar effects on prices to consumers, but with the benefit distributed to producers or producing countries’ treasuries, can be achieved by introducing/raising uniform taxes on producers (across producing countries) and by a cartelization of the supply side. The practical and political competence and possibilities will contribute to a determination of where the rent actually ends up, and which price paths will be realized.

investment risks are not only influenced by market developments, but also by *ex post* political decision-making in consuming nations, means producers might face not only an increased commercial price risk, but also the political risk of market reorganization and tax increases.

The increasing taxes on oil products which have taken place in the OECD area may slow down if competing economies elsewhere do not follow the same policy. The challenge of new economies in Asia is particularly apparent, including the giants China and India, which now have far higher economic growth than the OECD area and a corresponding increase in energy consumption. Strong competition may develop both in markets for products and factor inputs (energy), so that taxes within the OECD area can no longer be increased, and even could be lowered. This may happen if the oil price is high for a longer period of time. As far as taxes on natural gas in the European gas market are concerned, large industrial users will face a regional competitive situation for natural gas as an input factor, while they are globally in a competitive situation for oil as an input factor. In product markets, this industry competes globally in the same way, as does industry that uses oil. This may lead European countries to continue taxing private consumers higher than gas used by industry or for the production of electricity, cf. indications from Table 4.2.

With these reservations, taxes on natural gas may in the future act as revenue generators for the treasuries of consumer countries, as has been the case with taxes on oil products, and as underlined by EU (2003d). In particular, consumer countries may be tempted to increase taxes at the time when the bulk of production potential has been developed in the gas exporting countries, and the producing countries absorbed most of the investments as "sunk costs".<sup>59</sup> It will then be profitable for exporting countries to continue producing, even if profits are far less than expected (in the worst case, at prices towards SRMC, cf. Figure 4.16).

Thus, national European gas taxes may, deliberately or not, serve a similar function to a customs tariff. As such processes may lead to a pressure on

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<sup>59</sup> An excise duty may possibly be used to differentiate between different production areas. This however presupposes that WTO / GATT rules or regulations in the European Energy Charter would allow such discrimination in the future.

exporting countries' prices and the distribution of rent among countries; gas taxation may become a major political issue between energy exporting and importing countries. The political natural gas entrepreneur faces an *ex post* political risk linked to EU taxation of natural gas usage. Therefore, an option for the Norwegian policy makers (together with other gas exporters) is to bring gas taxation into negotiations about trade agreements with the EU and WTO, in the same way as is already generally the case with respect to negative taxes, i.e. subsidies. Alternatively, she could be reticent on investments in some larger fields, and hold back development to demonstrate that increased taxation and rent capturing from the EU's side might deteriorate long-term supply security.

#### **4.8 Market liberalization and the entrepreneurial role of the state**

The EEA agreement referring to Norwegian integration with the EU mainly concerns the maneuvering room and policy options for domestic policy formulation, cf. Chapter 3. To study downstream effects this chapter has looked more closely at the effects of market liberalization and its impact on maneuvering room for the Norwegian natural gas entrepreneur. Constraints towards full market liberalization and their modifying impact on the political entrepreneurship are discussed in Chapter 5.

This chapter demonstrates that a more liberal market leads to greater price volatility; gas prices no longer only react to changes in prices on alternative fuels, but is also reflect the balance between demand for and supply of gas. Larger and more frequent price variations resulted in U.K. and U.S. markets when they were liberalized / deregulated, cf. Figure 4.10 and Chapter 5.5.6. When gas prices rose after 2001 it was because of a better balance between supply and demand, but thereafter also because oil prices were higher. Producers will in the short and medium term (which may be many years) benefit from market liberalization when markets are tight and lose out when they are weak. In principle however, long-term average export price levels may not necessarily change compared to a non-liberalized market, albeit volatility increases. In a weak liberalized market, even though the price to consumers might decline, the *assumed* lower gross

margin for transmission companies may partly fall for producers if regulation is *de facto* efficient. In general, in an over-supply situation prices will decline compared to the old system. In the wake of the implementation of EU gas directives, global and European energy markets have been tight, and prices have rather been higher for producers, as would have been the case if the old system had prevailed.

A more liberal market also leads gas contracts to become more pluralistic and short-term. A spot market and other markets for short-term contracts will develop. In a liberalized natural gas market, both buyers and sellers may desire new long-term agreements, in addition to more short-term sales. When new huge contracts are made directly between producers and customers in the EU, one might expect them to become less long-term than the “old” ones between producers and transmission companies. These were/are of some 20 years in duration. This applies in particular to new contracts, but it may also be the alternative if the development goes so far that existing contracts are dissolved. In weak market situations the TOP problems experienced both in the U.K. and the U.S. could be repeated in Europe. However, as long as we face generally tight energy markets in Europe and elsewhere, TOP problems should not become significant in a liberalized EU gas market.

Before liberalization, transmission companies balance out geographical and sectorial differences in customer demand. These differences will be more directly evident to the producer in a liberalized market. For large producers able to take over the wholesaler function of a transmission system, their contract portfolio may become comprehensive enough to balance out fluctuations in individual markets against the total market. The faster and stronger the market responds to a change in supply and demand, the faster the change in the portfolio of long-term, short-term and spot contracts. Depending on the market balance, a liberalized market provides incentives for both sellers and buyers to dissolve existing long-term contracts. To what extent this leads to a desire to re-negotiate existing (long-term TOP) contracts in Europe depends on the extent to which the existing contract portfolio resembles the portfolio of a given liberalized market. Whether the transmission company or the producer chooses to cancel existing

contracts will depend on market conditions, as well as on financial strength, expectations of future developments and legal bindings.

One consequence for Norwegian gas exporters of increased price volatility and more short-term contracts is that it may be beneficial to have a more flexible way of selling gas than under the old and rather rigid GFU system. The need to integrate downstream also increases; firstly, in order to be able to reap the full benefits of market openings and the sale to new and old, smaller and more diversified customers; secondly, to open for the opportunity of profiting from larger parts of the gas chain than just on the NCS and balance revenues when market conditions and rent distribution change; and; thirdly, to control a market outlet for her gas, especially so as to prepare for when markets once again become weak.

The EU views competition as a prerequisite for cost effectiveness, market sustainability and energy security. The EU emphasizes the benefits of lower operational costs and increased flexibility resulting from liberalization and tougher price competition to the benefit of consumers. The aim of EU liberalization efforts appears to be close to an idealized version of what was described as the third (mature) stage in the evolution of a natural gas market in Chapter 4.1. It also politically matches the neo-functional view of EU (or her: European) developments, as outlined in Chapter 1.3.

This study considers that liberalization of the EU gas market may contribute to improving security-of-supply of gas for consumer countries, by creating an open market with lower prices, by splitting existing producers and production areas in more units, opening the access to transmission transportation and physically building more pipelines and gas storages units. On the other hand, more volatile, uncertain and periodically lower producer prices may lead to a drop in large investment projects and result in a deterioration of security-of-supply in the long-run. Investment decisions will be more of a stop-and-go type, and were not experienced by the industry and the market as it developed in the 1970s-1990s.

*“Competition is in general preferable to monopoly, but not all consumers will benefit from introducing competition” (Ilie, Horobet and Popescu 2007).*

In addition, the EU faces serious challenges on the supply side with respect to attaining general benefits from competition over time. The EU is unable to regulate the most important relevant producers, and natural gas is a non-renewable resource, as outlined in more detail in Chapter 5.3-4.

The general high energy prices after the EU gas directives were introduced have to some extent over-shadowed the underlying problems on the supply side. Investment decisions, for example, in the Ormen Lange field were made on the basis of more short-term contracts than the old TOP ones. If the market continues growing, prices will remain high and the investment will pay back. The Ormen Lange field is phased into the growing British market which faces a decline in domestic production, and is as a consequence less risky than when a new market (segments) is being developed, cf. the discussion in Chapter 5.6. The problem is increasingly linked to situations where the market must be considered immature and/or volumes coming from large investments in production and transmission must be orchestrated into new market segments (by sector or region). Consequently, for Norway, new investments will be more risky when, for example, she builds pipelines to emerging and smaller markets in Sweden and Denmark and for new pipeline projects to Poland, than to the established U.K. market and to the Continent. Investments can also be more risky in the Northern Areas where costs are higher, weather conditions harsher and distances to markets longer. The Russians have, for example, claimed that they will not develop the Shtokman field without TOP contracts ([www.gazprom.ru](http://www.gazprom.ru)).

When downstream markets are changing, the Norwegian state is affected as a political entrepreneur, both in terms of its position as producer and policy maker. Even when these changes do not formally affect domestic industrial organization and behavior, their impacts on market prices and terms of operation may be of the greatest importance. If changes become formal through law or regulations, the domestic maneuvering room will also be affected through the EEA agreement. With respect to entrepreneurship it will be the state's relative ability to develop strategies and policy that determines whether defined goals can be defended when downstream markets are liberalized. From a Neo-Schumpeterian perspective seeking to understand the role of the state as a political entrepreneur maintaining and creating competitive advantages, it is important to understand

EU motives and policies and to always be in the lead to influence these, as well as to take the necessary precautions and adopt strategies that avoid problems and exploit opportunities. It is not enough to just copy laws and regulations passively and continuing to sell gas as before. In integrated economies traditional trade policy measures are replaced by “hidden” barrier spill-over effects and implemented by interpreting and adapting in a national mode to common rules and regulations when national interests are to be defended, cf. Chapter 1.4. It is the combined dynamism of technological, commercial *and political* ability to innovate that will be decisive for the NGF position after liberalization.

However, political entrepreneurship must (and should) in a liberal market framework operate in a more regulative than in an interventionist style, as was the case before. The state can however increase the (relative) roles of its own (fully owned) companies under liberalization, in order to defend nationally defined goals, as discussed in Chapter 3.4-6. The state can also encourage StatoilHydro (informally as majority owner or formally through the general assembly) and help the company go downstream through bilateral political channels.

As harmonization of taxation of energy consumption may lead to a pressure on exporting countries’ prices and redistribution of rent to consuming countries’ treasuries, gas taxation may become a political issue for European gas producers in their relations to the EU, in the same way as negative taxes (i.e. subsidies) and tariffs are. The worst-case scenario for exporters occurs when fields and pipelines are “fully” developed. At this stage, most producers’ costs are sunk, and producers have no alternative but to continue supplying gas through existing facilities and grids even though prices are well below what was expected. At the most (theoretical) extreme, if no new capacity can be developed, the EU could raise taxes to the point where producers’ prices just covered a little more than variable costs.

Norway may in her mature industrial parts, adapt to increased natural gas market liberalization by increased downstream activities, and at the same time develop a more diversified contract portfolio through regulatory innovation at home, and a change of downstream sales, investments and political relations,

both to the EU and to individual EU member countries. The market openings would be an opportunity to be exploited. Taxes on oil products have the positive effect that they contribute to higher prices on gas. Taxes on natural gas consumption are, however, clearly not in Norwegian interests, and may over time become a far more serious threat to the state's natural gas revenues than market liberalization/reorganization. Part of the problem lies in the fact that taxes may be increased after the contracts have been signed and the infrastructure developed.

Taken together, the Norwegian state took an entrepreneurial economic and political risk in building an *ex ante* non-existing Norwegian petroleum industry and creating a national natural gas policy as part of this. With the close to total reliance on EU markets as outlets for her natural gas, this has shifted to an *ex post* political risk linked to; a) EU demands for the reorganization of the Norwegian industry and its impacts on control and profitability of sunk and future investments, cf. Chapter 3; b) market developments and EU reorganization and other political actions that influence market terms and prices, cf. Chapter 4.4-5; and c) taxation of natural gas usage that could work for the EU as an optimal tariff and transfer rent from the treasuries of producing countries to EU countries' treasuries, cf. Chapter 4.7.

However, a risk also represents an opportunity to be exploited, cf. Chapter 1.1. While Chapter 3 demonstrated that the effects of domestic changes were modest and to some extent even necessary, Chapter 4 has discussed how effects from market liberalization can also be beneficial for Norway, when actively met in commercial and political terms. The special structure on the supply side in the European gas market may and should however lead to reticence on the part of the EU in connection with both "extreme" market liberalization and natural gas taxation. If long-term stability and growth of the European gas market is to be secured, energy taxes should to a larger extent than today, be set to reflect each carrier's environmental benefits and costs. Taxes on gas should be lower than on other fossil fuels and liberalization should take a form that increases gas consumption. Among fossil fuels, natural gas is the environment's "best friend". This does not harmonize with the EU (2003d) directive of an equal rise in gas and coal taxation. Low gas taxes would benefit producers through more stable and

foreseeable prices, consuming countries through stable and continued increases in supplies, and it would give all involved parties a better environment. In a strategic perspective, consuming countries should wish lower producer prices (caused by liberalization or taxation) only after most large investments in production capacity have been made, and when they turn their attention towards other energy carriers as increasingly more important in the energy portfolio.

A central task in Norway's natural gas entrepreneurship in the process of liberalization is the need to remain alert to shifts in prices, market situations and degrees and scope of changes in political regulations, interventions and institutions. If a full liberalization of the market takes place, Norwegian natural gas policy ought to be designed differently than if the market remains imperfect. The first stage (cf. Chapter 4.1) of a natural gas market development requires long-term investments, along with the commercial and political securing of long-term contracts in interdependent relationships. Reaching the third stage via the second, downstream market terms and prices, and political regulations and interventions, eventually become more important than relations to single purchasing companies and countries. Exporters will benefit by arranging natural gas activities in ways that make it possible to exploit the opportunity of entering into smaller and more diverse contracts, increased downstream investments and securing market access. The interest in maintaining as much market power as possible is not abolished, but it becomes important to ensure that a greater number of actors can take care of more diversified market operations.

Liberalization and maturation of the market in its third stage makes it necessary for the Norwegian political natural gas entrepreneurship to become more regulative than interventionist (as under the GFU/FU system) in most commercial deals. However, the market situation for a long time will remain a mixture, where market segments will still be in their first or second stages, and the merging of large downstream actors may impede competition in its mature parts (third stage). To avoid over-supply and maintain a tight balance between total supply and demand it will be important how the combined supply from all exporters to the market adds up. The increased interest in overall market development is shared with other exporters (such as Russia) and the competitive elements between producers will as a consequence, become less predominant. A

mature European gas market, which is politically influenced by the EU, adds a new dimension in Norwegian energy and foreign policy with respect to Russia.



## 5 Constraints to market liberalization and the political entrepreneurship

Chapter 4 described how a fully liberalized European gas market might look like, and discussed its impacts on prices, contracts and the Norwegian state's natural gas entrepreneurship. The present EU natural gas market liberalization is however by no means complete, under which Norwegian influence and adaptation must be understood. To reach closer to an idealized market design, as outlined in Chapter 4.3, is neither a straightforward process. Constraints are economic, geological and environmental, and are in Europe not only an intra-EU matter, but part of an international political framework. Competing national and international interests, natural monopolies in transmission and distribution and the non-renewable nature of natural gas challenge the process. Scope and strength of political and non-political change influence prices and terms of operation, and hence the *de facto* domestic and downstream maneuvering room for the political entrepreneur.

This chapter discusses main factors and mechanisms that constrain the EU's ability to reach a complete liberalization of her natural gas market, and their modifying effects on the Norwegian natural gas entrepreneurship as compared to full liberalization. Firstly, general challenges to energy-related EU policy are briefly outlined. Secondly, the uncertainty as to what extent the EU will succeed in a making comprehensive or common natural gas policy, or that an essential part of it remains on national levels is discussed. Thirdly, the politicization of trans- and intercontinental European energy trade and the issues of security-of-supply and security-of-demand are addressed. Fourthly, the non-renewable nature of natural gas is discussed; the more you take out the less is left for the future. Fifthly, regulatory challenges in natural gas markets are analyzed; usually under regulation only second- or third-best solutions are attainable, open for

relatively wide interpretations and arguments made by affected parties. Finally, remarks on the modifying consequences of the Norwegian state's natural gas entrepreneurship from the constraints to market liberalization discussed, are proposed.

## **5.1 Energy challenges for the EU**

With almost 500 million people after the last expansion to 27 countries (2007), EU energy consumption represents some 18 % of world consumption, only surpassed by the U.S. (23%). The dominant fuel is oil (40% of total), but natural gas is by far the fastest growing fuel source. Natural gas accounted for 24 % of EU consumption in 2005. Natural gas usage has increased both due to higher overall energy demand and a decline in coal consumption from 20 % in 1991 to 17 % in 2005. Nuclear production has been quite stable and represented 13 % of total energy consumption in 2005, while hydro electricity accounted for 4 %. This leaves only 2 % for other renewable energy sources, comprising wind, geothermal, solar, biofuels and others (EIA 2006).

83 % of EU energy consumption consisted in 2007 of fossil fuels (oil, gas and coal), and the EU possesses only minor parts of world reserves of these fuels. The exposure to external price and supply shocks poses questions concerned with the sustainability of future energy supply, energy mix and efficiency, as well as geopolitical balances. Rapidly rising fuel prices and possible supply disruptions can have serious consequences for economic growth, political stability and EU's competitive position. The increased import dependency makes EU economies potentially sensitive and vulnerable to external events, cf. Chapter 5.3.1. Expressed worries over the development of the structure of the Russian oil and gas sector, and on gas (and oil) transit problems through Ukraine and Byelorussia (Stern 2006, Bruce 2005), illustrate that such issues are now higher on the EU political agenda than in the 1990s, when downstream market liberalization and efficiency were in focus. Political unrest in the Middle East is another reason for reinforced attention on energy issues.

Although usage of non-fossil fuels and renewable energy sources are expected to grow in the coming years, the bulk of increases in energy demand is

expected to continue coming from exhaustibles unless not only incremental technological improvements, but a substantial technological breakthrough, occurs. While 50% of EU energy consumption is imported now, indications are that about 70% of overall energy requirements will be imported in 20 to 30 years (EU 2006a). In particular, increases in natural gas consumption and imports are expected, while oil and coal consumption is expected to remain stable.<sup>60</sup> Most analyses show that the high relative dependency on fossil fuels in overall energy demand will be retained in the coming decades.

Impediments in natural gas market liberalization and tight energy markets are increasingly challenging the EU to improve the situation beyond hitherto efforts, as outlined for natural gas in Chapter 4.6. The situation is linked to other economic and political issues. One issue is the renewed security-of-supply concerns. The bilateral aspects of European natural gas trade and the internationalization of most other markets have made energy central to EU external relations. EU energy prices depend heavily on global energy prices, first of all crude oil prices, and she needs more natural gas imports from a number of non-member countries, first of all Russia, but also Central Asia, Africa and possibly the Persian Gulf. Neither the intra-EU energy situation, nor her policy options, can be seen isolated from global energy markets, international affairs and bi- and multilateral relations (EU 2006a, EU 2007a).

Another issue is that the EU also aims to reduce emissions and other environmental damages from energy production and usage. Energy usage's link to environmental issues highlights the emission of greenhouse gases and their implications for climate change, air quality in densely populated areas and others issues. Reduction of energy usage, improvement in energy efficiency and development of clean technologies could help the environment.

For the EU, the challenge exists of enhancing environmental standards and securing energy supply, and at the same time keeping the European economy

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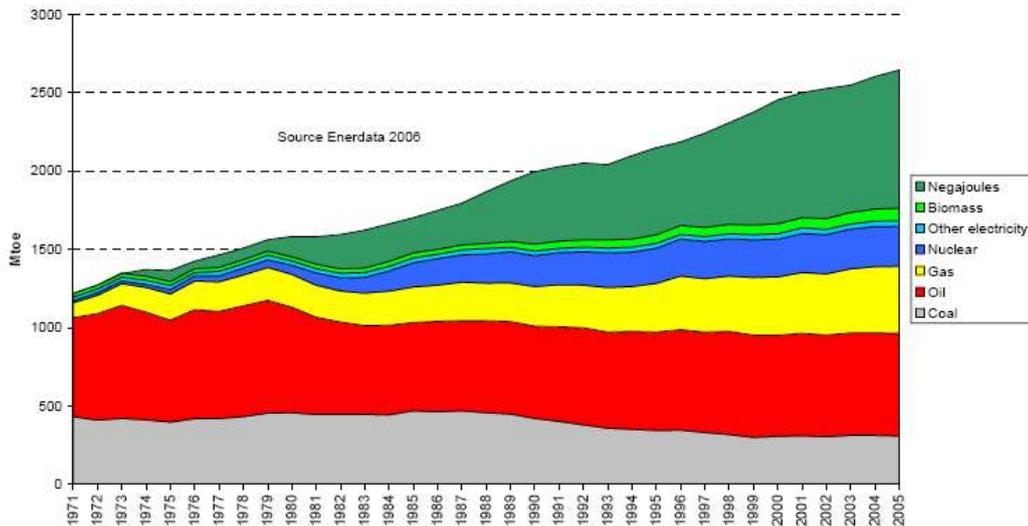
<sup>60</sup> Linde and Stern (2004) however questions the realism in these types of 'consensus' natural gas demand forecasts. No forecast is better than the assumptions they are based on. They can nevertheless be a point of departure for our discussion.

competitive on the global stage. The challenge creates a pressure for new and more comprehensive EU policies, as well as actions on national, regional and city levels. The EU has yet to develop a common energy policy or a comprehensive policy to deal with these inter-related issues.

Besides natural gas imports, most important for the EU is improved efficiency in energy usage. Energy demand is determined by factors such as economic activity, weather conditions and behavioral pattern among consumers. The measurement of 'energy intensity' has been used to determine how these activities translate into energy demand. This broad indicator is defined as energy consumption per unit of GDP. It reflects a series of factors, such as technical efficiency of energy usage, productivity increases and structural changes such a relocation of production or sector re-composition.

In the EU, energy intensity has fallen sharply for the new member states (EU-12), and to a lesser extent for the older ones (EU-15) over the last years. However, historically the EU-12 countries operated at higher energy intensity levels and have as a consequence approached the levels of the EU-15. Due to efficiency improvements, reflected in lower energy intensities, final energy demand is growing marginally faster than primary energy demand. As is shown in Figure 5.1, energy demand would have been much higher today without efficiency improvements in energy usage over the past 3-4 decades; rather than a 100% increase in energy usage over the period if the same technology had been used as in the early 1970s, the actual increase has been 'only' some 50 %.

Figure 5.1: Primary energy demand and “negajoules” in EU-25  
1971-2005



“Negajoules”: energy savings calculated on the basis of 1971 energy intensity. Source: EU 2006b:5

Improved energy efficiency helps reduce costs for the industry, reduce emissions and other environmental damages, as well as reduce import dependency. Hence, energy efficiency is a very important element in approaching all EU energy political goals. Improvements have been realized mainly through better final energy usage in power stations, refineries, combustion engines and boilers. Also reduced losses in transmission and insulation of buildings have helped. In the transportation sector reduced consumption of gasoline and diesel in vehicles as well as social, economic and organizational changes has been significant. Energy efficiency improvement has actually been the most important growing “source” of energy supply over the past three decades. Energy consumption connected with savings will be even more important in the future. Much rationalization in transportation, and in energy supply and consumption, is perceived to be largely untapped.

An important element in natural gas demand growth is the need for more electric power, cf. Figure 4.2. Power production based on oil and coal declines rapidly, while nuclear power production has been expected to marginally

decline. 57 % of EU electricity production was based on fossil fuels in 2003. This share is expected to increase, in spite of a steady growth in the use of renewable sources. The declines in oil generation capacity, coupled with a strong expected growth in electricity demand, should be met with a dramatic increase in the use of gas turbine combined cycle plants and small gas turbines. The (previously) expected 10 times capacity increase in gas fired power plants should rise its share of total installed electric power capacity to 45 % by 2020 (EU 1999).

The alternatives to gas as the cleanest form of energy are not many. For one, nuclear power has been considered an unlikely alternative. Even in governments where nuclear power is thought of as a safe form of energy, public opinion has largely been against the building of new plants.<sup>61</sup> Secondly, new oil and coal power plants are also expensive when they have to remove or reduce their emissions. These power plants will regardless release more CO<sub>2</sub> per produced unit of electricity than a gas power plant. Until renewable energy sources (sun, wind, bio, wave energy or others) become more profitable than has been the case, there will internationally not be any production of power that is more environmentally friendly than gas power. Gas power becomes particularly advantageous when the plants can combine the production of heat and electricity (combined heat and power, CHP) for an industrial plant or local community.

The increase in the number of gas power plants is already high and may become even higher, as the previous plan economies of the East-European countries are adapting to relatively strict EU environmental standards. This means that gas may receive an implicit price premium relative to other fossil fuels because the cleaning costs for gas will be lower than for oil and coal. In practice gas prices should be expected to increasingly be indexed against the price of electricity. Increased demand for gas for producing electricity and the liberalization of the electricity market is, through environmental concern, a driving force also for the liberalization of the gas market.

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<sup>61</sup> With the historical high oil prices over the past years this may change and nuclear power production will most likely increase again. Finland is for example about to finish its fifth plant.

The climate agreement in Kyoto from 1997 commits industrial countries to reducing the total emission of climate gases (including carbon dioxide, methane, nitrous oxide, hydrofluoric carbons, etc.). The reduction is to be 5.2 percent in the year 2012 relative to the level in 1990. This will mean a reduction of 30 percent relative to emissions if no action had been taken (EU 2006a). The distribution of these emission reductions is skewed. EU must reduce their emissions by 8 percent, the U.S. with 7 percent and Japan with 6 percent. Norway, Iceland and Australia are the only three countries that may increase their emissions, Norway with 1 percent.

The climate agreement opens up for the common implementation of actions. Norway may for instance pay for an action in Poland and have the emission reductions credited her Norwegian climate account. Any trade in quotas will come as a supplement to actions in each country (not as full replacement). Under the 1997 Kyoto Protocol<sup>62</sup>, the EU is obliged to reduce its greenhouse gas emissions to 8 % under the 1990 level by 2008-2012. In 2003, the EU Parliament and Council issued a Directive (EU 2003c) establishing an emission-trading scheme, which became operational in January 2005. According to this directive all emitting undertakings must hold an emission permit from their government. Emission needs higher or lower than the allocated emission rights, can be bought and sold in the market or saved for future use. A number of directives have also been passed to reduce emissions from cars and industry and some are under preparation e.g. to protect the ozone layer.

The proposal of a common CO<sub>2</sub> tax for the EU had to be shelved in the early 1990s. The excise taxes suggested were however introduced relatively quickly without a directive (Reinsch, Considine and MacKay 1994). Even though environmental arguments are often voiced to support the introduction or increase of excise taxes on petroleum, the severe increase in oil product taxes in the last decade is mostly due to other causes. The most important reason seems to be fiscal, i.e. that energy taxes have become an important source of finance for public budgets, cf. Chapter 4.7.

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<sup>62</sup> As of May 2008, 182 parties have ratified the protocol ([en.wikipedia.org](http://en.wikipedia.org)).

Environmental policy has in general become central for oil and gas policies in the EU, Norway and elsewhere. Not only is there a strong interest in environmental effects among the population and among the leaders of some European countries. There are also forces within the EU Commission and in the EU parliament who regards environmental policy as a highly prioritized area, where at the same time energy is a continuously more attractive product to tax in order to cover fiscal needs. In an international context, the EU was an important driving force early in the 1990s, and Norway has supported such a policy, even though it has become clearer that there is a conflict of interest between the oil and gas on one side, and environmental policy on the other. The Norwegian debate about the construction of gas power plants is closely tied to the introduction of trade in CO<sub>2</sub> quotas. In this debate there are often strong coalitions from outside the energy sector leading the process.

To further improve the environment, the Commission proposed that 20 % of its energy mix should come from renewables by 2020 (from the present 6 %), whereas biofuels should have a minimum target of 10 % (EU 2007a). Spending on energy research should increase by at least 50 % over the next 7 years, with the aim of being in the forefront of the rapidly growing low carbon technology sector. Development of cleaner coal based electricity plants should be emphasized, as reserves for coal are substantial also within the EU. Both coal and gas based on power plants should develop a program for the capture of CO<sub>2</sub>.

If these proposals are implemented, the EU will become a world leader in efforts to reduce environmental damage from human activity. If implemented, it will also increase the chance of developing a more comprehensive and common energy policy. Competition policy as the only approach to liberalizing the market for natural gas represents a unidisciplinary approach addressing the issue mostly with measures based upon the regulation of non-competitive markets of "normal" goods and services, cf. the Introduction Chapter and Chapter 4.6. It is however, difficult to see how the EU can simultaneously achieve lower gas prices to consumers from market openings and liberalization, high tax revenues from gas usage, and a growth in both demand and natural gas supplies, as expected. As a consequence, in energy-related policy she constantly faces conflicting goals.

The principles of market liberalization are challenged by an element of interest conflict, also between outside producers and the EU. The EU considers for example that it is beneficial to have large companies in the energy sector in order to maintain a strong purchasing power in the natural gas market, even if excessive market power in certain regions can limit the benefit and possibility of competition and a more open and flexible market (EU 2005a:18). The EU has a fear that foreign gas producers can obtain a disproportionate market power. External relations are perceived to inhibit elements of conflicting interests in how producing countries behave, and how the EU organizes her markets.

Policies that aim to either improve competitiveness, supply security or the environment are often contradictory. For example, switching fuels from domestic coal to imported gas reduces CO<sub>2</sub> emissions, but contributes to an increased dependence on natural gas imports. Accordingly, the Commission has increasingly focused attention on coordinating policies for the three areas (EU 2005b, 2006a). In the “An energy policy for Europe” report the Commission set the goal of a 13 % reduction in energy consumption by 2020 compared to 2006, to be reached by a 20 % saving on improved energy efficiency (EU 2007a). The proposal comprises an acceleration and emphasis on all the processes already contributing to energy savings, besides a new international agreement on energy efficiency.

The plan is premised on the belief that the EU should speak with one “coherent and credible” voice in external affairs, acknowledging that the EU cannot achieve its energy and environmental objectives only on its own, along with a neo-functional view on EU developments, cf. Chapter 1.3. The common external energy policy should also deal with external energy supply crises, and strengthen the Energy Charter Treaty (IEA 1995) and post-Kyoto climate regime, such as in relation to Russia and when extending the emission-trading regime to global partners. In this proposed new (common) European energy policy, sector enquiry, strategic review and the plan of action should seek in a united manner to move from principles to concrete legislative proposals in 2008.

The need for a common EU energy policy appears to be evident from EU market arguments about overall efficiency and security-of-supply. This would

also help market liberalization efforts. To which extent such policy will follow general competition principles, or is modified with respect to the particularities of natural gas as an imported non-renewable resource is however worthy of debate. Overall integration trends on national levels, as well as specific market integration will be important, and can vary across countries. In such a situation, different views on how EU policy should be understood and developed are contrasted against each other, cf. Chapter 1.3.

As a consequence, it is important to address the economic and political impediments and constraints to full market liberalization; especially when assessing its *de facto* impact on the Norwegian state's natural gas entrepreneurship. We shall discuss four main such constraints; a) intra-EU affairs; b) external political situations and relations; c) the non-renewable nature of natural gas; and d) regulatory challenges in a by-nature imperfect natural gas markets. The constraints express a need to improve the systemic understanding of market mechanisms by extending disciplinary boundaries, cf. the Introductory Chapter. To only provide more information and refinements to support the microeconomic design of hitherto EU liberalization efforts to improve the situation, can in this context be considered trivial. Combined in a multidisciplinary manner, the interaction between the four constraints discussed and bridged in an IPE framework can provide a better understanding of the situation in the EU natural gas market, and how it might evolve. The analyses can also provide clarifications of the kind and magnitude of the structural uncertainty remaining, and provide insight into processes of adaptation. The understanding of systemic and structural uncertainty helps understanding the entrepreneurial maneuvering room across issues and disciplines.

## **5.2 Intra-EU political constraints to market liberalization**

The policy aiming to make EU gas and electricity markets work in a more liberal way has been based on a process of opening national markets, easing border crossings and enhancing competition, cf. Chapter 4.6. The developments are however not uniform across countries. Two main shortcomings to the policy can be observed. Firstly, in some EU countries large gas companies have consolidated rather than weakened their positions, as seen for example through the E.ON –

Ruhrgas and Gaz de France – Suez mergers. In many new member states nationally state-controlled electricity and gas owners are still active (EU 2005a). Secondly, different regulatory practices in member states hamper the free flow of natural gas. The individual nation states define how tariffs and terms of operation are to be determined when adhering to the EU gas directives. The single most important country, Germany, has even chosen negotiated rather than regulated tariffs.

Hence, gas (and electricity) markets have become more open and ‘liberal’ than before, but are in many cases still far from being *de facto* fully liberalized. The shortcomings give an important backdrop for how the EU might consider the implementation of more comprehensive policies, including stronger regulations, interlinked with other relevant policy areas concerning security-of-supply, the environment and others things, cf. Chapter 5.1. The EU has however, only to a limited degree harmonized policies across member states in the energy sector, and has a largely confederative political structure. In contrast to other liberalized markets, in the U.S. and the U.K. for example, authority rests with governments with authority over all, or at least most, of the relevant gas chain.

The perspective of achieving a common energy policy is supported by a neo-functional view that economic integration leads to political integration, with accompanying legal, institutional and ideological changes and increasingly more power to Brussels, as discussed in Chapter 1.3. The discussion demonstrated however, that this view is challenged by intergovernmentalists, claiming that the nation-state will resist the gradual transfer of supranational authority to EU institutions. The bargaining and consensus-building techniques developed in the EU should be reinforced, instead of the ultimate transfer of power to supranational EU institutions, if necessary with “package deals and side payments” (Pollack 2005:18). Institutionalists would on their side argue that institutions also lead to lock-ins, as well as they could provide a path-dependent behavior among actors and resistance to the pressures of policy harmonization. In the constructivist school of thought, preferences become an explanatory variable shedding light on political action and negotiating outcomes, and a dependent variable explained by constituting frameworks. Neo-functionalists and constructivists point to the potential for further integration through functional

and political spillovers, and respectively through changes in identities and preferences resulting from cooperation over time. Intergovernmentalists and institutionalists are more skeptical to both spillovers and socialization, and anticipate that policy will continue to be determined by inter-state processes.

How can EU energy policy be understood by the different schools of thought briefly sketched above? So far, energy policy in the EU has largely been synonymous with competition policy, although elements of the second gas directive open for exceptions and the importance of the timing of market openings. This policy approach is mostly however part of the neo-functional school of thought. In order to improve the shortcomings of the present status of the market, the Commission has proposed the implementation of stronger common measures (EU 2007a). Member states may not, however, necessarily transfer such power to Brussels when considering their relative independence to secure energy supplies.

*“Since the European Community came into being, member states have been unwilling to give up their sovereignty in energy matters, considering the stakes to be too high with respect to their national interests in the area of energy dependence and control of their resources” (Finon and Locatelli 2007:21).*

Conflicting interests and views as to how the EU should be understood and develop may obstruct the realization of a common energy policy. Since natural gas appears to be a strategic commodity, each country might desire to secure themselves rather than primarily being concerned with the situation for the entire Community; to the extent that these goals contradict each other. Andersen and Sitter (2009) list in this context four major patterns (or types) of integration in a sector:

1. *Homogeneous integration* based on clearly defined EU rules and regulations with precise organizational requirements implemented more or less uniformly by states, subject to effective supervision and evaluation and often based on competition policy.
2. *Aligned integration* relies on mutually *reinforcing* overlap of state and EU-level interest. EU rules are now more loosely defined, but several states share the same general interests as those expressed in an EU directive,

and therefore proceed according to the spirit of the law even if this is not strictly required.

3. *Autonomous integration* takes place in situations where the central demands for particular organizational and behavioral patterns are weak, and local pressure to maintain existing practices is strong. Perhaps the most common pattern is one in which a number of governments object to strict EU rules, and directives are therefore vague on a number of points.
4. *Deviant integration* is in principle an illegal circumvention of EU law. This situation features strict EU legal requirements and expectations about loyal national implementation, but at the same time strong local resistance.

Andersen and Sitter conclude that the impact of European integration may vary almost as much within as between sectors, as well as between countries. In the case of natural gas, some states progress quickly towards liberalization while others make only minimal efforts. In effect, the Commission's drive for liberalization yields homogeneous integration only with respect to limited policy initiatives, such as price transparency for electricity and gas contracts. Rather than homogenous integration,

*"the move to competitive markets in the energy sector, as in many other sectors, is better characterized as aligned or autonomous integration," (ibid.).*

The exception is the UK where EU directives could legitimize national practices already in place. For other states, EU demands for particular organizational and behavioral patterns appear as weak, and local pressure to retain existing practices remain strong. This parallels the situation for Norway as discussed in Chapter 3.

*"EU level decisions often omit sensitive issues and formulate standards that allow considerable flexibility in national transposition and implementation, as it did in the gas case".. "The EU directives hence were designed to accommodate national demand for autonomy and regulatory diversity. Deviant integration has been a less common pattern in the energy case, except insofar as the Commission's progress reports regularly show that a number of states are quite far behind schedule in terms of opening gas markets" (ibid.).*

However, EU efforts to achieve gas market liberalization

*“has been successful in terms of bringing about an overall shift towards a more liberal paradigm, where the idea of free markets in gas seem to have won thought, this has so far brought about more mixed results in terms of actual market opening and competition” (ibid.).*

Hence, not supporting common actions involves costs for member states. Policies may continue to be harmonized, but it is likely that national and commercial actors and actions will also remain important. A full liberalization of the intra-EU gas market according to only the principles of competition appears nevertheless less likely, if not impossible. Core countries will most likely (also) take national steps to improve their energy situation. Even if the EU succeeds in changing policy *de jure*, the result can be mixed, where rules and regulations are common, but they are open to wide interpretations by governments, companies and courts, cf. the discussion of Norway’s adaptation to the first gas directive in Chapter 3.

However, over time common policies may gradually become more dominant, especially if/when prices drop, and scarcity and international aspects of the market appears less dominant than when prices are high. In the light of intra-EU problems with respect to agreeing about supranational regulations in the energy sector, it appears rather doubtful that she will manage to set up an EU regulator capable of ensuring the *de facto* harmonization of transportation tariffs and practices across the Union (EU 2007b), even if she might succeed doing it *de jure*.

It is important for exporters to know the EU’s plan for policy and implementation. A central task for the Norwegian natural gas entrepreneurship, as the market becomes more open and flexible, is to understand the ways in which this will happen. In some segments of up- and downstream markets, where growth is strong and the infrastructure is not that comprehensive, markets can still be considered to be in their infant or youth (first or second) stages. The market situation is better described as a mixture of the three stages discussed in Chapter 4.1, rather than as fully liberalized, as outlined in Chapter 4.3. Generally, imperfect markets are the source of a larger maneuvering room for an entrepreneur (Kirzner 1999). In commercial terms more or less temporarily

market imperfections might be exploited for better prices and contracts. In political terms in a situation where the EU more or less is unable to act, the opportunity to influence decisions on both national and EU levels increases.

For the Norwegian natural gas entrepreneur, as a consequence, it will be important to be active with respect to both EU countries and the EU itself when it comes to understanding and possibly influencing the shape of the future domestic and downstream market maneuvering room. The future result can be greater EU demands for the reorganization of the Norwegian industry, including a regulator at the (federal) EU level, and political reorganization and other actions that will influence downstream market conditions and prices. On the other hand, the result can also be that national interpretation and adaptation remains important and even becomes more flexible compared to an EU harmonization, with national governments, but also even larger companies, *de facto* dominating and defining the situation in important market segments.

In both cases, transnational commercial alliances between gas champions will remain important and it remains essential for the Norwegian state to interact with (and in some cases counteract) these, through its own champion StatoilHydro, as well as with the individual national governments in the EU and the EU itself on the political level. At the same time, a risk is that the companies may capture the EU's or Norway's, or both's, decision making for their own purposes. Furthermore, as the discussion in Chapter 4 demonstrated, the commercial and political relationship to other exporters is also more important when the market becomes more open and flexible, and terms of operation converge.

### **5.3 External political constraints to market liberalization**

In addition to constraints from intra-EU affairs, the EU also faces external political challenges because most gas is, and almost all new gas must be, imported from non-EU countries in large amounts. Many of the exporting and transit countries for this gas have tense relations with each other, potential tensions with the EU and some are politically unstable. Few sources and routes of transportation make the system vulnerable, cf. Chapter 4.1. Consequently, the

second constraint discussed that obstructs a straight-forward liberalization of the EU gas market is international and European affairs, encompassing the politicization of trans- and intercontinental natural gas trade and the consequences of this for supply and demand security.

### **5.3.1 Security-of-supply and security-of-demand**

Concerns for energy-security, to secure supply for import-dependent countries and ensure stable demand for countries investing heavily in the extraction and export of energy is not novel. In fact it has been a political preoccupation ever since coal, oil and gas became a driving force in industrialization and a precondition for modern society. The strategic importance of energy has added a political dimension to the discussion about how liberalization of energy-markets may increase economic efficiency, and thus stimulate growth. For oil and import-dependent countries in the West this became particularly apparent during the oil crisis in 1974, when Arab members of OPEC used oil for political leverage against countries that had supported Israel in the 1973 Arab-Israeli War. More recently, in 2005-6, the Ukrainian government claimed that Gazprom's decision to limit gas exports to Ukraine was part of a Russian strategy to interfere in Ukrainian politics. Regardless of how one considers the political motivations and results of the 1974 oil-crisis and the 2005-6 gas crisis, in both cases the actions of the exporting countries were instrumental in increasing the price of energy, and thus revenues from energy exports. In flexing their muscles, both OPEC and Russia brought about a redistribution of wealth from energy importing countries to energy exporting states.

As a critical and fast growing source of energy, natural gas is important for the security-of-energy-supply and the economic development of the EU. Similarly, for countries exporting to this market, costs and revenues are significant for their welfare. The substantial European gas trade that has grown rapidly since the 1970s, has created interdependence between exporting and importing countries. Both can become sensitive and vulnerable (Keohane and Nye 1977) to changes in prices supply and market access. Expensive pipelines link buyers, transporters and sellers in different countries tightly together on a long-term basis, making European gas trade relevant for bi- and multilateral

European and international affairs. The more imperfect the market, the more important the behavior of the participants in political, regulative and commercial terms. Social first-best solutions as defined in economics, may not be attainable in such markets, and policy choices must be selected from alternative second or third-best alternatives. Long-term bindings in the European natural gas markets, caused by the huge cost of the pipeline infrastructure, represent an additional challenge compared to supply and demand security problems in the oil market, where parties can change constellations more rapidly.

The substantial European gas trade has created interdependence between exporting, transit and importing countries. This mutual dependence is reciprocal, but not necessarily symmetrical. If asymmetrical, it can be a source of power for the one and a weakness for the other:

*“A less dependent actor in a relationship often has a significant political resource, because changes in the relationship will be less costly to that actor than to its partners” (Keohane and Nye 1977:11).*

Consequently, international ‘political economy revival’ is defined by Odell and Willet (1993:5) as

*“the study of reciprocal effects of the pursuit of wealth, security and power in international relations.”*

Problems and risks of security-of-supply for natural gas importers and security-of-demand for exporters are linked to the degree and type of mutual dependency. The IEA has set out two broad categories for gas security risks for natural gas *importing* countries (IEA 1995:17):

*“Long-term risk that new supplies cannot be brought on stream to meet growing demand for either economic or political reasons;*

*Risk of disruptions to existing supplies such as political disruptions, accidents or extreme weather conditions”*

Risks are connected to the

*“threats of supply and price disruptions arising from risks associated with the sources of gas supplies, the transit of gas supplies and the facilities through which gas is delivered” (Stern 2002:6).*

The operational dimension entails dealing with variations in demand, commercial storage etc. The political, or strategic, dimension is linked to the possibility of major breakdowns in production or infrastructure caused by political (such as terrorism or antagonistic behavior by another country) or non-political (such as natural disasters and accidents) factors. As gas is a non-renewable resource, long-term supply risk is concerned with investments in new field developments, at least to replace decline in old fields or to increase production sufficiently to meet expected demand growth. Producers are similarly concerned with security-of-demand for gas in terms of market access and price disruptions (a dramatic price drop in their case), transit issues and the functioning of up- and downstream infrastructural facilities.

The potential risk faced by both importers and exporters results from the interdependence created by increases in international trade. For a consuming country import dependency has been defined as a situation where it does not possess the capacity to produce 100 per cent of its own needs (Hogan and Mossavar-Rahmani 1987:8). A similar definition for a producing country would be a situation where domestic customers are unable to consume 100 per cent of production. According to such definitions most countries are dependent on imports across a whole range of commodities, and on exports of fewer commodities (because countries specialize) to pay for the imports. Dependency on exporting and importing goods, and services to and from other countries, is the normal state of affairs in a modern society, and a consequence of increased economic integration.

Political concern arises when dependency causes short or long-term problems with significant changes in prices, supply or market access. An importing country can be somewhere in the continuum between *neutral*, *sensitive* or *vulnerable* in its dependency on a commodity when its price or availability changes. An exporting country is similarly concerned about change in prices and market access. The character of the dependency faced by a country will be a function of the magnitude and duration of change, the country's ability to adjust to the change, and the importance of the commodity in the economy.

*Neutral dependence* is here defined as a situation when a country exports or imports a commodity, and always has an alternative if one of the customers or suppliers disappears. This is a situation very much equivalent to the one assumed to exist in contestable markets; there are numerous suppliers and customers and none of them has any influence on market outcome. If one supplier or customer, respectively, withdraws from a relationship there will always be someone in the market to fill the empty place. In such a situation, there would be no concern over supply or demand security.

Supply and demand problems arise when markets are imperfect; when sellers and buyers are to some degree locked together. A change in price or availability will lead to changes in costs (or revenues for exporters), and/or access to the commodity (or markets). The response must then be to adjust to the new situation, rather than just change to another seller (or buyer). *Sensitivity dependence* is in this context measured by the degree of responsiveness within an existing policy framework. It may reflect the difficulty of changing policy within a short time and/or bindings to domestic or international rules, when price or availability /market access change dramatically.

*Vulnerability dependence* is more serious and measures the ability to adjust to changes *after* policies have been changed (Keohane and Nye 1977:12-18). In economic terms, vulnerability dependence can be represented as the potential for significant losses of output or welfare. Sensitivity dependence, on the other hand, does not need to induce a welfare loss in the long-run when circumstances change. Vulnerability dependence is primarily concern with long-term supply and demand issues, while sensitivity dependency to a greater extent concerns the risk of disruptions to existing supplies. Sensitivity dependence occurs in

*"the short-run or when normative constraints are high and international rules are binding" (ibid.)*

A vulnerability dependence occurs when

*"normative constraints are low, and international rules are not considered binding" (ibid).*

Thus, a country's vulnerability dependence can be significantly different from its sensitivity dependence, and potentially much more costly. The costs of dependency on imports of a commodity can be measured both by increased expenditures, as well as by the effects of changes on societies and governments due to higher prices and/or more difficult access to the commodity. The cost of dependency on exports of a single commodity can in a similar manner be measured by changes in society caused by a sharp drop (for many petroleum exporting countries also even a sharp rise and "Dutch disease" problems, cf. Footnote 31) in prices and/or more difficult access to markets. As dependency on imports and exports is a normal state of economic affairs, government policy should aim to eliminate or reduce (potential) sensitivity and vulnerability dependence, while neutral dependency from this perspective is optimal.

Policy response depends on political will and ability, resource capabilities as well as on the rules of conduct embedded in international regimes (e.g. WTO-regulations, EU-law). The challenge is of both an external and domestic political nature. An importing country can become more sensitive or vulnerable in a given state of dependency if the commodity originates from one powerful state, as opposed to if it is multilaterally dependent. An exporting country can become more sensitive or vulnerable if it depends on only one market, as opposed to many export markets. It is important whether supplying, respectively purchasing, nations are antagonistic or friendly in their relations, in addition to the degree of market power they possess. Foreign policy will consequently be an important external instrument for reducing sensitivity and vulnerability dependence, in addition to influencing degrees of market imperfections that might exist.

What are the intentional and functional linkages between market liberalization and energy security? For a natural gas market liberalization process within the EU, it is only in a situation where the EU is permanently (commercial and political) neutral dependent on imports and the transit of non-renewable resources, or is sufficiently flexible to change to affluent supplies of alternative sources of energy, that international affairs and external market organization is not considered important for its long-term success. However, these conditions are not fulfilled. As natural gas is a non-renewable resource, cf. Chapter 5.4, and with

a limited number of supplying nations and companies dominating external supply, relatively few transit lines and close to all growth in consumption must be imported, it is difficult to see how the EU cannot be sensitive, if not vulnerable in given situations, to changes in supplies and prices. In an extreme and perhaps hypothetical scenario, where most Russian (or even Norwegian) gas disappears from the market, part of EU dependency would be characterized as vulnerable.

More realistically, however, with Russia's more nationally defined petroleum policy in recent years it is not certain that growth in Russian supply and other countries in the "gas ellipse", cf. Figure 4.1, will follow desired growth in imports as defined by the EU. These countries can over time choose to sell gas to the East or to the West, such that Europe and Asia would have to increasingly compete for resources, in order to enhance their own security-of-demand. The long-term risk for European gas-importers is about securing sufficient new supplies to meet demand. This risk is rooted in both external political problems, as well as the non-renewable and scarce nature of the resources.

External market and political situations and relations are important in determining the kind of commercial and political opportunities and challenges faced by EU actors, as well as the intra-EU measures that can be potentially sustainable. The similar picture for exporting countries is that they depend on the EU as the major buyer, largely dominated by a few commercial companies and a gradually stronger coordination of policies at the EU level in energy and natural gas markets. Without proper security-of-demand, large and long-term investments in natural gas production and infrastructure will not be sustainable.

It is important to notice that sensitivity or vulnerability dependence on imports and exports, respectively, may occur even if the physical markets themselves are not considered at all commercial or politically 'risky'. An exogenous shock in international markets - caused by for example war and earthquakes limiting supplies and disrupting pipelines - may dramatically change prices, also in 'secure' markets. In a price shock situation anyone may sell and buy the commodity (unless it comes to an armed conflict with the country itself involved). The problem is that if, for example, oil prices increase dramatically, parts of demand in consuming countries will switch to gas, coal or electricity and

push these prices up, as well. Thus, security-of-supply for a consuming country is influenced by the pure physical access to gas, increased economic costs due to a rise in energy prices, and the political pressure that can be brought on them by parties controlling supply elsewhere. Security-of-demand for an exporting country comprises similarly, the risk of a dramatic price drop, economic loss, and adjustments in the economy caused by the loss of revenues and the risk of being politically pressured by parties controlling markets.

In a situation when security-of-supply and -demand problems cannot be resolved through foreign policy or market reorganization, effects of sharp price changes and/or availability, or market access must be addressed by domestic measures. The ability to domestically adjust to such changes is important in determining the degree of sensitivity/vulnerability in the short and long-term respectively, for both importing and exporting countries. If a country for example, changes from being inelastic (inflexible) in its demand for imports in both the short and long-term; to inelastic in the short and elastic in the long-term, the country's dependence on imports may change from vulnerable to sensitive.

Domestic and external market and political situations together create the character of a dependency on others and to what extent it should be considered or not considered a political problem. Domestic and external measures for dealing with a problem can as a consequence also be (partly) substituted with each other. For example, a problematic one-sided dependence on one natural gas pipeline from a source considered insecure or antagonistic, can for an importing country be reduced to a smaller problem if: a) the supplying (and in some cases the transit) country becomes more amicable and predictable; b) another pipeline is built with gas from another source; c) the importance of the single supply in the overall energy balance is reduced through energy efficiency measures; d) the ability to switch to alternative fuels is improved, or; e) the country has stocks that can be drawn upon to solve a disruption problem, as for example, the Strategic Petroleum Reserves (SPRs) in the oil market. A build-up of Strategic Gas Reserves (SGRs) (cf. Austvik 2004) might be part of the policy seeking to reduce sensitivity to short-term emergency problems. The Security of Gas Supply Directive (EU 2004b) does however not contain measures such as storage, short-term contingency

supply and capacity, because of implacable opposition from companies and governments. These are however dealt with by the individual member countries.

For an exporting country, external measures that improve relations to importing countries and new pipelines to other purchasing countries, similar to points a) and b) for importing countries above, would improve the situation. Domestic measures would entail diversifying the economy in order not to be so dependent on natural gas exports. She could also refrain from using all revenues as they are earned, and instead place them in a fund, as is in the case of Norway, cf. Chapter 2.4, and now also Russia, cf. Chapter 5.3.2, and others. A fund can virtually eliminate short-term domestic economic problems and sensitivity dependence on prices and markets for exporting countries. With a large fund, vulnerability dependence may also be significantly reduced. The dependency issue for exporters will gradually shift focus towards the status and development of the fund itself. While stocks for the importing country would be important for improving short-term supply security, a fund for the exporting country would serve both short and long-term purposes.

Internationalization and global market integration is gradually changing the character of interdependence between market actors for European gas. With an expansion of supplies to Asia, Russia reduces her dependency on EU as the dominant purchaser (Lahn and Paik 2005). Similarly, as the EU diversifies import opportunities towards the Middle East and Central Asia (as in the case of the Nabucco pipeline project), her security-of-supply situation improves. As Norway has started to sell LNG from the Snøhvit field to the U.S. also her dependency on pipeline transportation and the EU as the only purchaser is modified. Gas markets are becoming more global and dependency on single sources and markets is gradually reduced for many actors. The longer these processes develop, bilateral affairs will become less important and the gas market will look more like the oil market, although by no mean the same. The security-of-supply and security-of-demand issues will group around the debate about whether prices are too high or too low, and degrees of price volatility. The development of and convergence between European and global import prices on natural gas is shown in Table 4.1.

### 5.3.2 Long-term production investments under liberalization

Liberalization of the EU gas market contributes to improvement in security-of-supply of gas for consumer countries in the short and medium term through the creation of an open market with lower prices, by splitting existing producers and production into areas with more units, opening access to pipeline transportation and physically building more pipelines and gas storage units. On the other hand, more volatile, uncertain and periodically lower producer prices, as discussed in Chapter 4.4, may lead to a drop in large investment projects, especially in weak market situations, and deteriorate security-of-supply in the long-run. Part of the problem lies in the fact that a long period of time passes from the decision to develop a gas field and the actual start of production. Even if prices are high for a period, it shall pay back over a longer time period when prices again may become very low.

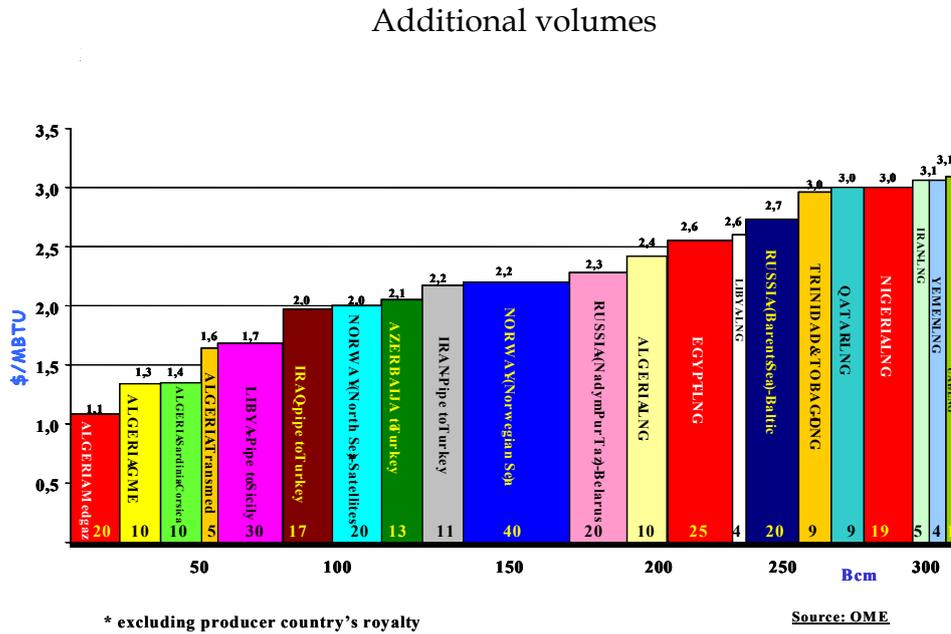
From the outset gas fields are more vulnerable than oil fields in a free market due to long-term infrastructural development needs and the often bi-lateral character of single investments. Fields and transmission solutions which do not show the required yield at a given point in time may be delayed. A delay means reduced supply of gas in the long-term. In this context it is unlikely that short-term contracts will form the foundation for investments in all infrastructure and large development projects for producers in evolving markets. Only in the third stage of a gas market development, cf. Chapter 4.1, short term contracts and increased price uncertainty has the potential to defend such investments. Reduction in long-term supply increases price volatility and, *ceteris paribus*, tends over time to create higher prices for incumbent producers. Clearly consuming countries are well served by low gas prices, and they have no reason to give producers any economic profit. A high growth in gas demand and low prices will be advantageous for consumers in the short and medium term. As more volatility and uncertainty tends to give higher prices in the long-run, consumers' short and long-terms interests are in conflict, cf. Chapter 5.4.

In the third stage of market development, for both buyers and producers market balance is a question of how total supply can be orchestrated over time and across producing nations. Increased supply of gas in the long-run may come

from regions that are already suppliers to the European continent. However, in order for new regions to enter the arena, new pipelines and LNG terminals must be built. This primarily applies to fields remote from the European market (the Barents Sea, Central Asia, and Middle East, Nigeria). At oil prices up to 2002 the natural gas import price at EU's borders was some 2.7 \$/mmbtu, cf. Table 4.1. This price covered the costs of most new production from existing and new suppliers. Three years before however, in 1999, the price of gas was below 2 \$/mmbtu and excluded many of the projects from being realized. Later, higher oil prices and a tight gas market have lifted gas prices such that, if sustained, they would cover the costs of all projects listed. In 2007 the import price of gas to the EU reached almost 9 \$/mmbtu.

Figure 5.2 illustrates a long-run marginal cost curve for gas to the European gas market. The costs illustrated can obviously be further analyzed and discussed, but the point argued is that lower and unstable prices stemming from a more liberal market advantageous to consumers in the short-term, may cause problems for the supply of gas in the long-term. Large investments in a liberalized market depend on a *continued* tight balance between demand and supply, as opposed to long-term planning in the "old" market. When a project is to be amortized over 20-50 years, producers do not know what the balance will be between supply and demand. Even if prices today are high, they may well drop significantly within the amortization period.

Figure 5.2: Gas supply cost curve for EU-15 to 2020



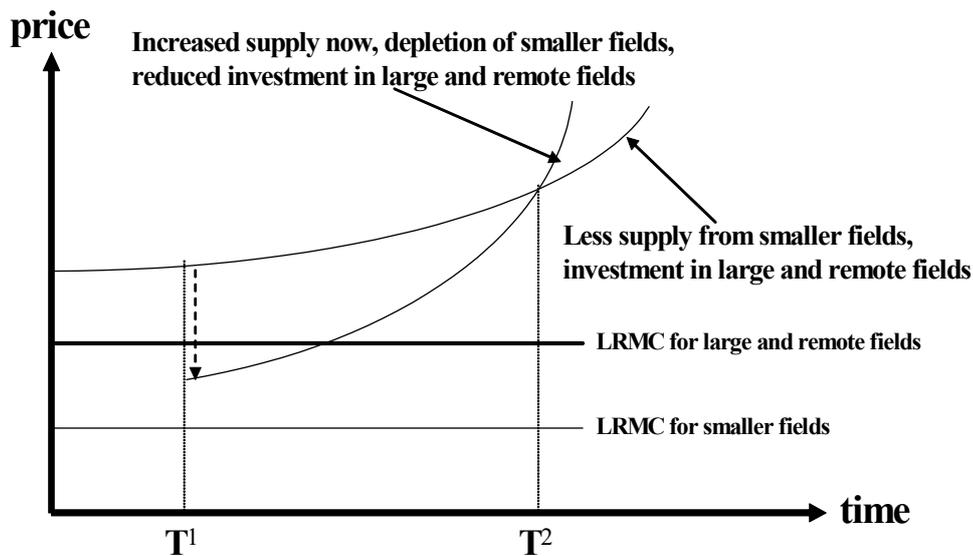
Source: OME 2002

Thus, supply of gas from large new supplier countries may be delayed through liberalization, as well as the development of large new fields from existing supplies, if the general level of energy prices declines to levels before 2002. Cheap substitutes may enter the market and other forces and factors may potentially also lead prices to decline, cf. Chapter 5.4.3, as seen from the investor's point of view.

Figure 5.3 illustrates a situation where there is gas that could be sold on to the market if permitted due to market liberalization: producer prices are dropping at time T<sup>1</sup> as natural gas previously "locked out" from the market is released, market flexibility improved and an over-supply is created, cf. the U.S. experiences discussed in Chapter 4.4-5 and 5.5.6.1. A situation emerges whereby the price drops below long-run marginal costs (LRMC), including a risk premium for large and remote fields (assumed higher than LRMC for smaller fields, although this may not always be the case). The lower prices lead to higher consumption and the absorption of existing capacity at the same time as smaller and marginal fields will be more easily developed. As the price will be lower than the cost of developing large and remote fields, new supplies from these fields will not be realized in the first years after liberalization. Lower and more volatile prices lead to a time lag in investment

decisions compared with requirements to meet demand.<sup>63</sup> In the long-run, at time  $T^2$ , prices become higher than if prices had not dropped at  $T^1$ . This parallels the short and long-term effects of introducing competition in a monopolized market for a non-renewable resource, cf. Figure 5.7.

Figure 5.3: Price paths for European gas with high and low depletion rates



*Illustrated LRMC for large and smaller fields (assumed constant).*

Volatile, uncertain and periodically lower producer prices may lead to a drop in the number of large investment projects under liberalization. This is especially important in weak market situations, as was the case when the U.S. and U.K. gas markets were deregulated / liberalized. Therefore, market reform and liberalization should be introduced in a way that ensures that prices will be stable over time, in order to give supply a chance to grow in line with demand, especially in those segments where the market is still considered immature. In this way security of supply is *de facto* improved also in the long-term.

<sup>63</sup> Midttun, Johnsen and Finon (2004) discuss the same type of effects on long-term investments in the Nordic electricity market.

*“Regulatory frameworks should reflect market realities, i.e. prevailing market structures and market functioning as well as policy objectives that can all vary across countries and regions. Developing markets need different and a more “managed” regulated framework compared to mature markets” (Correljé, van der Linde, Tönjes and de Jong 2006:47).*

When a liberalized market becomes tight and prices high (as of yet) new investments in relevant large new project will not necessarily be made fast enough to meet demand growth. The investor is up to the risk that the high prices may lead to strong reactions among consumers and companies, and that over time growth in natural gas demand will decline, cf. Chapter 5.4.3. The development will be more of a stop-and-go kind and reduce growth in long-term supply of gas, as compared to an alternatively more “managed” market. However, when the market is more or less fully developed (in its third stage, cf. Chapter 4.1), a full liberalization is more attractive for most participants, as it is then a question of market efficiency, flexibility and cost reductions. In such situations competition can more easily *de facto* be encouraged by efficient regulations and new market design.

### **5.3.3 Norway and Russia as dominant suppliers**

Since the 1970s, Norway and Russia has shared the top two positions as natural gas exporters to the EU. Russia is however the dominant energy supplier to Europe. The development of the EU gas market depends heavily on Russian energy policy and developments. After years of production decline during the transition period following the Soviet breakup, a significant recovery in Russian oil production has taken place. In 2007, it reached some 10 mbd, of which 7 mbd was exported (EIA 2008). This made the Russians the second largest exporter of oil in the world after Saudi Arabia. Oil reserve figures indicate that Russia can be one of the world’s key oil producers for at least the next 40 years. Reserves of Russian natural gas are even more abundant than oil and it is estimated that they will be available for the next 100 years at current production levels. With almost no decline after the Soviet breakup, Russia produced almost 700 BCM of natural gas in 2007 (7-8 times more than Norway). Production is projected to increase further in the coming years (ibid.).

Russia is the world's largest producer and exporter of natural gas, making the country the major single combined oil and gas producing country in the world (larger than Saudi Arabia), and is emerging as the world "energy superpower" (Smith 2006). The Ukrainian gas dispute that reached a preliminary climax in January 2006 and a similar conflict with the Byelorussians over oil in 2007, added to the Russian feeling that they are politically and economically locked in. Russia needs foreseeable terms of trade and transit with the CIS countries. Russia also needs more alternative transportation routes. The dependency on petroleum exports for foreign currency earnings make these issues a top Russian political priority.

As Russia moves (slowly) towards a market economy and integration in the EU and world economy, she is converging with Norwegian petroleum policies in some areas (Austvik and Tsygankova 2004). Even though Russia has no EEA agreement with the EU, as is the case with Norway, she is integrated into EU energy markets (although not in such a one-sided manner as Norway), and is influenced in similar ways as Norway by downstream market changes and policy interventions by the EU and EU member countries, such as market regulation and taxation. As Russian gas policy is not "domestified" within the EU, she has however been able to arrange her petroleum industry in a rather independent manner.

As a result, Gazprom has not been forced to unbundle its activities, and has instead strengthened its position over the past years as a producer and transporter of gas within Russia.<sup>64</sup> The government has also strengthened its direct control of Gazprom; the links between Kremlin and the company are tight. New Russian president Dmitri Medvedev actually comes from the position as chairman of Gazprom, besides having been vice Prime Minister of the Federation. Abroad, Gazprom still wants to sell her gas before a field is developed (Miller 2006), as was the way of contracting before the EU started her market liberalization efforts. Actually, the structure of the Russian gas industry and the logic of its organization haven't changed much since Soviet times.

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<sup>64</sup> See Stern (2005) for a comprehensive discussion of Gazprom positions and developments.

In the oil industry, the situation is different. Former president Putin's fight to "bring order" after the Yeltsin era and the privatization of the oil companies in the 1990s, have resulted in a struggle to increase the state's control over the industry and capture rent for the state. While there is still some struggle over authority between the government and the oil companies, there is less political interest in changing the non-competitive structure of the natural gas industry. Any heavy involvement of international oil companies will take time, although the need is increasingly apparent. So far foreign companies' participation in the Russian oil and gas sector has been very limited. The German-Russian consortium to build the Baltic Nordstream gas pipeline, and the invitation to StatoilHydro and Total to develop the Shtokman field, may be signals from the Russians that from a capital and technological perspective a greater involvement of foreign companies are desired.

The fact that Russia is not fully integrated in the international economy, as for example in terms of membership in the WTO, has had a certain negative impacts. Relatively low competitiveness of Russian products and a number of out-dated production technologies developed during the Soviet era are still in operation, giving her a technological disadvantage.<sup>65</sup> On the other hand, free trade allowing the import of competitive technology to Norway, as a full member of the international trade system, has contributed to the development of the high-tech Norwegian petroleum industry.

In order to reduce Russian economy's dependence on oil and gas export revenues, Russia turned to the idea of creating a Stabilization Fund, similar to the Norwegian Petroleum Fund. In 2004, Russian federal budgets allocated the first money to this fund. The fund is to supply financial provisions to the federal budget when oil prices eventually drop. Federal budget revenues, with oil prices higher than a certain base price, are accumulated in the fund (Legislation Collection of Russian Federation 2003). The main sources for the fund are

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<sup>65</sup> On the other hand, Russian entry into the WTO will require an increase in domestic oil and gas prices in accordance with world energy prices. As long as there is such high energy intensity in the Russian economy, the competitiveness of her products in both international and domestic markets may deteriorate as a WTO member in the short and medium term. Russian governments have been cautious with respect to changing domestic energy policy.

elements of government revenues from petroleum export duties and taxes on petroleum due to international oil prices above a base price. The Ministry of Finance in the Russian Federation manages the fund and the government decides on its use.

In contrast to small-state Norway, the Soviets made petroleum policy an important instrument for geo-political influence. In maintaining a leading position in East-West relations, oil and gas resources played a significant role, along with military strength (Hewett 1984). The crucial differences in the size of the two countries and their geographical positions, and not least, their culture and history, create also today rather different positions for foreign policy. Norway, as a small country, has relatively little influence in the world community. Russia with its vast territory located in the "middle of the world" and with its enormous natural resource reserves, will inevitably profit from combining economic as well as geo-political goals (as in the Soviet era). Hence, the Russians from a power perspective are more easily placed than Norway to play with the EU, its member countries and the U.S.

As in Soviet times, the exports of oil and gas have become an important factor in the determination of Russian policy. In the Soviet era oil and gas was emphasized as part of a strategy for geopolitical dominance. For Russia revenue aspects are now a dominant priority. Policy supporting production and a growth in exports is however, grounded in both of these reasons. The Soviet legacy still influences many aspects of energy policy formation in Russia. Internally this is reflected for example in domestic energy prices that are relatively far from international prices, and in many cases non-payments for gas services is normal (Tsygankova 2008).

Besides some convergence between Norwegian and Russian energy-related policies, the development of offshore fields in the Barents Sea means that the two share an interest in the development of infrastructure and industrial technology. Given cooperation, Norway will need alliances and partnerships with non-Russian parties in dealing with her greater energy superpower neighbor, as when a "mouse goes to bed with a bear". Such cooperation will be especially

challenging if cooperation is to take place within a disputed area, as long as the dispute is unsettled (Austvik 2006).

For Russian developments in the Barents Sea it is important to note that it is only one of several options in their desire to increase (oil and) gas production. Even more abundant resources are located in Western Siberia, mostly onshore. Many fields are also located in Eastern Siberia and can serve Chinese and other Asian markets in the not so distant future. With the anticipated lower cost of these fields, their relative proximity to fast growing energy markets in the East, as well as the Russians' long expertise in mastering land based gas projects without the help of foreign companies (although often inefficient), it is not certain that they will choose to develop Barents Sea gas (and serve the EU) as their priority. Although Gazprom expresses a desire to expand in several markets simultaneously, and is planning extensive field and infrastructural developments, the Russian company may run risk of an "imperial overstretch" as the world energy superpower. The decision so far not to include foreign companies as part owners in the Shtokman field, but only as developers, may also contribute to delays in these types of developments.

When Russia starts to export gas to Asia, an Eurasian gas market will evolve, linked through Siberian pipelines. A proposal to form a "gas-OPEC" consisting of Russia and other countries in the "gas ellipse", cf. Chapter 4.1, was proposed in 2007 (cf. Stern 2007). This would change the dominant position of the EU as the most important buyer of Russian gas, and put Russia in an even stronger position as a world energy exporter. Thus, for economic growth to continue as anticipated, Europe and the world are not only dependent on the continuous flow of oil from the Persian Gulf. Russian gas may become as important, for both Europe and Asia. With a faster depletion of Norwegian and other politically "safe" sources, European dependency on Russian gas will increase over time. As energy markets are interlinked, a tight market situation in natural gas will increasingly exhibit spillover effects into the oil market, and not only the other way around. With gas consumption rising rapidly in Europe and in the rest of the world, a Siberian crisis in 20 years time may have the same fundamental effect on the world economy as an oil crisis in the Persian Gulf.

In sum, the interdependence between the EU and supplying nations (and especially Russia) with respect to natural gas can never be of a completely neutral kind. The security-of-supply situation for European gas can actually be improved in the long-term if competition is not introduced among suppliers, and especially within Russia. Competition in and privatization of Russian gas activities would improve the European supply situation in the short-run, but could lead to deterioration in the long-run. Prices could be pushed down, resources exhausted more quickly (and inefficiently) and a greater dependence on Russian gas would result at a later point in time.

At the same time, the Norwegian-Russian relations in the energy field also become of interest to the EU, as Norway potentially might influence Russia's investment decisions in the High North, and contribute directly to the improvement of her technological, environmental and commercial standards. In part, the Russian gas sector can be considered not yet to have reached the third stage of development, and bilateral arrangements on both political and commercial levels are necessary to realize significant projects (cf. the Nordstream project as an example). Russia becomes more important to Norway as the EU gas market becomes more open, but Norway may also become more important to EU energy interests, alongside the role of her own natural gas resources, if an extensive cooperation with the Russians is developed.

#### **5.3.4 Norwegian – Russian market considerations and the EU**

A political awareness of joint interests in market developments, prices and contractual terms between Norway and Russia only became stronger in the 1990s. Norway and Russia have competed in energy markets since the 1970s, but their adherence to opposite economic and political poles oriented exports to a large extent to different markets. Norwegian oil and gas was almost entirely directed to Western European countries (and some oil was exported to the U.S.), while more than half of Soviet exports were directed to Eastern Europe and the Soviet Republics. After the break-up, Russia has notably increased its exports to Western Europe.

With an increasingly more open EU gas market, the overall balance between supply and demand for gas becomes import for market outcome. Member countries

of OPEC possess a combination of common and conflicting interests corresponding with those of Norway and Russia in the EU gas market. Every OPEC member has a common interest with the other OPEC members in seeking the common good i.e. that the price of oil in the global oil market is reasonably high and stable, in particular in what is considered weak market situations. The countries have however conflicting interests when it comes to who shall pay for keeping the price high. This can be seen in the continuous discussions about production and quota distributions within OPEC, particularly in periods where demand for OPEC oil is low. All OPEC countries desire that other member countries should reduce their production, so that they can be left to themselves and act as "free-riders".

As a part of a comprehensive strategy, gas exporters may also in future given situations have good reasons for playing together to influence price stability and development. Russia sees long-term contracts as the logical way of establish long-term confidence between parties who need confidence in supply and confidence for irreversible pipeline investments.

*"Energy security of the region requires the long-term contracts to be the foundation of the European gas market allowing fair risk distribution and adequate contribution from both sides" (Medvedev 2006).*

However, even though Russia is not affected directly by EU gas regulations in the way that she organizes her industry, she will meet the same uncertainty as Norway in terms of prices. More short-term contracts and the political risk that gas taxes *ex post* may suppress EU import prices (Norway's and Russia's export prices) contribute to this uncertainty. This could hamper investments in large and remote new production fields and in transportation infrastructure in Russia, as well as in Norway.

In this situation, producers can play an important role in achieving the joint interest in maintaining stable and foreseeable supplies to the European gas market. In order to do this, producers need stable and foreseeable prices. Long-term stabilizing actions should not come in conflict with consumer country interests, unless the prices are higher than the LRMC for fields supplying the market. Such higher prices on the other hand, include conflicting interests between buyers and sellers.

*“In fact, liberalization primarily promotes active development of the gas market and enhancement of competition, creating better conditions for customers while providing access to the gas market for new producers. At the same time, liberalization of the gas market has to support balance of interests between producing and consuming countries, because the balance has an impact on the stability and reliability of gas supply and, in the last analysis, determines the energy security of the country.” .. “Russian scientists believe it would be timely and necessary for a comprehensive Agreement to be concluded by and among gas producers and consumers, to provide for sustainable development of the European gas market and for the energy security” (Dmitrievsky 2003).*

At the same time, Russians have used the opportunity to invest downstream in the market, giving rise to the fear that they will gradually control too much of the gas industry (Locatelli 2007). Bolle and Ruban (2007) argue however that Russian participation in the downstream market would decrease consumer prices and increase the security of supply. The map in Figure 5.4 shows main Russian dominated oil and gas pipelines to and inside the EU.

Figure 5.4: Map: Primary Russian Oil and Gas Pipelines to Europe



Source: EIA 2007

One problem for Norway is that Russian gas may over-supply the market if liberalized. This is assuming that Russian gas companies other than Gazprom obtain the right and possibility (including access to domestic transportation) to sell gas abroad. The price they will get is higher in the EU than in the Russian market. Russian gas companies will, naturally, try to sell where prices are highest. Better access and higher prices will lead to a lot of gas being offered to Western markets and less gas being sold to the domestic market, and thus, creating an oversupply in the market (a "gas bubble", Stern 1995). In this way, each company's logical action will lead to a drop in price in the European market (the common good/evil) for everyone. The American gas bubble in the 1980s was similarly created as a result of the deregulation of the US gas market, cf. Chapter 5.5.6. In this way, domestic Russian energy developments are of Norwegian concern.

In the energy dialogue between EU and Russia (Aalto 2007) there seems to be a growing recognition on the EU-side that long-term contracts may be beneficial and that joint negotiations may be necessary for parties who will develop large gas field and transmission systems. It seems that it may be possible to live with the destination clauses in existing gas contracts, and that one may find solutions to this issue in the case of new contracts that may follow. But, it has taken a long time to arrive at these simple understandings, in a period of an historic Russian move to the west. Perhaps, without the events of September 11 2001, parties would still not have sufficiently recognized the importance of such long-term planning, in interaction with liberal market initiatives in the energy industry. The experiences from the chosen mixture between politics and markets developed by the Norwegian petroleum enterprise since the 1970s, cf. Chapter 2, is an illustration of the need for an active state policy in interaction with market mechanism and actors, to achieve desired results in this sector. State policy and plan economy (as in Soviet times) or markets actors and transactions alone, will easily lead to sub-optimal results as compared to a well thought mixture between the two.

As a major natural gas exporter, Norway has in some areas developed divergent interests relative to importing countries which otherwise are close to her (such as the EU and EU countries), economically, as well as politically. Norway also shares interests with other petroleum exporting countries. These countries are in most cases quite different from Norway in general economic and political affairs. In the field of natural gas the most important country for Norway is Russia. Thus, Norway's role as a major petroleum exporter has long been relevant, not only for the industry and the economy, but also for her diplomacy, including security and defense policies. For the political entrepreneurship this makes it necessary to develop enhanced diplomatic and economic relations with the Russians. Market liberalization, and the common interests between the neighboring producers that it creates, is part of the reason. It is however necessary for Norway to balance foreign and security policy with EU countries (and the U.S.), in order to secure her relations with Russians not to involve more aspects of the relationship that she desires; the significant other differences in terms of geopolitical role, culture and history, between the two countries remain.

## **5.4 Constraints from the non-renewable nature of natural gas supplies**

The third constraint to be discussed that obstructs a straight-forward liberalization of the EU gas market is the non-renewable nature of natural gas. (Oil and) natural gas differs as non-renewable resources from renewable resources in that their supply is limited to a relatively few places in the world. As resources are exploited, remaining reserves are reduced. What is extracted today cannot be extracted tomorrow. The rationing of scarce resources takes place partly through pricing mechanisms. Economic theory of exhaustible resources assumes that consumers will have to pay a higher price than marginal production costs.<sup>66</sup> Most producers of (oil and) gas, and not just the cheapest, have therefore mostly, albeit not always, earned an economic rent. In petroleum producing countries it has been a prevailing opinion that a resource rent should be earned by petroleum producers due to the commodities' non-renewable nature.

Salehi-Isfahani (1995) lists however, research on rent distribution in markets for exhaustibles according to two categories: those who believe in rising prices due to resource scarcity and those who believe they will rise due to market power on the supply side. While this sub-chapter mainly deals with the effect of resource scarcity, the second category of research points to an international and imperfect market logic influencing rent distribution, as discussed in Chapter 5.3. In the oil market, producer cooperation and wars in the Middle East after 1973 led to a situation in which much rent accrued to producer countries. The second oil crisis in 1979/80 reinforced this trend. Before 1973, international oil companies gained the most, and also consumers in part through a large consumer surplus. After the drop in oil prices in 1986, rent went to the treasuries of consumer countries through taxation (particularly in Europe), or again to consumers (as in the USA), cf. Chapter 4.7. With higher oil prices after 2001, concerns with market power and political pressure from petroleum producing states reemerged in the West. In the case of Europe this especially concerned natural gas and the emergence of Russia as an “energy superpower”.

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<sup>66</sup> The terms exhaustible and non-renewable resources are here used interchangeably.

Nobody can however claim to have found the right understanding of the behavior of markets for non-renewable resources. Most approaches have shown a rather weak record when confronted with the ability to foresee future price and output developments, as shown in Lynch (1992). The perception of how future prices will develop seems heavily influenced by the situation at any point in time (extrapolation of trends from the immediate past). Furthermore, what is a “reasonable and fair” distribution of rent seems to be heavily colored by the interests of individual actors.

Even though producing countries may consider it logical and reasonable that they should earn more than normal profit on their petroleum activities, this view is not necessarily shared by consuming countries. Positioned as consuming nations, the view and policy goal should be that producers need no rent to produce (only normal profit corrected for risk), and that consumers should instead receive most of the benefit through lower prices, or their home treasuries through taxation of their own consumers. Consuming nations do not see the necessity or reason that producers should get the rent, from a scarcity or political point of view.

Adelman (1989) has provided analytical support for this view, arguing that economic and technological developments would lead to a decline in petroleum prices over time, cf. Figure 5.8; More resources will be found, and technological changes will be introduced in production, transportation and consumption, and together with substitutes they will limit petroleum prices. Even if the resources are exhaustible in geological terms, and limited periodically due to political, technological or infrastructural constraints, they need not be so in economic terms in the long-run, according to Adelman.

It is consequently debated whether non-renewable petroleum resources should be considered scarce or abundant in economic terms in the long-run. A “Limits to Growth” way of thinking (Meadows, Meadows, Randers and Behrens III 1972) as an example of neo-Malthusian theory (Malthus 1798) claims that scarcity is obvious. So do peak-oil enthusiasts (Deffeyes 2002, Goodstein 2005). Odell (2004) on the other hand, maintains that carbon fuels will dominate the global energy economy at least in the 21<sup>st</sup> century, in spite of their exhaustible character.

Resources are at least however, scarce in periods, even if the scarcity eventually turns out to be temporal in a longer time perspective. Whether the scarcity problem turns out to be a short or long-term problem for consuming nations, cf. Chapter 5.3.1, it should be addressed politically in a liberalization process, if energy markets are to be stabilized. The understanding of the characteristics of non-renewable resources should accordingly be important for defining maneuvering room and policy options for the EU, with respect to the understanding of potential shortcomings in EU policy, as well as for the maneuvering room for the natural gas political entrepreneur as resource owner.

#### 5.4.1 Scarcity and inter-temporal decisions

Economic theory is probably the most widely applied approach for the analysis of the understanding of price and extraction paths for exhaustible resources (Dasgupta and Heal 1979, Hartwick and Olewiler 1986, Fisher 1981, Mendelsohn and Swierzbinsky 1989, Pearce and Turner 1990, Pindyck 1978, Tietenberg 1998). It differs importantly from the economic theory of other goods, as it explicitly emphasizes the perspective of *time*. For 'normal' goods, marginal costs consist only of the physical costs of labor, capital and input materials. For an exhaustible resource, however, consumption today precludes consumption of the same unit tomorrow. The cost the producer of today imposes on the future, results, in addition, in an opportunity cost (the value of a foregone action). When resources are scarce, greater current use diminishes future opportunities. Thus, a liberalization process that optimizes only a present situation may have significantly other results later on.

The present value (PV) of the foregone opportunities at the margin is called the marginal user cost. This is opposed to marginal extraction costs; a pure technical economic criteria for the production of all goods. Thus, total marginal cost for an exhaustible resource ( $B$ ) is the sum of the marginal extraction cost ( $b$ ) and the marginal user cost ( $u$ ). At time  $t$  this can be expressed as:

$$(i) B_t = b_t + u_t \quad (t = 1, 2, \dots, n)$$

The user cost, also called the *scarcity rent*, is a particular payment for the resource because it is exhaustible. Since  $u_t$  is the opportunity value of selling the last unit in

period  $t$  rather than today, the producer should choose to produce at the point in time when the user cost is the highest. If user costs are the same, the condition to be indifferent between producing now, in period 0 (zero), and in the future is:

$$(ii) u_0 = u_1 = \dots = u_n$$

The producer must, however, take into consideration today's value of tomorrow's money. In fact, he could alternatively produce today, invest the money in something else, and earn the interest this money would yield. Therefore, he has to discount future user costs at an appropriate discount rate ( $r$ ). Taking the discount rate into consideration, his indifference-equation can be written as.

$$(iii)^{67} u_0 = u_t * e^{-rt}$$

If  $u_0 < u_t$ , the producer could improve wealth by postponing production until sometimes later. The discounted value of his production at time  $t$  would be larger than the value of today's production. Vice versa, if  $u_0 > u_t$ , he should instead produce today. The extra price the resource owner obtains in the future should at least be as large as what a chosen interest rate would yield on today's production.

If marginal extraction cost is increasing over time (marginal cost (MC)- curve sloping upwards), the scarcity rent diminishes and the sacrifice made by future generations diminishes. The net benefits that would be received by a future generation if a unit of the resource were saved for them become smaller as the marginal extraction costs of that resource become larger. With increasing marginal extraction costs it will be the difference between the price [ $p_t$ ] and the per unit extraction cost [ $b_t$ ] that must raise with the rate of interest:

$$(iv) p_0 - b_0 = [p_t - b_t] * e^{-rt}$$

This is a more generalized way of describing the price path that makes the producer indifferent when to produce. Obviously, higher extraction costs can be compensated by higher prices and vice versa. The main point is that by moving production between periods the resource owner can maximize wealth. The discounted value of the marginal user cost for the last unit produced in any time

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<sup>67</sup>  $e$  is the irrational number 2.718..

period should equal the marginal user cost in any other period, in order for the producer to be indifferent when to produce.

The type of optimization problem faced can formally be illustrated in the following manner: The owner of the resource wish to maximize the net present value (or net profit) of the resource stock from today until infinity. At time  $t$ , his profit  $\Pi_t$  from production  $q_t$  can be expressed as:

$$(v) \quad \Pi_t = p_t(q_t) * q_t - b_t * q_t$$

The producer's price is described as a function of  $q$  for it to cover both competitive and monopoly firms. The producer's objective will be to allocate production ( $q$ ) between periods in a way that the net present value of the profit is maximized. He will reach that optimum when the integral of the discounted profit-function is maximized ( $T$  being the living age of the resource):

$$(vi) \quad \int_0^T \Pi_t * e^{-rt} dt$$

Doing this, however, he is subjected to the fact that each extraction reduces remaining reserves ( $Q_t$ ) equivalently;

$$(vii)^{68} \quad q_t = -\dot{Q}_t$$

Thus, if initial reserves are  $Q_0$ , then the accumulated output cannot exceed this limit  $\sum_{t=1}^n q_t \leq Q_0$ . Obviously, the reserves at time  $T$ , when resources are fully exploited, cannot be negative. The producer is also subjected not to put any previously produced resource back into the reservoir:  $q_t \geq 0$ .

Optimal control theory can be used to solve this type of dynamic problem. Optimal control methods are techniques that enable us to maximize a function that is subjected to a set of dynamic conditions expressed as differential equations. Equivalent to the Lagrange multiplier in the non-dynamic case, a Hamiltonian multiplier can be used in the dynamic case. Hamiltonians ( $h$ ) can be thought of as shadow prices. Shadow prices represent the opportunity cost of producing a

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<sup>68</sup> · denotes the time derivative of the variable.

commodity not traded. In fact, they express the external cost that extraction of the resource brings upon future generations, or the user cost in our terminology.<sup>69</sup> When (iv) is maximized subjected to (v), the Hamiltonian function can be expressed as:

$$(viii) \quad H(p(q), t, q) = \Pi_t * e^{-rt} + h(-q_t)$$

The 1. order condition will be:

$$(ix) \quad \frac{dH}{dq} = \frac{d\Pi_t}{dq_t} * e^{-rt} - h = (MR - b) * e^{-rt} - h = 0 \quad 70$$

$$\Rightarrow \quad (x) \quad MR = b + h * e^{rt}$$

This result is quite similar to the one in our discussion, as expressed through equation (i) and (iii), where the user cost is the equivalent to the Hamiltonian multiplier. Equation (x) simply expresses that, for a wealth-maximizing producer, marginal revenue should equal total marginal cost ( $MR=B$ ). With the constraint that he is producing a non-renewable resource, he should however not only consider the technical marginal cost of production, but also the user cost he brings upon future generations. Thus, at optimum, he should choose a production profile that satisfies:

$$(xi) \quad MR_t = b + u_0 * e^{rt}$$

This is the general condition, both for a monopoly and for a price taker. Under competition marginal revenue equals price ( $p_t = MR_t$ ):

$$(xii) \quad p_t = b + u_0 * e^{rt}$$

This condition is called the *Hotelling rule* (after Hotelling 1931), expressing that the (net) price of an exhaustible resource should rise at the rate  $r$  in order to make the producer indifferent as to when to produce. The rate of capital gains enjoyed by exploiting the resource must equal the rate of return earned in holding any other asset (e.g. the interest rate). Thus, in the most simplistic competitive case, where price equals marginal costs and extraction costs are assumed constant, the Hotelling rule can be expressed as the rate of price increase that equals the interest rate:

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<sup>69</sup> For an introduction to the use of control theory, see for example Brock (1988).

$$(xiii) \quad \dot{p}/p = r$$

Equivalently, for a monopolist that exploits the inelasticity of demand, the rate of increase in marginal revenue will equal the interest rate.

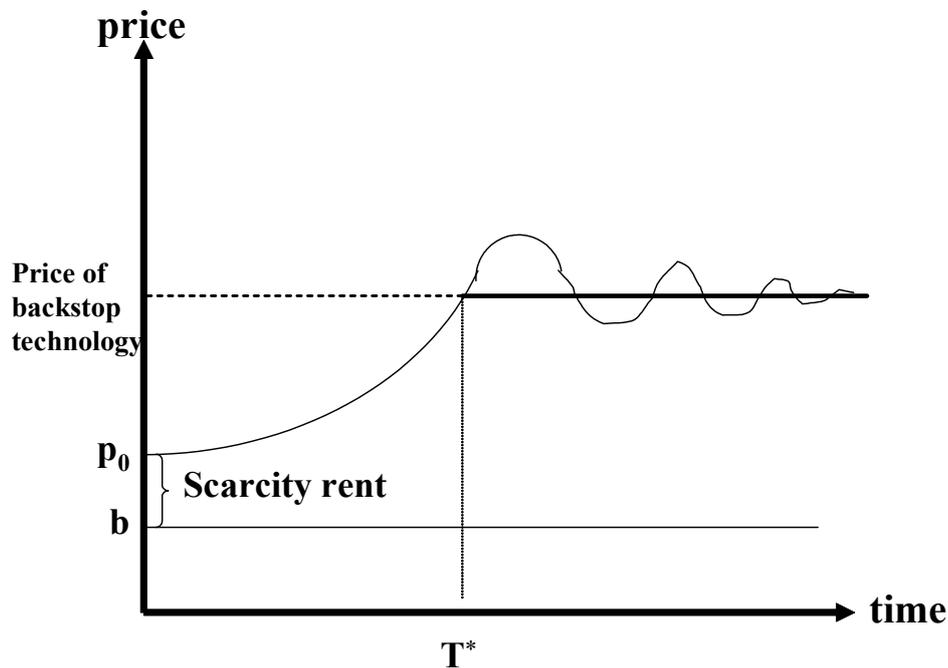
$$(xiv) \quad \dot{MR}/MR = r$$

If net prices (or marginal revenues) increases with the rate of interest, the producer will have the same present value of profits in all periods, and the same present value of the user cost. The producer will be indifferent towards keeping the reserves in the ground or exploring for it and selling it. Also, in order to be indifferent to buying the rights to explore the resource or not, net prices have to rise with the rate of interest to make the investment as profitable as other investments. If net prices shall follow an exponential path, either the price itself has to rise and/or the cost of production must fall. With simplified assumptions of zero extraction costs (as i.e. in Gray 1914), the price must increase with the rate of interest. The rise in the marginal user cost (scarcity rent) reflects increasing scarcity and the accompanying rise in the opportunity cost of current consumption.

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<sup>70</sup> Setting the derivative of  $\Pi$  with respect to  $q$  equal to zero tells us that profit maximum is reached when marginal revenue equal marginal costs. If the producer is a price taker MR equals price, e.g. price will equal unit cost.

Figure 5.5: Price path with a backstop technology



If prices rise so much that they reach consumers' maximum willingness to pay (WTP), consumers will stop using the resource.<sup>71</sup> Thus, if there exists a substitute at a price lower than consumers' WTP, extraction will be pushed forward in time and stop earlier than if no substitute product existed. Prices may increase up to the point that it reaches the price of the backstop technology. A backstop product is a known technology that can serve as a substitute for a product or a resource. The substitute can set the upper limit of the price of the resource. The price profile in a competitive market with a backstop technology is shown in Figure 5.5.

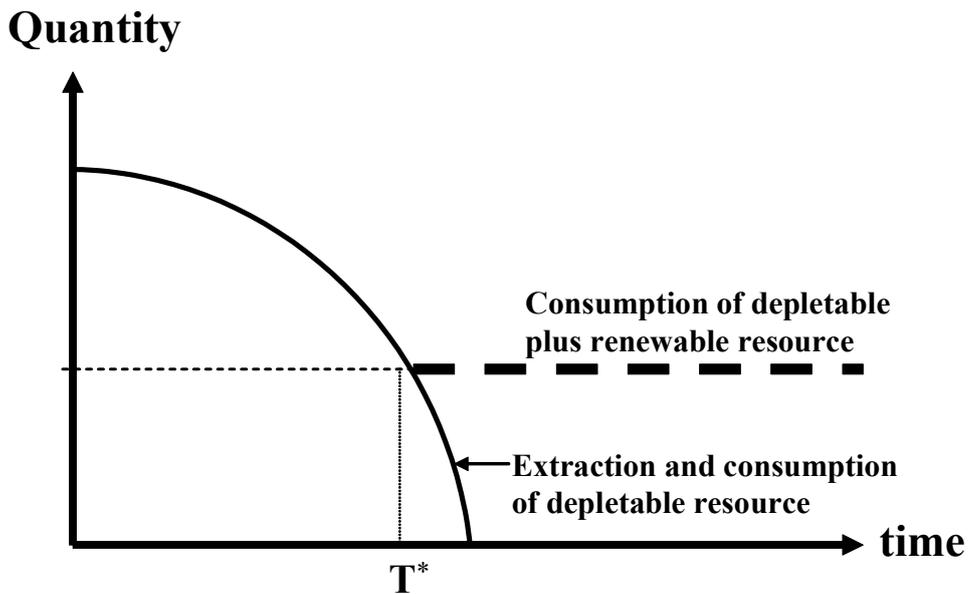
The model tells us, with the modifications mentioned, that prices would rise until they reach the price of the backstop fuel. At this price, unlimited supplies of the backstop product are made available and the price of the resource will be the same as the price of the substitute. If it takes time to introduce the backstop-fuels

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<sup>71</sup> Willingness to pay is the valuation placed by an individual on a good or service in terms of money. It can be expressed by the inverse demand function:  $Q = f(p) \Rightarrow p = g(Q)$ . Total willingness to pay is the entire area under the demand curve. WTP is otherwise the same as consumer surplus. Maximum WTP is represented by the price so high that all demand is abolished.

(e.g. for technical reasons) the price may pass the backstop price for a while, until sufficient amounts of the alternative fuel(s) have reached the market. An intriguing question is consequently what is the backstop price, as it will only be observed some time *after* it is passed by the price of the exhaustible, and in the next period be higher than this price before it becomes the reference level for the exhaustible price.

Figure 5.6: Production profile for an exhaustible resource



The production profile for an exhaustible resource with a backstop technology is presented in Figure 5.6. The profile illustrates that the extraction of a non-renewable resource will decrease over time (if the demand curve is stable). This is due to the fact that marginal user costs (or scarcity rents) increase over time. The bowed curve is somewhat steeper than if there were no substitute. When the price of the resource reaches the choke price (price of the substitute or the backstop price) consumption of the substitute will start and the extraction of the resource will fall rather rapidly.

Obviously, the size of the user cost will vary with future supply and demand. Therefore, today's perceptions of the future will be of significant importance in its determination. If supply is sufficiently abundant in the foreseeable future (relative to demand), production today may practically not preclude production tomorrow. If the producer expects higher prices in the long-run, he may restrict supply today in

order to sell it at a later point in time. Equivalently, with low discount rates, the growth in the price has to be less than when discount rates are high, in order to make it profitable to delay production.

Obviously, how to deal with *uncertainty* in the assumption of the future development of a number of factors is a major problem in determining user costs. When uncertainty increases, discount rates become higher and production is pushed ahead in time. Uncertainty, in and by itself, shortens the depletion horizon, and gives a steeper price path. Each of the factors we have discussed above involves uncertainties. In addition, there is uncertainty concerning the interaction between them. For example, how will a more elastic demand reduce prices and how will low prices influence growth rates and, subsequently, increase prices?

Analysts have extended Hotelling's model to discuss how uncertainty affects production decisions and price paths. Dasgupta and Heal (1974) consider the role of uncertainty about production techniques of backstop fuels. Dasgupta and Stiglitz (1981a, 1981b) discuss resource depletion under technological and market uncertainty, respectively. Hoel (1978, 1980) studies substitute resources, assuming that there is knowledge about the time the substitute is available but not about its costs. Stultz-Karim and Economides (1989) examine the effect of uncertainty in ultimately recoverable oil reserves and its effect on price paths.

Very simply the producer can, for example, assume that today's population is more important than tomorrow's and choose a high discount rate and produce more today. However, if he considers all generations of equal importance, he resides with the problem to determine all other factors influencing the price path.<sup>72</sup> Thus, being a rational wealth-maximizing producer, there are many possible productions and pricing paths depending on assumptions made. Particularly there is a problem for decision-making that the market interest rate (for example from a deposit in a bank) is relatively more easily observable than future prices of a commodity. A bank deposit is also more easily shifted from one type of investment to another; cf. the investments done in the Norwegian Petroleum Fund. The owner of an exhaustible resource often has large fixed costs and may have long-term contracts that make it

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<sup>72</sup> Hartwick (1977), Aarrestad (1979) and Solow (1986) are among those who have studied intergenerational allocation of rent from natural resource extraction.

impossible for him to shift to some other type of investment. Transaction rigidities therefore indicate that the Hotelling rule should only have an explanatory power for the market of exhaustibles in the long-run, when rigidities in production and short and medium term demand inelasticity have time to adjust.

#### **5.4.2 Competition among producers and security-of-supply**

Competition is generally seen as a prerequisite for markets to work efficiently. Competition lowers costs and improves the quality of products and services. That is true when there is free entry to and exit from the market. If there is not free entry and exit some degree of market power resides with one or more actors. This market power could be reduced or eliminated by splitting companies and sellers so competition can be exercised, and if this is not possible, by regulating the behavior of the strongest market actors.

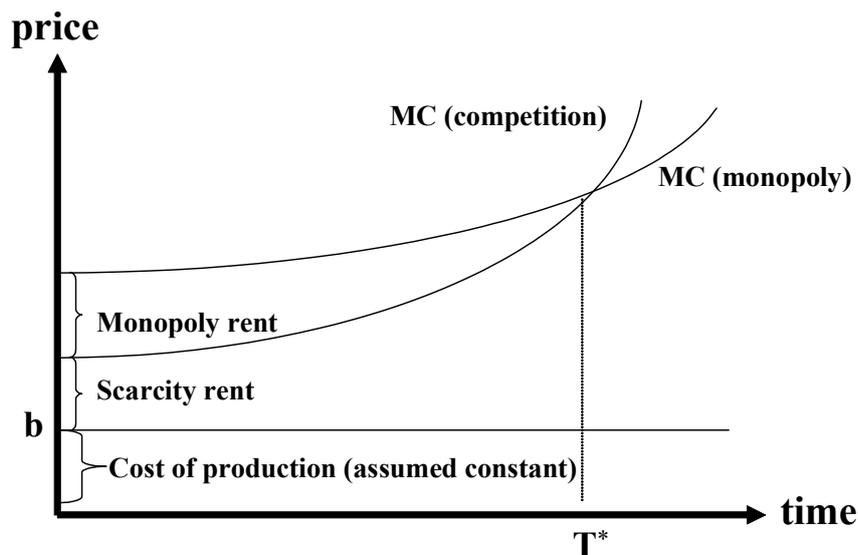
There has been much discussion about the role of the cartelization of resource markets, especially the role of OPEC in the oil market. For the EU gas market there have been concerns about over-relying on natural gas demand, that the few relevant non-EU producers are obtaining a disproportioned market power and the possibility of pressuring prices up. A majority of economic analyses show the consequences of especially Gazprom's market power, presenting various models of an oligopoly situation and its effects on the supply side (Golombek, Gjelsvik and Rosendahl 1995, Neumann and Hirschhausen 2004, Sagen and Tsygankova 2006). Even though this fear of the misuse of market power on the supply side has clear market logic, effects on prices and volumes of a concentration on the supply side in markets for non-renewable resources may be quite different in the short and long-run. While the concentration of supply power often leads to higher prices in the short-run, it may for a non-renewable resource give lower prices than a competitive supply side in the long-run (Dasgupta and Heal 1979:323-334).

To clarify this argument, simplify the supply side to be assumed to be dominated by a single monopoly. With a linear demand curve, a monopolist's price will initially be higher than under competition, as shown in any microeconomic analysis. On the other hand, higher prices encourage conservation and more alternative energy sources will be brought to the market. Demand for natural gas is

substantially more elastic in the long than the short-term. Therefore, over time, a monopoly leads to lower consumption than competition. The higher prices also initiate production in high cost areas, which in its turn contributes to suppress prices. Investment in alternative energies increases. Taken together, the monopolist provides less gas to the market in the short-run and conserves more in the ground for future sales than competitive firms. But clearly, the monopoly may charge a very high (and perhaps unacceptable) fee in order to perform this rationing function.

In a monopoly less gas will be initially supplied and a monopoly rent will be reaped in addition to the scarcity rent assumed to be earned by all owners of exhaustible resources, cf. Figure 5.7. Firms competing with each other have higher discount rates than a monopoly, and initially lower profits. However, after some time  $T^*$ , the competitive price will be *higher* than the monopolist's price; demand is encouraged by lower prices, the resource is exhausted more quickly and the emanating resource scarcity pushes prices up. How long such a process actually takes is, however, difficult to determine and depends not only on geological occurrences of the resource, but also on technological and political developments.

Figure 5.7: Price path under competition versus monopoly



Some modifications can be applied for the degree of concentration on the supply side. In a Stackelberg market (Stackelberg 1934), a single producer, or a group of producers, let other countries sell what they wish and they balance demand by regulating their own production to maintain the monopoly price (they are "swing-producers"). The swing-producers take into account present and future demand, the production of all other suppliers in the market and choose the optimal price path maximizing their wealth over time. All countries, except the swing-producer(s), adjust quantity produced to the prices fixed in the market. The swing-producers behave like monopolists, taking into account both the degree of inelasticity of demand and the reaction to changes in prices among other producers. Such a partially manipulated market will lead to a price path somewhere between the one resulting from pure competition and monopoly.

A Nash-Cournot solution is a modification of the Stackelberg-market (Huck, Muller and Normann 2001, Faulí-Oller and Escrihuela 2007). In this market all actors are active and a non-cooperative game is established. Thus, also smaller sellers have expectations about future prices and other elements of the market that are important in order to optimize production. These types of markets generally lead to a higher price path than in the Stackelberg market. But distribution of production and income between producers may be different, to the disadvantage of the swing-producer and to the benefit of the smaller producers. Boots, Rijkers and Hobbs (2004) apply a model of successive oligopolies to the European natural gas market. Other modifications are made to study effects of degrees of market power within the framework of non-renewable resource economics. These modifications mostly relate to events that took place in the 1970s and 1980s when oil prices were expected to remain high and resources scarce (such as Dasgupta, Eastwood and Heal 1978, Groot, Withagen and de Zeeuw 1992, Newbury 1981).

Saudi Arabia has often been considered a market leader in the oil market. In the European gas market, the oligopoly on the supply side could possibly be called a Stackelberg situation, with Russia as the market leader. But whether one modification of the theory is better than the other, the question remains whether enough demand exists for a swing-producer. With high prices, new entrants are attracted to the market and existing producers will also be encouraged to increase production. Demand will decrease as consumers shift to alternative energies and

introduce various conservation measures. Thus, swing-producers must either set high prices and accept declining market shares in the future or lower prices in order to limit entrance of other producers, increase (maintain) demand and expand profits in the future. Often the problem for decision-makers will be that such long-term considerations can be confused by more short-term price fluctuations.

Taken together, a concentrated structure on the supply side may lead to a more stable development over time than with competition. Hence, from a security-of-supply perspective, market efficiency for an exhaustible resource can be considered different compared with microeconomic efficiency criteria for renewable markets. To make a market for non-renewables efficient over time, a sustainable dynamic resource management should be included in market design. Resource countries to various degrees include optimization of resource extraction in their petroleum policy. For example, a competitive Russian supply side with many actors involved determining investments according to only commercial considerations, may have significantly different outcomes in respectively the short- and long-term. The evaluation of sound resource management may therefore, end up quite differently depending on the time horizon for the optimization.

As EU energy consumption also depends on sound management of these resources, a long-term energy policy for the Community should include bilateral and/or multilateral arrangements that secure optimal resource management in supplying nations simultaneously with efforts to make the market more efficient downstream. Such policy would help the interests of consumer and producer nations converge, provide information and help develop sustainable policies in both exporting and importing countries. As exporters need revenues, and importers need more gas, concerns over long-term supply are shared by both, and should as a consequence make a foundation for common measures.

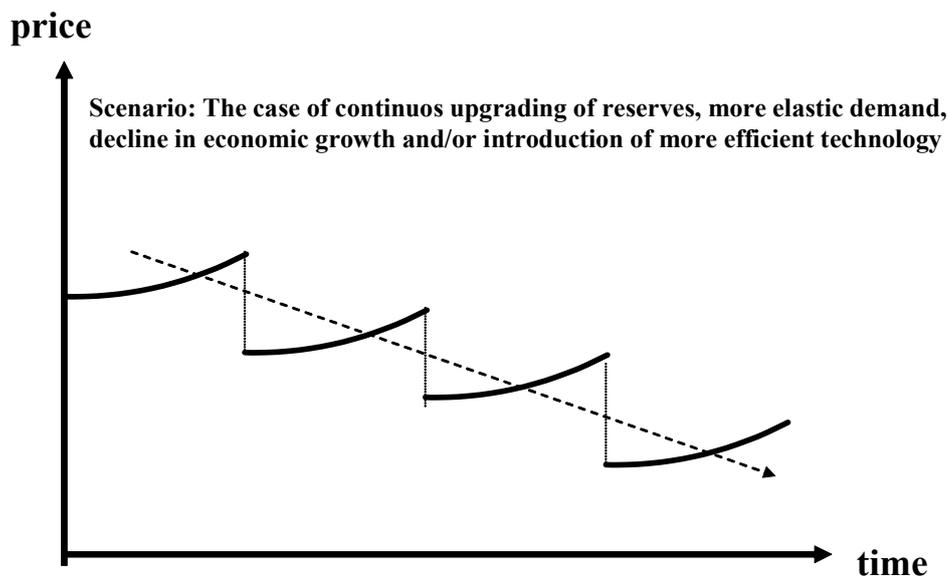
This does not mean however that market power should be of no interest to parties involved. The interdependence between exporters and importers and their shared interests does not rule out competition and conflicts, as discussed in Chapter 1.4. A market with substantial economic rent over long periods of time

(either it is of a scarcity or monopoly kind) gives parties every reason to make efforts to capture it for themselves. Taking rent from someone else in the gas chain may not change the economic considerations for up or downstream investments. If measures are considered not to influence the normal profit of investments adjusted for risks, they may only influence rent distribution between companies and states.

### 5.4.3 Will prices rise or fall?

Most analysts using the theory for non-renewable resources as a basis for understanding markets for non-renewable have concluded that price must rise over time cf. Figure 5.5. However, this is only true in cases *ceteris paribus*. If, for example, reserves are upgraded, demand becomes more price-elastic, economic growth declines and/or technology becomes more efficient, prices should be revised *down*, as illustrated in Figure 5.8, an upgrading of reserves, a more elastic demand, decline in economic growth and the introduction of more efficient technology may contribute to lower prices, cf. Adelman's arguments discussed at the beginning of this sub-chapter 5.4.

Figure 5.8: Producer prices may fall in the long-run



How can this theory be used to understand price developments for exhaustibles, and at the same time, offer advice for production decisions and market regulation? Few, if anyone, can possibly know enough about all the factors influencing price paths and their revisions, in order to predict future outcomes (Berck and Roberts 1996). Nevertheless, the identification of a backstop price and the technical cost of production, will give techno-economic upper and lower limits for how high or low prices can be at a given point of status on the variables influencing costs and backstop levels.<sup>73</sup>

The most important contribution from the theory is that producer's inter-temporal considerations, including being aware of the non-renewable nature of the resource extracted, imposes an opportunity cost on future generations. For Norway the model has particular significance with respect to the establishment of the Petroleum Fund and the later strong growth in petroleum production. *Ceteris paribus*, the opportunity costs of leaving the reserves in the ground for later production are considered lower than the income expected from the yield obtained by exploiting the reserves now and investing them in the fund, cf. Chapter 2.4., This represents a benefit for consumers in the short-run, but a problem in the long-run, as reserves are depleted faster than if more production was delayed.

For the EU, the theory demonstrates that it is important that natural gas reserves are scarce over shorter or longer periods of time. Whatever the character of the scarcity problem, the analysis demonstrates that the EU will benefit from policies making more substitutes available at the lowest possible prices (lower the backstop price), cf. Figure 5.5. The EU will also benefit from making demand as elastic as possible, and thus improving ability to switch fuels and improve efficiency in natural gas transportation, storage and usage (lower the price profile for natural gas), cf. Figure 5.8. These types of measures make the geological non-renewable nature of the natural gas resource less of an economic and political problem, even if there is good reason to also make producing countries search for and produce more gas (upgrading reserves and lower the price profile).

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<sup>73</sup> Austvik (1992) modifies this issue and includes also political variables in the discussion of upper and lower limit for the price of oil in the 1990s.

A market liberalization process that aims only to improve market efficiency and to give consumers lower gas prices appears, as a consequence, shortsighted and risks not functioning over time. Lower consumer prices in the first phase lead to, *ceteris paribus*, higher consumption, more waste of energy, delays in the introduction of more efficient technology and growth in the supply of substitute energy sources, as well as a discouragement of investments in new and more expensive natural gas production capacity. The result is eventually imbalance between supply and demand and high consumer prices.

*“It is clear to all observers that the internal market for electricity and gas, contrary to claims made for it, is neither providing the benefits to Europe’s large industrial users, nor to domestic households” (Thomas 2005).*

High prices will however provide for reduced demand, less waste, the introduction of new technologies and substitute energies, as well as higher petroleum production. The market will most likely solve the scarcity problem in the long-run. Views may however differ as to whether or not something should be done politically to prevent short and medium term problems. Classical economists and scholars from the Austrian school would say “hands off” to governments, while Keynes and other interventionist liberalists would say “in the long-run we are all dead”, cf. Chapter 1.5. Something should also be done in the short and medium term. Resource constraints and the enormous investments needed for new natural gas developments lead to long time-lags between when production decisions are made and when production actually begins. Accordingly, high prices for longer periods may result in developments of a stop-and-go character, rather than long-term and stable.

Taken together, the non-renewable nature of natural gas resources makes it necessary for the EU to develop a more comprehensive energy policy than “simple” market liberalization efforts, as seen through the gas directives to improve market efficiency over time, if stop-and-go-effects are to be avoided. The economics of non-renewable resources differ from renewable resources because they emphasize the perspective of time and that at some point there will be a need for substantial introduction of renewable energy sources, and in the end full substitution of non-renewables. In the long-run, despite debate about the length of the long time-run,

the non-renewable resource is a limited resource, not only in geological, but also in economic, terms.

The non-renewable nature of natural gas consequently challenges supply security if overemphasized in consuming countries' energy portfolio. Relevant amounts of gas for the EU market are located in only a few places, and they will not last forever. Price mechanisms do not work in the same way for the production of non-renewable compared with renewable resources. This study makes no attempt to qualify for how long time societies can base themselves on non-renewables. Even this time period may be pretty long, "temporary" shortages can be severe, as demonstrated in the oil crises of the 1970s/1980s and at present.

Norwegian petroleum policy was quite conscious about the scarcity challenges when restricting production levels in the 1970s and 1980s, cf. Chapter 2.2-3. After the Petroleum Fund was established the theory has largely been used to argue in favor of a faster extraction, because investments in foreign assets are considered to yield more money over time. This view coincides with an EU desire to produce natural gas increasingly faster. However, in the long-run it is doubtful that such policy is optimal for the EU, as there are good arguments to support a diversification away from natural gas. However, when the scarcity is disregarded in market design, the natural gas entrepreneurship is pressured for higher production, not only from companies, but also politically from the EU and EU countries. Disregarding both short- and long-term scarcity problems, consuming nations should want all fields available to be developed as fast as possible.

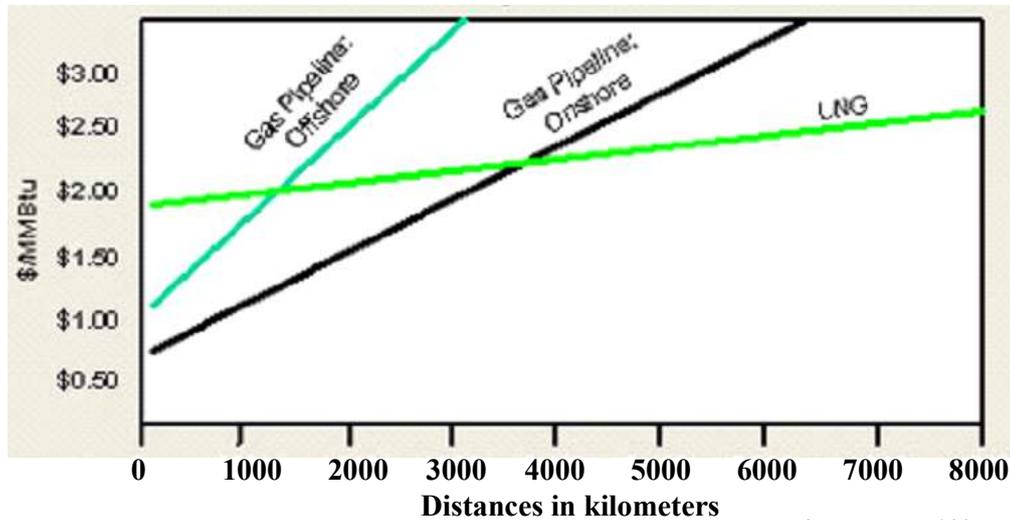
However, in terms of oil, Norway production peaked already in 2004 and is declining relatively fast. The peak for natural gas production is expected to come within a decade or so. Norwegian natural gas entrepreneurship has good reasons for arguing with the EU about these conflicting short and long-term considerations in order to promote a more stable market development. She should also use the opportunity provided by the high prices to continue to build the Petroleum Fund. Commercially, Norwegian gas sellers should reap good contracts in the market and work for arrangements that secure market access and, if possible, a price floor (or guarantee), to prepare for a possible weaker market in

the future and a corresponding (sharp) drop in prices. This would be different from the “price-premium” policy adopted in the early 1980s, when prices were also high and (wrongly) expected to remain so, and export opportunities seemed “gloomy”, cf. Footnote 30 in Chapter 2.3.

## **5.5 Regulatory constraints to full market liberalization**

A fourth constraint against the achievement of a fully liberalized European natural gas market discussed in this study is connected with the economics of natural gas regulation. Social first-best solutions may not be attainable in such markets, and policy choices must be found among several alternative second- or third-best alternatives. A given amount of energy in gas represents a far larger volume than for oil. Transportation and storage of gas calls for many physical requirements, just because it is a gas. Costs per transported energy unit may be ten times higher or more for natural gas than for oil (IEA 1994), and is therefore very important for price determination throughout the gas chain, cf. Chapter 4.1. High investment costs, low flexibility and considerable economics of scale are prevalent in the natural gas industry. Gas transported by pipeline as opposed to as LNG is less flexible. Figure 5.9 illustrates some important relationships between LNG and natural gas pipeline transportation, as calculated for years 2000-2002. Transportation of gas as LNG is considerably more expensive than via onshore pipelines over “short” distances, while it may be cheaper over very long distances (from about 4000 km). For offshore pipelines the breaking point is considerably shorter (some 1500 km).

Figure 5.9: LNG and pipeline transportation costs relative to distance



Source: Foss 2007

Variable costs of operating gas pipeline transportation relative to the capital costs are considerably lower than for oil transportation. IEA (1994:49) considers operation and maintenance of pipelines, except compressor stations, as fixed costs. They estimate them to represent annually one percent of offshore investment costs and two percent onshore. The maintenance costs for compressor stations are assessed to be annually 3-6 percent of investment costs at relatively high load factors. Thus, when investments are made, variable costs by and large are also given even if transported volumes change. A high or low load factor will therefore, strongly influence costs per transported unit, but the total costs, hardly at all. As economies of scale exist over such large quantities of gas, pipeline transporters are often natural monopolies in the markets they operate.

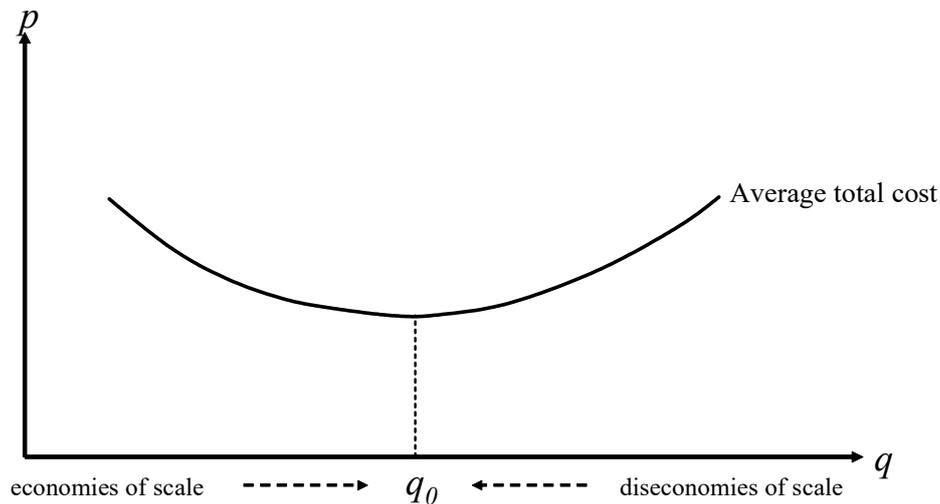
A natural monopoly is a type of monopoly that exists when it is less costly to satisfy demand with only one company operating in the market than for two or more firms. The monopoly is in this sense 'natural' (Baumol 1981, McEachern 2005). However, a one-firm market is not necessarily optimal if the firm abuses its monopolistic market power and/or allocates inefficiently. Without public intervention, such firms may behave as monopolists without much fear of competitors entering the market, prices rising excessively and offering increasingly more inferior products and services with inefficient use of resources.

### 5.5.1 Cost savings due to economies of scale and scope

Natural monopolies can arise when there are economies of *scale* and/or *scope* in the production of goods or services. Economies of scale exist when it is less costly for one firm to produce a single commodity (or service) than it is for two or more firms. Economies of scope exist when one firm can produce two goods or services at a lower total cost than if independent firms produced each of them.

In the very long-run, all costs for a firm can be considered variable and fixed costs are zero. In most cases, however, depending on what is considered to be short and long-run, some costs are fixed, and total costs of production consist of fixed plus variable costs. Whenever there are fixed costs, average cost must fall for output levels close to zero and rise with larger quantities of output when capacity is pressured. Large fixed costs are the most prevalent source of *economies of scale*. The fixed costs must be incurred no matter how many units of output are produced. This is shown in Figure 5.10, where average costs fall up to output  $q_0$  and rise thereafter. This plant has economies of scale at  $q < q_0$  and diseconomies of scale at  $q > q_0$ .

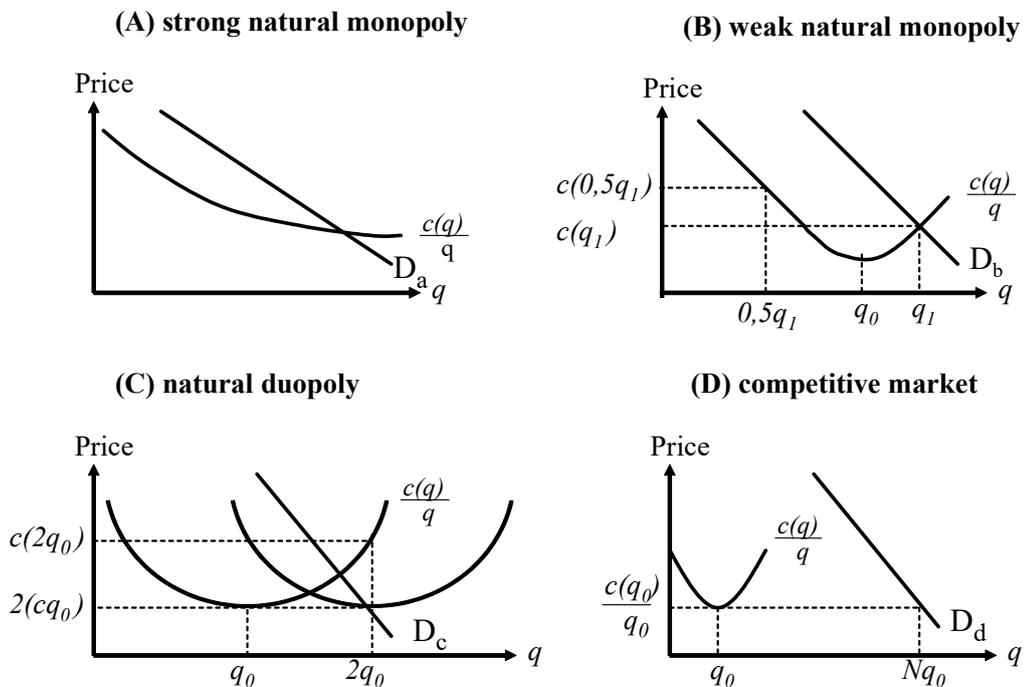
Figure 5.10: Average cost and economies of scale



This is the general form of an average total cost (ATC) curve for any firm. The difference between a plant usually said to be having economies of scale and a

competitive firm is that  $q_0$ , or cost minimum, occurs at high output levels compared to market demand. When there are economies of scale for a sufficient part of the production compared to demand, the firm becomes a natural monopoly supplier in providing this product or service. Thus, for two transmission companies having identical cost functions, one of them can operate as a natural monopoly in a market, while the other may face some degree of competition. The difference is that demand in the second market is larger than in the first, and large enough so that the economies of scale are exhausted. Figure 5.11 illustrates this in more detail.

Figure 5.11: Average cost and demand



Source: Train 1991:7

Section A shows a situation where average cost decreases over the entire scale of operation to the left of the demand curve,  $D_a$ . Let the average cost of producing output  $q$  be expressed by the function  $c(q)$ . Decreasing average costs can be expressed as:

$$(i) \quad c(q_i)/q_i > c(q_j)/q_j \quad (\text{where } q_j > q_i)$$

This is the most usual expression for economies of scale and insures that one firm can produce the good at the lowest cost, rather than two or more firms. However, this is not a necessary condition for the existence of economies of scale.

In section B, the demand curve  $D_b$  intersects the average cost curve within the area of diseconomies of scale at  $q=q_1>q_0$ . Average costs are falling at outputs  $q<q_0$ , but are increasing for  $q>q_0$ . Let average cost of producing  $q_1$  be  $c(q_1)$ . If two firms share the market equally, so that each produces  $0.5q_1$ , average cost for each will be  $c(0.5q_1) > c(q_1)$  (assuming identical cost functions for both firms). An uneven division of the market would give different average costs, but the sum of costs would still be larger than  $c(q_1)$  and the firm would operate as a natural monopoly due to economies of scale.

The fact that the firm is a natural monopoly also for outputs  $q_0<q<q_1$  is explained by the term *subadditivity* (Train 1991:11). A cost function is subadditive at  $q$  if and only if:

$$(ii) \quad c\left(\sum_{i=1}^m q_i\right) \leq \sum_{i=1}^m c(q_i) \text{ for all quantities of } q_1, q_2, \dots, q_m \text{ where } \sum_{i=1}^m q_i = q$$

This condition is necessary and sufficient for costs to be lowest when one firm operates the market. In a more compact form, the condition for subadditivity for output  $q_1$  can be written as:

$$(iii) \quad c(q_1) < c(q) + c(q_1 - q) \text{ for } 0 < q < q_1$$

If  $q_1$  is the largest possible demand in the industry (where the demand curve intersects the ATC curve) and inequalities (ii) or (iii) hold, then  $c(q_1)$  is strictly subadditive and the industry is a natural monopoly. Thus, a cost function can be subadditive even if there are substantial diseconomies of scale at the actual level of output. A firm that has decreasing average costs across the scale is called a *strong* natural monopoly and satisfies function (i). If it only satisfies function (ii) or (iii), it is called a *weak* natural monopoly (Berg and Tschirhart 1988:24).

If demand compared to cost should be as high as  $D_c$  in section C, two companies can produce  $2q_0$  at a lower cost than one firm. If one firm should produce all output, it would do so at a higher average cost, as  $c(2q_0) > 2*c(q_0)$ . The market turns into a natural duopoly (or perhaps oligopoly, if demand is even

larger). If demand is really large as compared to the efficient scale of operation, as illustrated by  $D_d$  in section D, firms are facing a competitive market. This brings us back to the situation with a number of firms ( $N$ ) all producing  $q_0$ .

*Sunk cost* is closely related to fixed cost. Sunk cost can be defined as the difference between the *ex ante* opportunity cost and the value that could be recovered *ex post* after a commitment to a given project has been made. Thus, the larger part of a project's fixed costs that are sunk cost the stronger the natural monopoly.

Costs can however be saved not only by exploiting economies of scale, but also when a firm is producing more than one product or service. Even though each segment of an industry produces a unique type of output, companies may "bundle" services in order to save costs. When *efficient* bundling of services takes place, within each segment and across the gas chain, it is due to *economies of scope*. For example, a producer can search for gas, drill and run a gas field. He can also produce oil from the same field. The transmission company can, next to transporting the gas, also function as a broker and wholesaler and offer storage for its customers. Joint production of oil and gas, and transmission services may more efficiently be organized when planned together rather than independently (served through a market). Similarly, local distribution companies can, besides distributing gas to households and businesses, offer storage, equipment for end-users and advice.

The existence of scope economies indicates that gas companies' bundling services may have competitive advantages over companies operating in an unbundled manner.<sup>74</sup> Teece (1990) argues that benefits from joint operation of successive operations may occur if there are:

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<sup>74</sup> Coase (1937) posed a rather simple question: Why are we having firms and organizations in general? In a perfect market economy, economic activities would be less organized through firms. An economic actor would rather buy all part functions as marketing, management, finance etc in a spot market. It would not be possible to organize these activities in a more efficient way than what the market can provide if it is perfect. Firms exist however because markets are not perfect, and it is better to deal with the logistics of the different interrelated functions by internalizing them in the actors' decision making in a firm or organization rather than relying on others supplying them.

*Informational efficiencies*, where one firm may better know the bottle-necks in transportation, producers' opportunities and limitations, customers demand situation etc., than if operations are split to more firms.

*Operating efficiencies* including pressure controls, rerouting of gas during maintenance work etc. Since gas leaves and enters many stages on the way from producer to end-user, (many of) these operations may better be dealt with under one management rather than many.

*Aggregation economies* that is achieved if one supplier, better than two, can match demand from different customers. The economic and political costs of failing to supply or purchase are great.

By bringing the decision processes under the management of a single firm or under coordination between firms, greater security and stability of supplies to the market can be provided, when short-term supply disruptions are costly and rapid access to alternative supplies is inhibited or impossible. With one management, or explicit coordination between two or more managements, gas transmission companies may become more credible if they have aggregated customers and suppliers adjusting to changes. The long-term "old" TOP contracts between producers, on the one side, and consuming countries' transmission companies on the other side, may be considered an approach to optimizing the advantages of joint management of transmission and production. By integrating vertically a firm may also avoid opportunistic behavior from parties earlier or later in the gas chain. Centralized managements may handle vertically linked processes more easily than through market transactions. Signing too many contracts may be time-consuming and costly and hamper a firm's ability to produce efficiently. If overall profit is the goal, rather than maximum profit in each segment, one firm may more easily provide an efficient solution than two or more firms.

Let's assume that the average unit cost of producing two goods or services,  $x$  and  $y$ , can be expressed by the function  $c(x,y)$ . If one company produces only  $x$  and none of  $y$ , the costs for this single product would be  $c(x_1,0)$ . Similarly, if a company were to produce only  $y$  and none of  $x$ , its cost function would be  $c(0,y_1)$ . The total cost of producing  $x$  and  $y$  separately would be  $c(x_1,0) + c(0,y_1)$ . Economies of scope exist if:

$$(iv) \quad c(x,y) < c(x,0) + c(0,y)$$

*Diseconomies of scope* exist when any co-production of  $x$  and  $y$  will lead to higher costs than if production were separated and executed by independent companies;  $c(x,y) > c(x,0) + c(0,y)$ .

If a natural monopoly bundles services due to scope economies, many combinations of  $x$  and  $y$  can allow it to earn an economic profit. A gas producer may i.e. run a normal profit, or even a loss, on a petro-chemical plant, but obtain economic profit in the transmission system they operate. When this occurs, prices cross-subsidize each other. Equivalently, a transmission company could run a broker- and wholesaler function with normal profits, while the transportation function is run with an economic profit, and vice versa.

Economies or diseconomies of scope may occur with or without economies of scale. Costs may be saved for one firm by producing both services at small volumes, but not at large volumes, even if economies of scale are present all the time and vice versa. For a company, the optimal mix of production will also be determined by how economies and diseconomies of scale and scope are distributed compared to demand. This will also determine whether a single plant and/or a firm producing more than one output is a natural monopoly or not.

This implies that while almost all distribution companies will be natural monopolies in providing services, there will be a continuum of different situations for the transmission companies, varying from being a strong natural monopoly at one end of the scale, to degrees of competition at the other end. The market for transmission services can however never be fully contestable. The needs for public intervention prevail; and yet, how these interventions ought to be made varies. We shall study these degrees of market power more closely.

### **5.5.2 Opportunities for and limits to market power for transmission companies**

An invoice from the transmission company to shippers (being producers or customers) can incur the cost of transportation, for example as common carriers, or implicitly as the difference between sales price to customers and the purchase price from producers, as private carriers (cf. Footnote 52). With significant

economies of scale (and perhaps scope), transmission companies tend to become powerful towards producers as monopsonists, and towards customers as monopolists. This is particularly true in the second stage of the development of a gas market, cf. Chapter 4.1. As profit maximizers they have the potential of negotiating low prices to the producers/exporters and can charge high prices and exploit any possible inelasticity of demand from their customers.

Let the tariff (per unit price of transportation) for a private transmission carrier of natural gas be denoted  $s_t$  (see also Figure 4.6). The difference between the price it pays for the gas from the producer ( $p_p$ ) and the price it receives from the distribution company ( $p_d$ ), is then  $s_t = p_d - p_p$ , which, disregarding all operational and investment costs and physical losses, equals its profit. A monopsonistic pipeline towards suppliers operating as merchant faces a price function that will increase with quantity ( $q$ ) purchased from the producer. If the transmission company is the only purchaser, it will bid up the price paid to producers when increasing throughput, expressed as:

$$(v) \quad p_p = p_p(q), \text{ where } dp_p(q)/dq = p' > 0$$

On the other hand, being a monopolist towards its customers, the price the transmission company receives from them will decrease with increases in quantity sold:

$$(vi) \quad p_d = p_d(q), \text{ where } dp_d(q)/dq = d' < 0$$

The pipeline company's profit ( $\Pi$ ) will be:

$$(vii) \quad \pi = s_t * q = p_d(q) * q - p_p(q) * q$$

Setting the derivative of (vii) with respect to quantity to zero yields:

$$d \pi / dq = q * d' + p_d - p_p - q * p' = 0$$

$$(viii) \quad \Rightarrow p_p + q * p' = p_d + q * d'$$

The left side of (viii) expresses the marginal cost of buying gas from the producers. The element  $q * p'$  tells us how much the price of gas to producers will increase if the pipeline company buys an incremental unit. The right side of the equation expresses the marginal revenue of selling one additional unit of gas. The

element  $q * d'$  tells us how much the price of gas to customers will decrease if it sells one more unit of gas. Not surprisingly, the equation shows that at maximum profit, marginal revenue from selling an additional unit of gas will equal its marginal cost. The special point in this case is that the transmission company, by restricting quantity traded towards producers and distributors, power plants and large industrial users in this optimal manner, can *simultaneously* exploit inelasticity of demand and supply in order to maximize its own advantage. It is possible, but somewhat unlikely, that this situation is socially efficient or maximizing public welfare, and a fundamental argument from a social point of view for the need to regulate its behavior.

More factors determine however the transmission companies' market power in addition to scale (and scope) economies. One factor is the power of producers and customers that the transporter meets at its end. By concentrating sellers and customers' power, a counterforce to mitigate pipeline companies' market power is created. The market power of the transmission companies is also limited if there is an alternative route or method of transportation. Often, the building of another pipeline may incur costs that are too high to represent any credible threat to the existing one. LNG as an alternative to pipeline transportation, may, in some cases, put a limit on the upper level of a pipeline company fee (intermodal competition).

In end-user markets, competition from other fuels, in particular oil products, but also coal and (nuclear) electricity in district heating, provide a price cap on gas. To the degree that customers can switch quickly and cheaply between fuels when gas prices change, LDCs monopoly power towards end-users are restricted by interfuel competition. The prices of alternative energies represent the limit on total market turnover, and on how much rent the various segments of the gas chain can "fight over". Competition from substitute products makes demand more sensitive to price changes and, thus, restricts the degree of market power by sellers. But, it usually does not eliminate it.

Taken together, with some modifications, the barrier to entry is significant in pipeline transportation, and transmission companies have great potential with respect to the exercise of market power, both towards producers and customers.

The potential for and benefits of market power, may lead to "over-bundling" of services and over-investment in capacity in order to deter newcomers. Even without cost-saving advantages in bundling, firms may profit by doing so due to the benefits of increased market power. For a transmission company, for example, there may be economies of scale in transportation of gas, but not necessarily economies of scope with the role as a wholesaler. The broker role may in some cases inhibit elements of economies of scope with the transmission service and in other situations independent firms could do it more efficiently. By having the exclusive rights (natural monopoly) in the transmission function, the pipeline company has the power to prohibit other companies wanting to act as brokers, take over their potential profit and obtain a monopoly in providing merchant services. This will put constraints on contact between producers and end-users and decrease market efficiency. While the pipeline company gains, there may be a net loss for society.

The relationship between dependency and the mutual benefit of the activities of producers, pipeline companies and customers may be of a sensitive or vulnerable character, cf. Chapter 5.3.1. When large disparities in the market positions arise, market power is wielded. The type of dependency expresses the parties' ability to adapt to changes in access to transportation and/or the tariff to be paid for transportation. Closing the access or a high tariff may for instance make it unprofitable to contract gas for producers and customers.

The "old" European gas market was balanced between huge companies on all sides that negotiated business terms. It secured long-term contracts and investments downstream, as well as upstream. Gas resources were exploited in a planned manner together with the development of downstream infrastructure. For a liberalization process it is a challenge that the situation for the various transmission companies is not uniform. The market situation is better described as a mixture of the three stages discussed in Chapter 4.1. Scale and scope economies and market size vary, and price and profit limitations are faced from competing energies and routes of transportation. The role and behavior of the regulator is consequently of utmost importance in a market liberalization process for natural gas, but to regulate all transmission companies so that first-best behavior is achieved is an intriguing challenge.

### 5.5.3 The roles and goals of the regulator

Transmission systems are integrated parts of the gas market that should balance competing demand for transportation services, optimal resource management and risk evaluations. From a social point of view, it is important that economies of scale and scope are exploited, but at the same time market inequities caused by extensive pipeline concentration and excessive bundling by transmission companies should be neutralized. An optimal gas grid should enhance security-of-supply for consumers, as well as security-of-demand for producers. The system should secure flexibility both in a static and dynamic sense. The former by creating a variety of arrangements suiting each actor. The latter by permitting arrangements to evolve gradually based upon market trends, rather than through radical change every few years. These goals are sometimes complementary and sometimes conflicting. Ideally, the grid should barely figure in producers' production decisions and the consumers' choice of energies.

A regulatory regime that aims to optimize the transporters' behavior should in a liberal design primarily look for arrangements that do not place this judgment upon public policy makers. If one can find self-regulative arrangements, there is a greater chance that the system contains the necessary dynamics when market conditions alter (EU 2003e). This is also important in order to impose minimal administrative costs. Even if a regulation may yield a socially efficient outcome, the costs of the enforcement process need to be subtracted from the benefits achieved, and compared to the costs of operating the existing system. This is in order to appraise net social benefits. In the U.S. conditions under which gas could be produced and transported have repeatedly led to undesired results, cf. Chapter 5.5.6.1. After some years, regulations were removed and new ones introduced. However, this was only after having incurred considerable legal and regulatory costs, loss of efficiency and social welfare.

An additional argument in favor of self-regulative arrangements is that the regulator over time does not necessarily need to only seek to maximize social welfare. A regulatory agency may begin its existence with public interest in mind, but end up as an agency to protect producers and/or pipeline companies. The persons employed in the regulatory agency may be influenced by his or her

career opportunities, political motives, self-assertion, power, etc. The regulated companies can gain control over the regulator and trap or capture the regulator, so as to act in their interest and influence the goals that the regulator sets and the way he/she seeks to attain them. Such "capture" can be encouraged by the movement of personnel between regulatory agencies and the firms, thus increasing the desire for cooperation and building close ties between them.

Regulatory policy that involves transfer of huge sums from a large group to a small group is also often more easily lobbied by members of the small group. The small group has a lot at stake per capita, and can more easily organize themselves than a large group. Therefore, small groups are usually more successful in satisfying their demands towards public policy makers than large and often more diffuse groups, as was also discussed in the influencing of nation states' trade policy in Chapter 1.6. With huge interests at stake, (producing companies,) transmission companies and its customers (LDCs, gas power plants and industrial users) have good reasons for vociferously pursuing their interests. Stiegler (1971) argues that public regulation therefore tends to lead towards industry-protectionism.

Maximizing social welfare depends, therefore, on how it is possible to avoid inefficient bundling in the natural gas industry and keep, or even create, efficient bundling and exploitation of economies of scale and scope (Just, Hueth and Schmitz 2004). How is it possible to prevent firms from taking unacceptable advantage of possible strong positions in segments of the market? The correct answers to these questions will easily be viewed differently by competing parties, and these groups may pressure regulators. In order to design an efficient and welfare-maximizing way of regulating the market, one needs a closer identification of the actual goal of the regulation.

Microeconomic theory is often used for this purpose, i.e. that the ideal situation exists in the market when price equals marginal cost (corrected for externalities). In perfectly competitive markets, there should be no need for public intervention (the *first best* solution). If one market failure arises, such as the existence of a cartel or of pollution, marginal social cost no longer equals marginal social benefit. In order to correct for this market failure, governments

should intervene to restore the first-best situation, where social benefits equal social costs. A first-best economy operates under conditions of social efficiency (Pareto optimality) and the policies introduced correct the market distortions that occur.<sup>75</sup>

However, in the real world, this is rarely possible. In a *second-best* economy, compromises between theoretical first-best solutions and the real market are appropriated. The application of a second-best policy means that the distorting effects of the market will be minimized. Policy measures, other than nationalization, generally lead to second-best solutions. In fact, one could argue that nationalization is also a second-best solution (at best), as over time it does not satisfy social efficiency goals, even if this is the intention.

Of course, effective public intervention needs to consider political, cultural, practical and other issues, in addition to the knowledge of economics. Seeking to practice a pure economic model within the real world, i.e. in constructing tariffs for gas transportation, may lead to other results than what should be expected. Economics may first of all give insight into the processes around and the purpose of regulation, describing important forces operating towards optimality. By understanding these forces, the regulator can use this insight together, along with other aspects taken into consideration, to improve welfare and market efficiency and move towards optimality, although not necessarily reaching it. This is a case in the multidisciplinary approach adopted in this study: analyses from economic theory of an optimal design of liberalized market are used as an important input into other analyses suggesting how the system should actually be constructed.

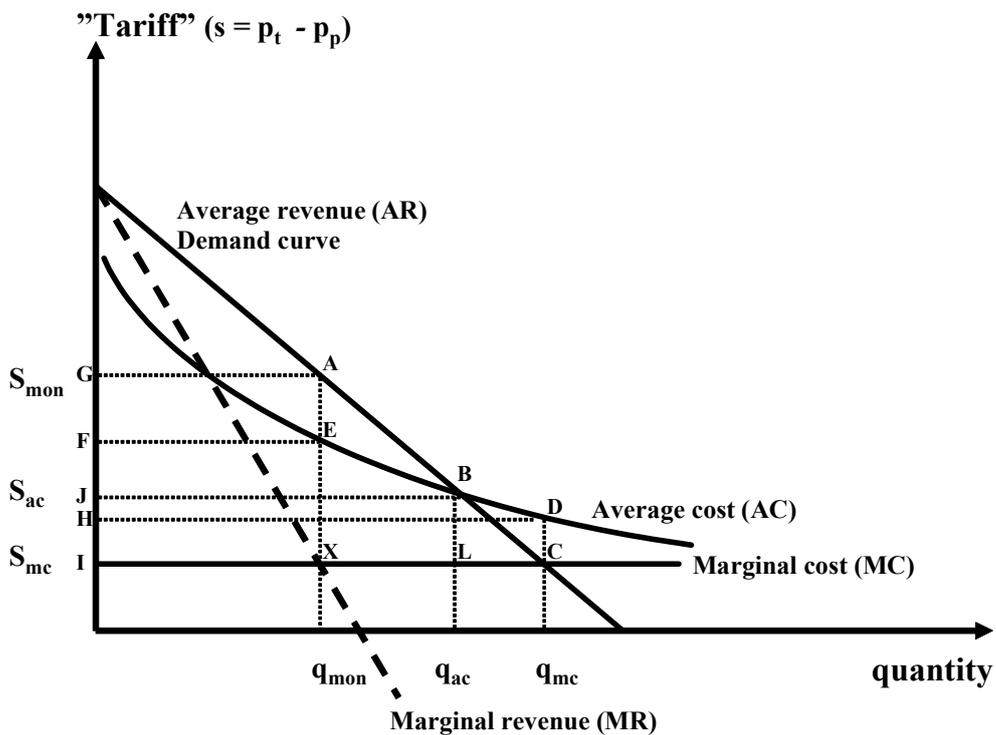
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<sup>75</sup> *Private cost* to an individual person or a firm is measured at market prices. In many cases, private cost approximate the opportunity costs (the value of a foregone action) of employing inputs in an activity or production process. Private efficiency is attained when marginal benefits equals marginal costs. *Social cost* reflects all costs incurred by a society in producing a good or a service, or the opportunity costs to the society of the resources which it uses. Thus, social costs equal private cost plus externalities of production (costs borne by people or firms other than the producer) (Turvey 1963, Field 1997). Social benefit equals private benefit plus externalities in consumption (benefits from production (or consumption) experienced by people or firms other than the producer (or the consumer). In most cases there is a divergence between private and social costs and benefits of a production activity.

### 5.5.4 Laissez-faire, nationalization or regulation?

To illustrate the choices and challenges faced by a regulator of the transportation system in a natural gas market we will begin by simplifying the position of a transmission company to that of a strong, natural monopolistic actor, due to economies of scale, with low (and constant) marginal costs compared to fixed costs, cf. Figure 5.11A / equation (i). The position and shape of the demand curve (assumed linear and falling) determines which output-price combinations are possible in this market, cf. Figure 5.12. We discuss three possible outcomes. At point A, the firm acts as a monopolist choosing a high price/low output combination. At point B, the firm acts as a 'cost-plus' company where price is set equal to average cost. At point C, the firm produces an output so large that price must equal marginal cost, in order to make consumers absorb the entire output.

Figure 5.12: Regulation of a natural monopoly gas pipeline



Point A: A monopolist would choose to produce where marginal revenue equals marginal cost, which happens at point X. The production (or the amount of

transported gas) will be  $q_{mon}$ . For this quantity, consumers are willing to pay the price, or tariff, denoted earlier as the share to the transmission company,  $s_{mon}$ . The company's economic profit will be GAEF, which results from the difference between market price and average costs at output  $q_{mon}$ . If the company increases production beyond this point, marginal cost would be higher than marginal revenue and it would lose money on the margin.

Point C represents the other extreme: If output increases beyond  $q_{mon}$ , this would be more optimal from a social point of view. The willingness to pay is larger than the marginal cost of providing service all the way up to point C. Thus, point C is considered to be the socially most efficient level of production because it maximizes consumer and social surplus. The problem is that the price for transmission at point C,  $s_{mc}$  is below average cost and the company loses money unless someone is willing to pay the deficit. The loss is represented by area HDCl, which is the difference between the market price and average costs times output  $q_{mc}$ . The net advantage for society by moving production and prices from point A to point C is represented by area ACX, but the benefit for consumers would be as large as ACIG.

If the company is to break even, price must equal average cost and this occurs at point B. At this point an output of  $q_{ac}$  is produced at price  $s_{ac}$ , and the company earns normal profit, but no economic profit. This point is also more optimal for society than the monopoly solution at point A. The gain for consumers (GABJ) is obviously larger than the loss for the producers (GAEF) compared to monopoly. Society's net gain equals area ABLX, while the deadweight loss is BCL compared to the first-best solution at C. Point B is a second-best-solution from a social point of view as compared to point C.

Historically, *nationalization* (point C) has been widely applied in Europe after World War II. Under nationalization, the government replaces the market by providing the service or good itself. When nationalized, the governmentally owned company, usually or at least in principle, sets price equal to marginal cost. As long as average costs often exceed marginal cost for this type of natural monopoly public budgets must transfer funds to the firm to cover the deficit (HDCl). However, marginal cost pricing is a necessary, but not sufficient,

criterion for maximizing social welfare. It ignores the question of the 'best' or 'fairest' distribution of income. It may be possible to reach a higher level of welfare with an 'inefficient' form of production than with an efficient one. This could happen if income distribution is 'sufficiently wrong', or if it is difficult to reach the most efficient form of production, which is an assessment made outside the logic of Figure 5.12. In such a case, it would be better to look for second-best solutions for how the goods or service could be provided.

*Regulation* (point B) is a second-best solution and has historically been the American way of intervening in such markets. Public regulation may be achieved by force, or by incentives, inducing the firm to act in its self-interest, which at the same time is compatible with social goals. Under regulation, the goal is to make the firm decrease price/tariff, increase output and produce this output efficiently at minimum cost. The firm must earn normal profits on its investments in order to remain in business, but no economic profit. However, this simple goal is not that simple to reach.

Often *laws* about market structure and the behavior of firms are part of a liberalization process in a market. Laws may prohibit or regulate the behavior of firms that are seeking to impose external costs. For example, a firm can be banned or face restrictions with respect to pollution. In the case of monopolies and oligopolies, laws can be used to change the structure of the industry or the behavior of the firms within it. When affecting market structure, laws can make mergers (horizontal integration) illegal.

Even though there may be a large number of firms in the market, one or a few may control a major part of it and, thus, behave as a monopolist/oligopolist. Thus, market concentration can be measured in terms of how many firms control a certain market share, or by a Herfindahl-Hirschman index<sup>76</sup> (Hirschman 1964). The government can make a merger illegal if the degree of market concentration is too high. If firms already control too much, they can be split into smaller firms. Whether this is efficient or not however, depends on the cost structure of the activity compared to the size of market and the behavior of the firm. Competition

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<sup>76</sup> The sum of the squares of the market shares of each individual firm to measure industry concentration.

laws in the EU, therefore, study the actual performance of the firms, rather than market share as assessment as to whether or not, for example, a merger should be considered illegal.

*Taxes and subsidies* are often favored by economists to compensate for market imperfections. They are used both to improve social efficiency and to redistribute income. To improve efficiency, taxes can be used to reduce social costs of (negative) externalities, monopoly power, imperfect knowledge and irrational behavior. In some simplistic cases, taxes can be used to achieve first-best solutions. However, because it is usually infeasible to use different tax and subsidy rates towards firms, and because the government lack detailed knowledge about markets, taxes and subsidies seldom achieve more than second-best solutions in the case of natural monopolies.

The EU has as a goal chosen to follow the American way and for the principle of pricing of services at point B in Figure 5.12. But, it has yet to formulate common principles for how the tariff shall be calculated. There are many techniques for such regulations.<sup>77</sup> Each represent second-best solutions from a social point of view, but they are usually better than leaving the firm unregulated. As long as regulators desire to 'repair' misallocation of resources caused by imperfect markets, the system of regulated (private) enterprises can easily end up with outcomes that are either over-determined, or have too many degrees of freedom to yield the desired result.

In the present EU regime it is up to national authorities to define and apply principles that are equal for all parties in the (national) markets. Tariffs can consequently vary a great deal across countries, and should not always end up in B, but between B and A. The EU even allows for countries to choose negotiated tariffs (which Germany has chosen), which should also lead to an outcome at a point between B and A, but perhaps closer to A in Figure 5.12. Regulation of natural gas transportation will remain of the utmost importance in coming debates over EU natural gas market liberalization. Accordingly, this is not only a

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<sup>77</sup> Austvik (2000:132-160) discusses various schedules for regulatory design.

question of whether regulation takes place on national or EU levels, but also how regulatory schedules are designed.

### 5.5.5 Regulation as a “second-best” approach

Hence, the varying degree of scale and scope advantages in various segments of the European gas market makes it difficult for a regulator / regulators to find an optimal portfolio of competition, tariff structure and unbundling. Some challenges can be mentioned:

1. The first question will be *what a reasonable tariff is*. With the discussion above in mind, it can be defined as covering average costs in the systems (point B in Figure 5.12). The only profit included should be normal profit, or the opportunity cost of running the operation, which is calculated into the cost curves, together with other costs. It is, however, hard to determine the average costs in such a natural monopoly because it will drop with the increasing degree of utilization. A pipeline, which uses half its capacity, will for instance have considerably higher average costs than a pipeline with full use of capacity. There is also the question of dealing with how costs are to be distributed between users. The simplest way is to demand the same rate from all gas owners. But, one might also envisage discrimination between customers, for example according to their elasticity of demand (conditional on season and/or industry), so that the total revenue for the pipeline company on average corresponds to the costs of the system (so-called “Ramsey” or “peak-load” price determination, cf. Ramsey 1927).

Averch and Johnson (1962) are considered among of the most influential investigations into regulation effects on firm’s behavior. They (A-J) showed that perhaps the most tempting approach is to regulate the return on capital, and that it didn’t necessarily mitigate the aspects of monopoly control that the regulation addressed. They even concluded that such regulation could make the situation worse. In essence, the A-J analysis showed that a firm then adopts an inefficient production plan, as its marginal rate of transformation between capital and labor exceeds its cost--minimizing level, when the regulator sets the maximum rate of return on capital to be higher than the (market) price of capital (otherwise no investments will be made). This implies that it over-invests and

accumulates capital in order to ease the rate of return constraint. This is called the *A-J effect*. The regulated uses more capital than the unregulated, which leads to an inefficient form of production. Thus, the output produced by the regulated firm can efficiently be produced with less capital at a lower cost.

Some modifications have been proposed to this type of regulation (Train 1991:20-67, 94-113 and Berg and Tschirhart 1989:324-333). Rather than constraining the rate-of-return on capital, a constraint can be put on the return on output, revenue or cost. Such modifications may induce the firm to behave in a more optimal manner than when return on capital is regulated. However, regulating either the return on capital, revenue or cost produces inefficiencies in the firms' behavior. Regulation of return on each unit of output produced is the form of regulation which has the greatest chance of achieving an optimal solution that in some senses may optimize social welfare, disregarding the problem of actually setting this rate with weak insight in a firm's cost curves.

Coase (1946) argued however that the first-best solution for a natural monopoly (price equal marginal cost) could be reached if demand for usage was fixed and an access/usage pricing system was used. The access fee should be set to cover the natural monopoly's fixed costs and the usage fee to cover the marginal cost of usage. In this situation, the aggregated access fees are considered a transfer of funds from consumers to producers, as if the firm received a subsidy from government. The access fee will not affect consumption of service as long as the access fee covers fixed costs. The firm will benefit by supplying more output as long as price is equal to or higher than marginal cost. When demand for access is fixed and the fixed cost are covered by the "subsidy", the firm will gain by reducing usage fees down to the marginal cost of production. Up to this point consumer's willingness to pay is greater than the firm's marginal cost of providing the service. Any other price will incur a loss and, accordingly, the firm will run in an efficient manner.

Coase's approach can be complemented by a block-rate system; to discriminate according to customers' willingness to pay for example in peak and off-peak periods. Riordan (1984) discusses how fixed capacity pricing can be achieved through a regulatory mechanism. The idea is that the firm receives a

subsidy from the government, or charges an access fee amounting to the fixed costs of capacity minus the amount prices exceed marginal cost times capacity. In order to do this, the regulator needs to know the price charged in the market, the actual capacity of the firm and its variable and fixed costs, but he does not need information about the demand curve. The information needed is usually accessible, at least as an approximation, even in natural gas markets. By giving subsidies or regulating the access fee, Riordan suggests that the regulator can induce the firm to install the optimal level of capacity. Since the firm will be indifferent to which capacity level is chosen, as long as it earns no more than normal profit in any situation, he suggests that the regulator should actually know the level of capacity by his/her own calculation. By subsidizing or regulating access charges according to the capacity level which is optimal, the firm will actually choose this level. Any other choices will result in less than normal profit.

2. Another question is *how to distribute a possible excess demand* beyond pipeline capacity. Who will have their gas transported when demand is so great that the existing pipeline network cannot transport it all? A *pro rata* system distributes remaining capacity in proportion to contracted quantity (common carriage, cf. Footnote 52). Existing customers' volume is reduced proportionally in order to make space for new customers. In the U.S., which has been using the *pro rata* system, downstream customers can choose between buying a good bundled - both gas and transportation - from a pipeline or paying the unbundled transportation charge. All shippers according to their nominated volumes share the burden of excess demand.<sup>78</sup>

Another alternative has been to deal with "high-priority" customers before those with "low-priority". In the United States, cf. Chapter 5.5.6.1. FERC defines "high" and "low" priority. Schools, hospitals and small commercial users have high priority, while large industrial direct users have low priority. Of course, other priority rankings are possible, such as first-come first-serve, bidding and

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<sup>78</sup> In order to give access to new customers, the initial volumes cannot be used as an allocation device. Such a *pro rata* system is used in a Common Carriage arrangement (as in the U.S.).

auctioning etc.<sup>79</sup>A third way is differentiated contracting of the service. By paying a somewhat higher tariff, the customer may buy a fixed service instead of an interruptible one at a lower tariff, i.e. interruptible services are replaced by gas with fixed service contracts. The amount of fixed allotment contracts may not exceed pipeline capacity.

The problem of excess demand allocation has been particularly debated within the natural gas industry. The Ramsey pricing principle may cause intolerable distribution of income, as those in most need pay the most. The disadvantage of the *pro rata* system is, among others, that volumes are not distributed according to economic criteria of efficiency. It may further lead to a speculative determination of contracted volumes (gaming). Independently of how distribution of excess demand is chosen, there is a question about who will decide how large the actual capacity is. If it resides with the pipeline company, it may downgrade capacity in order to exploit demand inelasticity and exercise monopoly power against shippers.

3. A third question is *how to price new transport capacity* The question about building new capacity arises when there is excess demand relative to capacity. At some point demand will be large “enough” to extend capacity according to the criterion chosen. If the pipeline company on average is to maintain a tariff covering costs in an existing network, such an average price will normally not cover the costs of building a new pipeline. A new pipeline implies an investment with newer and more expensive capital relative to the existing depreciated pipeline. The average cost for the new pipeline company will usually exceed, or at least be different, to the old one.

One way to solve this problem is to include, or “roll-in”, the cost of the new pipeline in the tariffs for all transportation. A new average cost, which covers both the old and the new pipeline, will be established. The price paid for such an arrangement will not reflect the actual cost in every pipeline. Some costs will exceed and some will be below the average tariff. Another way is to evaluate every pipeline project independently. In this case the new pipeline will operate

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<sup>79</sup> See e.g. Hogan (1989).

with higher costs than the old one, and the users of the new pipeline will have to pay a higher tariff than the users of the existing pipeline. Even if the latter system in principle meets the demand for economic efficiency in a more satisfactory manner (a new pipeline will not be built before the customers are willing to pay for its full costs), the old system gives the pipeline companies reason to expand capacity faster.

Another question is how large should capacity actually *be*. A new, large gas contract may justify a new pipeline project by itself. A marginal contract will not be able to do so. On the other hand, many marginal contracts combined will make this possible. Corrected for uncertainty, a new pipeline project should give a positive net present value at a suitable discount rate. With society often having low discount rates relative to the private sector, a project may be profitable for society, even if it is not profitable for the private sector. If a new pipeline is subsidized, the volume requirements are lowered and the construction is correspondingly advanced in time. A system where the pipeline companies may roll-in the costs of a new pipeline in the existing system might on the other hand, lead to over-investment in transmission systems.

4. A fourth aspect is how good or bad is *the alternatives to regulation*. In parts of the market, there may already be enough competition for it to operate so well that the costs of a regulatory regime will be higher than its benefits. Perhaps, competition and unbundling would be a better alternative on certain distances. In particular, alternative pipelines with new owners within geographic areas of strategic importance might be better if regulation and the resistance against them turn out to be too costly. Competition has the advantage that one does not have to have the same degree of control and follow-up for the myriad of necessary details under a regulated system. As shown, competitive encouragement represents a way of increasing efficiency. But, it will only be useful if demand for transportation is large. It will be the position of the demand curve relative to cost curves that determines whether economics of scale affects the market structure in a way that makes it a viable proposition, cf. Chapter 5.5.1.

5. In market theory, the *property rights* of an industry are often considered given. On this basis the forces that determine price and quantity are discussed. But a pipeline company acts as a monopsonist (as gas buyer) and monopolist (as gas seller) because its owners are intent on maximizing the profits of the pipeline company. By changing the property rights of owners to goals other than maximizing the profits of the pipeline company, different results can be attained. If the owner has social efficiency as a goal, profit maximization may not be the best or only goal. Alternative property right structures may be government ownership, or that distributors and/or producers owns the transmission companies with a share, which is so small that they do not want their profit to accumulate in the transmission sector. The Gassled system on the NCS takes account of this aspect, cf. Chapter 3.4, and gives producing companies a share in the transportation network similar to their overall share in producing fields.

One way to change property rights is to nationalize the firm by changing its ownership from private to public. In Europe, this was a common way of approaching the problem for a wide range of branches after WWII. The idea has been that the problems of monopoly power, externalities, inequality etc. can be dealt with directly if such companies are run with social welfare as the goal, rather than private profit. Nationalization has been supported, both on ideological grounds and because of the market failures created by natural monopolies. In Europe, labor parties have historically favored nationalization, with the argument that the ownership of means of production, distribution and exchange should be common when firms serve as public utilities. However, there has been considerable debate through-out the twentieth century on how much of a nation's industry should be under public ownership, and how much should be managed through market mechanisms (as in the "Austrian school").

One major argument for the privatization of publicly owned enterprises over the past 20 years has been their relatively poor economic performance. Obviously, to run a deficit, and not with a profit, is a non-valid argument. The nationalized industry *should* in many cases run a loss if prices are set equal to marginal costs and average costs are falling, as discussed in Figure 5.12. Therefore, the assessments of nationalized industries should be undertaken on

the basis of its costs and its quality of service, rather than upon its profit. Moreover, such comparisons are rather difficult<sup>80</sup>, especially for natural monopolies without competitors, and it is difficult to observe such differences with certainty before they become rather significant.

Another argument in favor of privatization has been that private firms will be more exposed to market forces than their public counterparts. Privatization should improve efficiency, reduce costs, and improve quality and lead to greater responsiveness to the wishes of the consumer. However, if a publicly owned firm is privatized in a non-competitive market, a private monopolist should not have little reason to behave more efficiently than the public one. Thus, in most such cases, privatization must be followed by some sort of regulation if efficiency is to be improved. Ownership may be only one determinant for the efficiency in an industry, while the degree of competition is another. Also public enterprises can be more efficient if they face competition.

Whether publicly or privately owned and run, transporters in the (non-competitive) European gas market must be followed closely by public authorities. Under whatever approach, they will need independent regulatory competence and power to decide on a number of issues that arise. The NGF has been partly developed by such a competence in the MPE and NPD. An industry may show lax efforts to improve if their government always is ready to improve their situations when they encounter difficulties. Tough hands are often needed to determine the amount of, and the way help is given, along with how regulations are enforced, including incentive-type regulations. Thus, the authority's attitude, competence and political standing may in many situations be as important as the principles to which it adheres.

6. A sixth aspect is that *market conditions change* over time. A politically controlled liberalization process must contain a dynamics in order to change optimally over time. Strong economic interests in companies that are included in the process mobilize strong resistance against changes that affect their profits. The development in the American gas market is a case in point.

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<sup>80</sup> See for example Meyer (1975).

7. European gas trade is *international*, where there may be conflicts of interest between EU countries, cf. Chapter 5.2, but particularly between EU countries and exporting countries external to the EU, cf. Chapter 5.3, about the distribution of economic rent in the market. The fact that the European gas market is international, even if the EU were to develop into some sort of a federal state structure in line with neo-functionalist views, means that it will remain politicized in the foreseeable future. Regulation of intra-EU transportation should consider the effects on and behavior of outside producers. This is a stated reason by the EU for maintaining the market as partially uncompetitive (EU 2005a:18).

Taken together, the regulation of transportation infrastructure is highly important, but at the same time, difficult with respect to EU's desire to intervene and achieve a more open and flexible market for natural gas. The combined challenges emanating from the economics of a natural monopoly, conflicting interests between regulator and those regulated, as well as differences across member countries and external suppliers, are constraints to efficient regulation of the transportation segments in the EU gas market. The political regulations and interventions chosen or not chosen, are therefore of the greatest importance for the maneuvering room for the natural gas entrepreneur, cf. Chapter 5.5.7.

### **5.5.6 Regulatory experiences from the U.S. and the U.K.**

As the deregulation of U.S. gas market and the liberalization of the British gas sector were forerunners and contributed to EU gas market liberalization, some of their experiences are outlined below. In the discussions at the end of this chapter (Chapter 5.6), common and diverging features between these two gas markets and the EU gas market are identified and contrasted. And thereafter used to discuss hitherto and future EU natural gas market developments, together with the four constraints to full market liberalization focused in this chapter.

#### **5.5.6.1 The United States**

The history of the North American gas market is much longer than that of Europe. Gas has, in fact, been used since the first half of the nineteenth century. From the mid-1920s trade expanded and consuming areas with no gas were

connected to production areas on a larger scale. The pipeline companies bought gas at the wellhead at low prices, and sold it at a significant mark-up at the city gates to local distribution companies. They sometimes even refused to service customers if they sought some control over the rates charged. Until 1938, the courts could not deal with the excessive pricing practices that existed on the grounds that state authorities had no jurisdiction over commerce between states (inter-state trade), only over trade within their own state (intra-state trade).

The Natural Gas Act (NGA), passed unanimously by Congress in 1938, created the Federal Power Commission (FPC) to control inter-state commerce in natural gas. Across state lines the FPC set the gas rate of return for private carriage (cf. Footnote 52 for definition) resale to local distribution companies (city gate prices) at a "just and reasonable" level. It was specified that the conditions they offered one company would have to be offered to others on a non-discriminatory basis. While the FPC could approve that pipelines could transport gas owned by others, or "contract carriage", the NGA did not prescribe that they *should* exclusively do so. The pipelines were not obliged to provide transmission access to all customers on a common carrier basis, even if this was a

*"clear intention of Congress in framing the NGA" (Broadman 1987:127).*

Furthermore, pipelines were still free to negotiate sale prices directly with large end-users. The setting of "reasonable" rates of return for the pipelines was largely a result of bargaining between the companies involved and the Commission (Davies 1984:Ch.4). This situation seems to have limited extreme profit taking by the pipelines, but nevertheless, it may have produced rates that were well above the rates of return on equity for alternative investments (normal profit).

The FPC was a regulatory agency, and as such it possessed the right to amend its regulations in accordance with the NGA. The amendments made were, however, subject to appeal by any party to a U.S. court, which could block them. Thus, the discussions between the Congress, the courts, the FPC and the industry over the extent of FPC jurisdiction remained controversial for more than 15 years after the NGA was passed. Finally, in 1954, the Supreme Court, in the Phillips Decision, stated that the FPC had jurisdiction over

*"the rates of all wholesalers of natural gas in interstate commerce whether by a pipeline company or not and whether occurring before, during, or after transmission by an interstate pipeline company" (Phillips Petroleum Co. vs. the State of Wisconsin, 347 U.S. 672 (1954)).*

The Phillips decision extended FPC jurisdiction to the wellhead, such that producers' wellhead prices could be set. However, it still only regulated inter-state trade, leaving intra-state gas free of federal control of wellhead and pipeline prices.

The main economic problem that gradually became apparent was that prices set at the wellhead were based upon costs in fields in production, or even in decline ("old gas"). The price did not take account the marginal cost of the discovery and production of new developments ("new gas"), which were higher than for old gas. However, as energy markets remained reasonably stable for the following 15 years after the Phillips-decision, the arrangements established gas prices for interstate trade close to the prices determined in the non-regulated intra-state gas market. During this period, large reserves were added as a result of findings of associated gas together with major oil discoveries. Also the pipeline grid expanded substantially.

Increased demand for gas, and, in particular, the quadrupling of oil prices in 1973-74 raised gas prices substantially in intra-state markets. However, as prices in the intra-state market could respond to the increased demand and prices and the inter-state could not, the two-tier price system gave incentives to producers to dedicate supplies to the intra-state market. This created shortages in inter-state trade. These shortages forced a number of gas consumers to shift to alternative and more expensive fuels. For example, the third-ranked natural gas producing state, Oklahoma, was a major supplier of inter-state pipelines before the oil shock. But in the period 1972-77 more than 85 percent of newly discovered gas was dedicated to the intra-state market at higher prices (Davies 1984:83).

This untenable situation was addressed when the FPC was replaced by the Economic Regulatory Administration (ERA) and the FERC in 1978. FERC was to handle most cases involving the U.S. natural gas industry, and the ERA was to have jurisdiction over natural gas imports. These responsibilities were defined in the

Natural Gas Policy Act (NGPA), which began the "deregulation" of the American gas industry (Haase 1979).

The NGPA brought intra- and inter-state markets under the same regulations and thus established a single national U.S. market. This stimulated natural gas exploration and development. The NGPA deregulation also reduced the need for pipelines to obtain regulatory approval for contract carriage. In 1983, under Special Market Programs (SMPs), pipelines were allowed to devise discount prices for "direct sales" to *industrial* end users. In many industrial markets this led to market clearing prices, which during the 1980s dropped significantly below those of alternative fuels. Prices dropped due to oversupply of gas caused by higher energy prices after the tripling of oil prices in 1979-81. The high prices provided incentives for conservation. Moreover, with the economic crisis that followed the oil shock lead to a fall in demand for gas. The SMPs regained customers who had switched away from gas during the 1970s.

The SMP arrangements also forced pipelines to engage in a greater amount of contract carriage, increasing the share of contract carriage in inter-state gas trade from 24 percent in 1978 to 37 percent in 1984. However, the increased contract carriage was mainly on behalf of other pipelines (84 percent of the growth). The interconnection between pipelines developed on a "sounder" economic basis as a result of the SMP arrangements. Still, however, private carriage, where pipelines bought gas at the wellhead and sold it at the city-gate, dominated the transmission sector.

In 1985, the volume transported for others through the inter-state system represented some 50 percent of the total. However, many of the LDCs that were able to obtain cheap gas contracts with producers could still be denied access to the pipelines. SMPs discriminated against residential users, and as a result the courts and FERC terminated the arrangement in October 1985. Under Order 436 they stipulated that a pipeline company providing a contract carriage service to one customer must do so to others on a non-discriminatory Open Access basis. Furthermore, if a pipeline wanted to engage in contract carriage, all of their customers could, over some years, completely transfer their private carriage to contract carriage service.

*“Once gas pipelines were given the option of ‘open access’, the barriers to markets and competition dissolved” (De Vany and Walls 1995).*

However, due to the oversupply in the market (the "gas-bubble", cf. Chapter 4.4.2), many pipelines suffered from take-or-pay contracts with producers. On this basis, the Appeals Court found that a take-or-pay policy in Order 436 was inadequate. In response to this decision, FERC issued Order 500 in 1987. With this decision Open Access pipelines were allowed to share 50 percent of their take-or-pay costs with their customers.<sup>81</sup> Many pipelines applied for such certification and the number of contract carriage transactions increased further.

The terms set for providing contract services were determined by allocating fixed and variable costs, respectively, to customers on the basis of a two-part tariff (access/usage tariff, cf. Chapter 5.5.5). The demand charge represented the maximum daily volume of gas that a pipeline customer was entitled to purchase at any time during the year. The commodity charge represented the actual volume of gas purchased. All variable costs were incorporated into the commodity charge, but different rate-designs were used to allocate fixed costs. The volumetric method, where the commodity charge reflected all fixed costs, occupied one extreme, while at the other extreme there was the fixed-variable method, where all fixed costs were incorporated in the demand charge. In most situations, the FERC employed an intermediate rate design.

The FERC also had jurisdiction over abandonment - the termination of a pipeline's statutory service. A pipeline could not, in most cases, terminate a service to a customer unless approval had been obtained from the by FERC, even if the contract had expired. Exceptions could be made if a pipeline received a blanket authorization for contract carriage, and on "off-system" sales were permitted if they did not harm on-system customers and were on an interruptible basis or an inter-pipeline contract.

However, new regulations caused new problems. The pipeline companies could still refuse to sell gas and provide transportation capacity even if they were obliged to do so if they had excess capacity. Therefore, the customer in many cases did not

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<sup>81</sup> In between these orders, order 451 was issued, allowing renegotiation of old gas contracts to reflect current market situation. However, order 451 was never implemented.

have the choice to substitute contract carriage for private carriage. The decision to some extent still resided with pipeline companies. The entry and exit requirements in and out of contracts caused in addition institutional barriers to inter-pipeline competition. At the same time, however, competition between pipelines increased and reduced some of the regulatory needs.

The FERC's Order 636 in 1992 more strongly altered the regulatory and operational environment of the natural gas industry. It intended to further competition by requiring that independent companies should separately arrange transportation and storage, cf. Chapter 4.4.2. Finnoff, Cramer and Shaffer (2004:243) find it as the culmination of several directives aimed at relaxing regulation and fostering competition:

*"We hypothesize that gas pipeline firms subsequently changed their operational and financial behavior in ways consistent with reduced balkanization, increased competition, and reduced expense preference behavior. Our results indicate that these firms have become more homogeneous financially but less so operationally. We find evidence that the marginal profitability of various pipeline activities has responded more to financial market conditions than to the regulatory environment"*

Because of weak energy markets and oversupply of gas, prices stayed low during the 1990s. However, the gas bubble eventually disappeared, with tight markets and high prices resulting, cf. Chapter 4.4.2. Again regulations proved to have different effects in the short- and the long-term.

Castaneda and Smith (2003) in their study of Panhandle Eastern's history follow the relationship between regulatory policy and the modern corporation in the twentieth century. Entrepreneurs competed, first, in an unregulated industry through the exercise of unrestrained corporate muscle, then as it became increasingly regulated and profitable, and finally in the era of business reorganization and deregulation when regulators changed the structure of the pipeline industry to provide evidence of the "dysfunctionality of federal energy regulation". MacAvoy (2000) discusses how natural gas for forty years came from various producing basins and arrived at the city gate priced at levels controlled at the wellhead, then again at the city gate, with uncertainty whether net benefits were positive or not over time:

*“Such regulatory practices produced first shortages and then excess supply, partial price deregulation was put in place, which gradually ended price controls at the wellhead as well as controls on some rates for transportation. In effect, gas was unbundled from transportation, at each level, by new regulatory actions. It is to be determined whether there were gains or losses to consumers, producers, or distributors at each stage” (ibid:17).*

However, in spite of shortages and high prices after the turn of the century, the microeconomic regulatory principles continued to be followed and also furthered. The Energy Policy Act of 2005 (Pub.L. 109-058) expanded FERC’s authority to impose mandatory reliability standards on the bulk transmission system and to impose penalties on entities that manipulated the electricity and natural gas markets. As a regulatory agency, FERC is independent of the Department of Energy (DOE), but DOE may intervene just like any other party in FERC proceedings. FERC activities

*“shall not be subject to further view by the Secretary (of Energy) or any officer or employee of the Department “ (42 U.S.C. § 7172g).*

However, as in the U.K. (below), the U.S. system implies that the government should not have the capacity to directly control energy markets. Regulation is carried out by the FERC, and energy policy is largely limited to influencing the operation of the market.<sup>82</sup> Only in 2007, U.S. energy policy seems to have started on its way to be somewhat more politicized again (Bush 2007). This coincided in time with similar, but much stronger, efforts by the EU (EU 2007a).

### **5.5.6.2 The United Kingdom**

In the U.K., BG was created as a state owned company with the Gas Act of 1972. BG was formed with the merger of 12 area gas boards, established after the nationalization by Clement Attlee’s labor government under the Gas Act of 1948. The area boards became regions of the new company. The UK converted from town gas with the rapidly growing North Sea natural gas during the 1960s. BG had close to complete control of the entire gas chain in the U.K. from 1972 and up

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<sup>82</sup> FERC homepages ([www.ferc.gov](http://www.ferc.gov)) provide *inter alia* brief historical and updated overview over U.S. regulatory history.

to the mid 1980s, with exclusive rights over transmission, distribution and retailing of gas. BG was also a sizeable producer, in addition to aggregating and purchasing all production (from a large number of producers) on the British continental shelf (Williams 1981). The market was divided into a "tariff market" (mainly the residential and commercial market) and a "contract market" (mainly industrial customers).

U.K. gas production started in the 1960s but peaked already in the 1970s. The British gas market expanded considerably in the 1970s and 1980s. The rapid growth was dependent on imports from Norway. To continue expansion, the U.K. needed to increase exports beyond the Frigg contract from 1973. After dropping out of the Statfjord gas negotiations at an early stage, concentration was put on the Sleipner Field. The British department of energy discussed the plan with her Norwegian political counterpart (MPE), but the plan was eventually turned down by the British government in February 1985, cf. Chapter 2.3. The intervening government of Margaret Thatcher showed a strong commitment to free market principles, which became also main driving force for European gas market liberalization in the 1990s.

Already with the Oil and Gas Enterprise Act of 1982 sales of gas to end-users by others than BG was allowed, but these had no access to the BG gas grid. BG was however privatized with the 1986 Gas Act and launched on the London stock exchange. Amendments to the Gas Act gave the simultaneously created Office of Gas Supply (OFGAS) responsibility of ensuring that effective competition was established in the contract market. The act defined the terms by which parties could transport gas through the BG grid, but new actors did not enter the market to any significant degree. More steps had to be taken. The Monopolies and Mergers Commission (MMC) stated in 1988 that BG did not provide adequate information of cost on third party transportation and that it was able to discriminate between customers because of its market dominance. BG was requested to publish more information about their charges, how they were calculated and to unbundle the operations of transportation and marketing/purchasing. Furthermore, in 1990, OFGAS initiated a 20 to 40 per cent reduction in transportation tariffs (Barnett 1995).

BG was however, when privatized, not split up into separate business units and remained as a de facto monopolist in the market.<sup>83</sup>

*“Despite a number of criticism (..), the government sold the industry intact and with very light regulation” (Price 1994:137)*

The liberalization of the production of electricity became particularly important for gas market liberalization. In 1989 the Central Electricity Generating Board (CEGB) was privatized and divided in two. The company National Power was to take care of local distribution through regional electricity companies, while power generation (except nuclear power) was to be handled by PowerGen. The transmission company, National Grid, was to ensure that supply and demand was kept in balance at all times through a “pool”. While BG at first was only privatized, without any significant changes in the market stemming from it, the electricity industry was split into production, transmission, distribution and sale from the start.

Through the liberalization of the electricity industry, power manufacturers began to build combined-cycle turbines that used gas as an input factor. As long as BG no longer had a purchasing monopoly on produced gas, the gas producers could sell to this new part of the power industry, where they might also charge higher prices. At the same time, producers began selling directly to large industrial users, where they could undercut the regulated prices of BG. Into the 1990s, relatively short-term agreements between producers and buyers were developed, and the spot market that was created began to affect long-term prices. Shippers and suppliers that had purchased long-term TOP contracts encountered serious losses and experienced financial problems when gas prices dropped in 1995 (Stern 1998). Generally low energy prices and the liberalization of the market transformed the market into a more risky and unstable business in the mid 1990s, as compared to the early 1990s and before.

In 1996 the International Petroleum Exchange published a forward contract, and trade in gas futures contracts began. Many market actors and electricity producers now purchased gas directly from producers. But BG competitors

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<sup>83</sup> See Helm (2003) for a comprehensive discussion about British energy policy since 1979.

maintained that the market still did not offer a satisfactory degree of competition. MMC recommended in 1993 that BG transport and broker functions should be completely separated by 1997, the threshold for monopoly supply to tariff customers should be reduced, and the feedback rate when calculating the prices of the transmission companies should correspond to 6.5 to 7.7 per cent on new investments.

BG finally demerged into Centrica in 1997. Centrica plc became the trading name for BG in the UK, while BG plc continued outside Great Britain. In 1998, the whole British gas industry was opened for competition, and BG also spun off its transmission and distribution activities to Transco. BG plc maintained ownership of Transco. Transco demerged from the BG Group in 2000 and became part of the Lattice Group plc. As a consequence of the processes, independent gas suppliers gained large shares of the domestic consumer market.

In 1993, the building of the Interconnector between Bacton and Zeebrügge began, which was to tie Continental and British markets together.

*“The Interconnector pipeline was born out of a British government initiative to provide an outlet for excess gas produced from the UK Continental Shelf to provide a floor under UK gas prices in the wake of the national gas industry privatisation and liberalisation” (Futyán 2006:45)*

The first gas was sent through the system in October 1998. Through Interconnector, the liberalization of the British market directly started to influence developments elsewhere in Europe, as gas could be sent through the system, both to and from Great Britain.

*“It is now clear that the Interconnector serves primarily as a trading, not a bulk transportation, facility.” “Despite limited competition in European markets and inflexibility of supplies, the Interconnector has still had an impact on mainland European markets.” (ibid.)*

Zeebrügge developed into a significant hub for buying and selling of gas, not least the short-term agreements. The connection between the British and Continental markets contributed to a gradual converging of prices in the two markets, cf. Table 4.1.

At present, the Office of Gas and Electricity Markets (OFGEM) working for the Gas and Electricity Markets Authority (GEMA) is the government regulator for the electricity and downstream natural gas markets. It was formed by the merger of the Office of Electricity Regulation (OFFER) and OFGAS. Its main powers derive from the Gas Act 1986, the Electricity Act 1989, the Competition Act 1998, the Utilities Act 2000, the Enterprise Act 2002 and the Energy Act 2004 ([en.wikipedia.org](http://en.wikipedia.org)). The system implies that the government, as in the U.S., no longer has the ability to directly control energy markets. Regulation is carried out through OFGEM, while energy policy is largely limited to influencing the operation of the market. Such influence is exerted through taxation, subsidy, incentives, planning controls, market entry restrictions (for example the costs associated with connecting to the National Grid), the underwriting of liabilities, grants, and funding research.

Eventually, the liberalization of the British market resulted closer to a textbook design, more so than achieved by the EU to date. Only in 2007 did the U.K. again start to import gas from Norway (Ormen Lange gas to Easington) and she is discussing future imports from Russia. She has consequently solved her own scarcity problems hitherto with the imports from Norway and has not met the political difficulties faced by the EU in connection with transit countries and dependency on Russian gas. The regulatory framework seems to work for the industry. The future will reveal what changes that may come when she eventually becomes dependent on imports also from countries other than Norway.

### **5.5.7 Regulatory constraints and the political entrepreneur**

The varying degrees of scale and scope advantages in different segments of the European gas market make it difficult for a regulator to find an optimal portfolio of competition, tariff structure and unbundling. The questions raised in the discussions of regulatory economics illustrate that it is reasonably easy to argue both for and against most solutions when determining tariffs, transport capacity, property rights and evolution of the market. From the outset the goal is largely to reach second or third-best solutions, or worse. Regulators easily become “captured” by the regulated and other affected parties.

In light of the intra-EU problems to agree about supranational regulations in the energy sector, cf. Chapter 5.2, it appears rather doubtful, according to this perspective that she will manage to set up a regulator at the EU level which *de facto* and efficiently harmonizes transportation tariffs and practices across the Union (EU 2007b). More likely, however, is that she can do it *de jure*. This is what Andersen and Sitter (2009) call “fuzzy liberalization”, cf. Chapter 3.6.

Regulations of the TSOs to behave only as transporting companies would however, add to market flexibility. This underlines that the Norwegian political natural gas entrepreneur also from this perspective have needed to gradually become more concerned with downstream market terms and prices, and political regulations and interventions, than with relations to single purchasing companies and countries, as in the first two stages of market evolution, cf. Chapter 4.1. The maneuvering room for political entrepreneurship when exporting natural gas to the EU can be assumed larger the more imperfect are EU markets and its politics, compared to an idealized competitive market and regulatory design.

Discovering these imperfections represents an essence of entrepreneurship (Morse and Mitchell 2006). When imperfections occur, due to market imbalances or the absence of or insufficient political regulations and interventions, the political natural gas entrepreneur will seek to exploit opportunities. The focus is upon influencing downstream regulations to suit the best interests of Norway, while at the same time adapt to regulations in a most favorable way on the NCS. Losses can also be greater if he passively adapts to other actors’ actions, which also have greater maneuvering room in such situations. Downstream companies and other countries should also be expected to influence terms of operation on the NCS when possible, albeit not necessarily in the direction of Norwegian interests.

## **5.6 Limits to market liberalization and the natural gas entrepreneurship**

Chapter 4.4 demonstrated that a more liberal market leads to more price volatility as gas prices do not only react to changes in prices on alternative fuels anymore, but also reflect the balance between demand for and supply of gas. Producers will in the short and medium term (which may be many years) benefit from

market liberalization when markets are tight and face losses when they are weak. A more liberal market also leads gas contracts to become more pluralistic and short-term, as outlined in Chapter 4.5. The faster and stronger the market responds to a change in supply and demand, the faster the portfolio of long-term, short-term and spot contracts changes. In weak market situations the TOP problems experienced both in the U.K. and the U.S. could be repeated in Europe. However, as long as we face generally tight energy markets in Europe and elsewhere, TOP problems will not become significant in the EU gas market. The effects of market liberalization were found to be quite different in tight as opposed to weak market situations, as well as in the short as opposed to the long-term.

The consequence for Norwegian gas exporters of increased price volatility and more short-term contracts was discussed as a necessity to have a more flexible way of selling gas than under the old and rather rigid GFU system. The need to integrate down-stream also increases; firstly, to be able to reap the full benefit of market openings and the sale to new and old, smaller and more diversified customers; secondly, to open for the opportunity of reaping profit from larger parts of the gas chain than just on the NCS and balancing revenues when market conditions and rent distribution change; and; thirdly, to control a market outlet for her gas, and especially prepare for when markets eventually once again become weak. StatoilHydro has already invested downstream for example in Germany, and German companies have become more active on the NCS. Market openings have created more opportunities. Gazprom has however, acted much more aggressively, without permitting the EU or other relevant countries' companies to invest in the Russian petroleum industry.

*"The liberalization of the EU's natural gas market has a direct influence on Gazprom's behavior" (Locatelli 2007).*

The effect on the political entrepreneurship from market liberalization was that it should be made in a more regulative than in an interventionist style. The state can however increase its own direct participation to defend national interests under liberalization, as discussed in Chapter 3.5-6. The state can also encourage companies where it has an ownership majority (such as in StatoilHydro) to behave in the interests of the state (within the liberal market

framework), and through political channels it can help companies establish themselves downstream. The “package” of policy options introduced in Chapter 3 and 4 were found to be greater than just adhering to EU rules and regulations as a text-book, even though more transactions would be made by independent market actors.

The European gas market via the second stage, has gradually reached elements of the third stage over the past 20 years. However, while parts of the market can be considered mature, other parts are still immature in spatial terms, as well as in terms of market expansion. This is especially the case when the expansion of natural gas has to be met by production from increasingly more remote fields outside the direct political sphere of the EU, cf. Figure 5.2. Constraints are also linked to intra-EU affairs, the non-renewable nature of natural gas, and regulatory challenges. This chapter has argued that to fully reach the third stage of development in the expansion of the European market environment is an intriguing affair. The EU gas market will in the foreseeable future in all probability remain politicized and imperfect, albeit more open and flexible than in the past.

The by-definition scarce character of natural gas resources is strangely enough not found to be explicitly addressed as a special constraint for long-term supply in EU documents. Nevertheless, resource constraints *over time*, which may also be decades, remain important for how successful liberalization processes of any gas market will be. This is, *inter alia*, why a special branch of economics for non-renewable resources has been developed. In the EU, however, discussions focus on the framework of contestable markets for general products and services and how to deal with non-competitive aspects of them. Even if an European (and not only an EU) regulatory authority was set up, and foreign policy aspects were abolished as a problem, the exhaustible character of the resource would still challenge competition principles taken from general microeconomic theory in the long-run and / or in the short-run, depending on what kind of economic implications the scarcity shall be considered to inhibit, cf. the discussion in the beginning of Chapter 5.4.

In addition to addressing the challenges created from the non-renewable nature of natural gas, a discussion of EU liberalization processes must be kept

within the context of the European market and political reality. A most striking difference between the European and U.S. gas markets is that in Europe, there is strong concentration around a few firms at most levels and segments of the market, while in the U.S. there are thousands of producers and a well developed market infrastructure. In the UK there are also many producers. Supply structures are more similar in the U.S. and the U.K., as compared to the Continental European gas market.

There are also political differences: Both the U.S. and U.K. governments had jurisdiction largely over their entire gas chains when deregulated / liberalized. The role of the EU Commission with respect to intervening in the market may parallel the U.S. federal government's role in regulating inter-state trade before 1938. Only after 1938 did the federation take control over market regulations across the country (although with many regulatory impediments to be experienced over long time, as discussed in Chapter 5.5.6.1). Also in the U.K., one government takes responsibility for all parts of market regulation.<sup>84</sup>

The international aspects of the market indicate a need for the EU and EU countries to further external measures and dialogues with producing countries, in order to balance elements of conflicting interests in how producing countries behave and how the EU organizes her markets, and hence contribute to an improvement in both long-term supply and demand security.

*“In order to provide a comprehensive picture on the relationship between Russia and the EU, the focus should be on both the external energy relationship as well as Russia's internal organization” (Spanjer 2007).*

EU (2007a) argues that the Union should speak with one “coherent and credible” voice in (such) external affairs, acknowledging that the EU cannot achieve its energy and environmental objectives on its own. The EU is however, mainly a confederation with sovereign member states and has to date not introduced comprehensive supranational regulation of the sector, and instead degrees of harmonized policies exist. Consequently, a supra-national regulator,

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<sup>84</sup> Their situations are however gradually changing as both increasingly depend on more imports.

corresponding to the FERC in the United States or OFGEM in the U.K., is this far not found in the EU.

*“The UK power and gas markets are the most competitive in Europe. Market conditions, attitudes towards liberalization, and levels of competition remain highly diverse across the EU. The EU aim at creating a single European energy market remains a distant possibility rather than an immediate reality” (Energy Business Review June 21, 2007).*

Hence an open question can be posed: to what extent it will the EU or EU countries deal with the external issues, as well as the internal ones? Intra-EU political debates make supranational EU decisions more difficult to achieve. Benefits and costs, opportunities and obstacles, vary with the status of individual markets and political situations. Not supporting common actions involves costs for member states. Policies may continue to be harmonized, but national and commercial actors and actions will most likely remain important.

Lessons from in particular the U.S. regulatory history also underline EU regulatory challenges. In the U.S., regulatory steps at one point in time laid the ground for other problems at a later point in time. An optimal natural monopoly regulation should lead to consistency between the company's desire to maximize profits and the society's desire for maximizing welfare, as in a perfectly competitive market. This is the core of regulatory economics (Train 1991:3). The by-nature non-competitive structure of natural gas transportation activities challenge all natural monopoly regulators, as they usually must aim at second or third-best outcomes compared to microeconomic efficiency criteria when tariffs are to equal average cost (ibid:115). Ellig and Kalt (1996) apply economic theories of contestable markets, public choice, transaction costs and dynamic entrepreneurship to help regulators and industry leaders better understand these challenges. Regulations, as a consequence, should be formulated with a consciousness of how market frameworks and mechanisms may *evolve*. More than 50 years after the first regulations were passed Congress in 1938, the U.S. gas market still suffered from undesired inequities.

It is worth noting that the choice to do nothing (Austrian school approach) was considered the worst solution in the U.S. as in the U.K. Few suggested that

the situation that existed before the NGA was implemented in 1938 in the U.S. was better than the more or less regulated situations afterwards. U.K. experiences are much shorter than those in America, but in her first phase of market regulations and privatization she needed a decade to implement policies that *de facto* fully privatized BG and opened the market. Giving monopoly power back to BG has however not been considered an option during the process. It similarly does not seem likely that the EU will advocate significant reversals in her liberalization processes initiated by the gas directives. Rather, efforts will be made to repair for market and political impediments.

The partial immaturity of the European gas market also differs from the U.K. and U.S. experiences during deregulation / liberalization. When markets are immature the effects from a straight-forward liberalization process can distort necessary evolutionary processes as maturation takes place (Correljé, van der Linde, Tönjes and de Jong 2006:47). Full liberalization of an immature market can have long-term negative effects on supply and demand security for importing and exporting countries, due to the huge long-term investments necessary in both up and downstream activities. The deputy chairman of Gazprom even claimed that EU natural gas market liberalization may

*"disrupt the entire system of gas security in the region" (Medvedev 2006).*

Stern (2001) also argues that leaving the TOP contracts and the long-term character of the relationships in the market is a particular problem when markets are immature. On the other hand, when markets are mature, liberalization provides more efficient solutions to inter alia security-of-supply problems.

*"Traditional arguments were more convincing at an early stage of market development; now sound more like reluctance to take risk and defense of monopoly/monopsony positions" (Stern 2005).*

Accordingly, some projects need exemptions from the second gas directive (EU 2003a) under Article 22 and enter into long-term contracts, while others do not. Stern (2005) compares two large new projects in North Europe: Ormen Lange from Nyhamna in Norway to Easington in Britain, and the German-Russian Nord Stream project from Vyborg near St. Petersburg to Greifswald in Germany, and finds them in largely different situations.

Ormen Lange supply contracts sell into the largest, liquid market in Europe. The UK market is running short of gas and will need substantial new supplies. This is combined with the fact that most equity holders have market operations in the UK and customers on the Continent which give them arbitrage possibilities and will make Ormen Lange one of the lowest cost sources of gas in the UK. The Norwegian offshore regime is well established and in Ormen Lange investors should be relaxed about the project, Stern concludes.

*“A fully liberalized UK market does not seem to deter very large investment projects, even when the profitability of some projects may be questionable given anticipated market conditions” (Honore and Stern 2005).*

On the other hand, the Nord Stream project is considered by Stern (2005) to be a virgin project which cannot be built in stages, with high costs and few markets along the route. It will need to be legally unbundled, with long-term capacity contracts and purchase contracts. There is a significant risk when selling high cost gas into a liberalized market.

The principles of competition are gradually challenged due to the high energy prices, and this comes to be expressed as an element of interest conflict between outside producers and the EU. At the same time as desires for a common energy policy are put forward, the EU sees it for example, as beneficial that large companies in the energy sector maintain a strong buying power, even if excessive market power in certain regions is the result and can limit the benefit of and possibility for competition (EU 2005a:18). Even though the possibility of creating a single buyer on the EU side to exploit her monopsonistic market position to counteract exporters' market power is discussed (Finon and Locatelli 2007:24-28). The political economy of European gas clearly indicates that

*“... what is economics for one actor in a market might be politics for another” (Claes 2001:368).*

Max Weber's classic definition of power (1978) accentuates the likelihood that individuals or groups will get their way in a relationship based on opposing interests or conflict. From such a perspective, material resources and formal positions will be central to the analysis, while the framework for exercising such power will usually include built-in imbalances in generally accepted norms,

concepts and authoritative knowledge. It is generally accepted that economic processes have a dimension of power and democracy. Weber discussed this within the framework of the nation state:

*“Processes of economic development are in the final analysis also power struggles, and the ultimate and decisive interest at whose service economic policy must place itself are the interests of national power” (Austvik and Andersen 2001).*

Taken together, more pipeline routes, LNG supply and terminals, storage facilities and the possibility of open market transactions improve the security-of-supply and security-of-demand situations, albeit with the interdependence between EU and supplying nations of natural gas, it cannot be completely of a neutral kind in the foreseeable future. Competition, if achieved, creates some problems upstream affecting EU supplies in the long-run, unless arrangements are found to secure long-term investments. Competition in and the increased privatization of Russian gas activities could for example, improve the EU supply situation in the short-run, but deteriorate it in the long-run. Prices could be pressed downwards, resources exhausted faster and a greater dependence on Russian gas would result. In the long-run, downstream market efficiency measures must in the EU be complemented by energy efficiency improvements, along with the phasing in of renewable energy sources to avoid shortages from non-renewable sources becoming an economic and political problem, cf. Chapter 5.4. Only after many years of high prices are such comprehensive area-interlinked policies under consideration (EU 2007a).

The situation supports the assumption that a liberalized market for non-renewable internationally traded European natural gas should be considered and designed in a somewhat different manner to non-competitive markets for renewable goods and services. A less orthodox, modified and more flexible design of a liberal EU natural gas market than a simple text-book competition policy for general goods and services, may improve the possibility of reaching common decisions at the EU level.

The need for entrepreneurial actions on both Norwegian and EU political levels are expected to persist within this imperfect commercial and political framework. The NGF needs not only proper domestic organization, but also proper

downstream market organization, and an updated and active policy in both Norway and the EU. It will be important for Norway to emphasize the long-term character of the industry towards EU policy makers, while at the same time positioning herself in relation to national governments in purchasing countries and through up and downstream intra-industrial alliances. Industrial alliances have for long time been made between Statoil and Hydro and downstream gas companies through their long-term cooperation and contracts and reciprocal bindings. In line with the two-level game, cf. Chapter 1.6, transnational industrial alliances can also be used to make it more difficult “domestically” for the EU (and especially in the biggest country Germany) to implement unfavorable market regulations and interventions for natural gas producers. As a consequence, such alliances can be used to influence the Norwegian government’s negotiation position and in diplomatic processes with the EU. Transnational alliances are however, not concerned with the maximum benefit for their own country or the EU, but with the maximum benefit for themselves across borders, and can in this way also attempt to capture Norwegian policy making for their own purposes.

In line with a neo-Schumpeterian understanding of the role of the political entrepreneur, cf. Chapter 1.1 and 1.7, it is important for the Norwegian natural gas entrepreneurship to maintain commercial and political competence, in order to defend national interests in an imperfect and changing international environment. It appears to be a need for more competence of the political economy of European natural gas on the political level, not less. As in the theory for comparative advantage explaining the importance of relative prices and costs for competitiveness, national policy making relative to other countries is significant in the exploitation of opportunities.

It is for the continuation of the Norwegian state’s natural gas enterprise important to understand EU motives and policies, and to always be ahead to exert an influence, as well as take precautions and adopt strategies to avoid problems and exploit opportunities. This is a preferred strategy rather than just copying laws and regulations passively and continuing to produce and sell gas as before. It has been the combined dynamism of technological, commercial *and political* ability to innovate that was and will be decisive for the NGF’s position in an ongoing process of economic and political integration and market

liberalization. This means that the political entrepreneurship has become more regulative than before, but the need in segments for rather interventionist actions, domestically, as well as towards downstream companies, nation states and the EU itself may recur.



## 6 Conclusions

As political entrepreneur the Norwegian state combined several instruments when creating her petroleum industry and a national natural gas strategy, cf. Chapter 2. Measures were regulative as well as interventionist and Norwegian companies received preferential treatment in the infant stage. From the very start, the state also engaged itself directly in the industry through its own company. Important goals were to defend national control of the petroleum sector, optimal resource management and to capture as much rent as possible. With substantial political and financial risk the state managed not only to establish the industry, but to also be the driving force in taking care of and contribute to change and evolution. Without these efforts Norway, as many other resource rich countries, could have been another victim of elements of the resource curse paradox.<sup>85</sup>

*“Being blessed with large petroleum resources is not enough to assure that their management will lead to social well-being” (Estrada 2006).*

Through several discrete and incremental innovative changes the state managed to create a competitive Norwegian petroleum industry from nothing in only a couple of decades, and to take most of the profits from the activities itself. *Ex post*, policies turned out to be largely successful;

*“The Norwegian model is now frequently looked to from other international oil and gas producers around the world” (Olsen 2002);*

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<sup>85</sup> The resource curse paradox refers to the empirical fact that countries with an abundance of natural resources tend to have less economic growth than countries without natural resources. The reasons could be a decline in the competitiveness of other economic sectors, caused by appreciation of the real exchange rate and / or high inflation, substantial price volatility on the resource, government mismanagement, or corruption (Auty 1990, Djankov, Montalvo and Reynal-Querol 2005, Gylfason 2000, Mauro 1995, Sachs and Warner 1995 and 2001). The term resource curse thesis was first used by Auty (1993). See also Footnote 31 about the “Dutch disease”.

*“Many factors have contributed to this success, but it is the mixture of strategies that seems to have worked” (Gordon and Stenvoll 2007).*

When entering the 1990s and integration processes with the EU, Norwegian petroleum policy and natural gas policy was under strong political control. The integration with the EU changed and influenced Norwegian natural gas industry and policy through legal, economic and political factors and mechanisms. This last chapter draws together some conclusions from the analysis. Firstly, main empirical findings from the study are outlined. Secondly, an assessment is made of the multidisciplinary approach that has drawn upon endogenous growth theory to understand the role of the Norwegian state as political entrepreneur, and the disciplines of economics and political science within an IPE framework to understand EU integration processes and their impact on national policy making. Thirdly, contributions to an understanding of Norwegian petroleum policy are discussed. Fourthly, contributions to understanding the Norwegian – EU relationship are outlined. Fifthly and finally, remarks on possible theoretical implications from the study are proposed.

## 6.1 Empirical findings

The study has demonstrated that Norwegian economic integration with the EU has had an impact on many of the factors and mechanisms important to the national natural gas entrepreneurship, and also partly on goals. Most importantly, the EEA agreement has had a legal impact on maneuvering room and the options for *domestic* policy formulation, cf. Chapter 3. The *legal bindings* accompanying the agreement made Norway import general EU competition law and specific regulations (directives). The strength of nationally defined regulations and protection of the functioning of and framework for the domestic markets to support the Norwegian supply industry and oil companies was changed, and in some cases weakened. Preferential treatment as well as the governmental control of the state oil company Statoil/StatoilHydro was weakened. Strong pressure was put on the Norwegian gas model through a twin pressure from the EU (adhering to EU competition law and to her first gas directive), and significant changes resulted in 2001/2002. And together with Statoil’s privatization this led to a dissolving of the GFU and FU arrangements.

Norway had to eventually follow EU rules, but in spite of her legal “defeat” she maintained much of the entrepreneurial initiative on her gas model through regulative innovation; increased direct state participation; the way she reorganized natural gas activities; ownership dominance; and, a state controlled infrastructure. The attitude to defend national interests was largely maintained, but policy was now exercised within a legal and political new framework. A lesson learned was that although the EEA agreement leads to more decisions made by independent market actors, it can also lead to more state involvement when national interests are to be defended. Norway adapted formally to EU rules and regulations, while at the same time gave their contents and interpretations a Norwegian flavor.

Another lesson learned was that the individual (or national) adaptation to an agreement may be of greatest importance when its effects are assessed: *de jure* rules and regulations must be followed, but the *de facto* maneuvering room for interpretations and adaptation can make results vary a lot. Norway has nevertheless through the EEA agreement become more limited in her freedom to choose natural gas policy than other exporters of natural gas. Nonetheless, the change was less dramatic than if she had merely adhered to EU demands passively. Some changes would have been necessary in the model, also without the twin EU pressure, because of industrial and market maturation and Statoil privatization.

Impacts from EU gas market liberalization were discussed in Chapter 4. One conclusion was that a more liberal market leads to more price volatility. Producers will in the short and medium term benefit from market liberalization when markets are tight and lose when they are weak. A more liberal market also leads gas contracts to become more pluralistic and short-term. The faster and stronger the market responds to a change in supply and demand, the faster the portfolio of long-term, short-term and spot contracts changes. The liberalization of the EU gas market may on the one hand contribute to improving security-of-supply of gas for consumer countries, by creating an open market with lower prices. On the other hand, more volatile, uncertain and periodically lower producer prices may lead to a drop in large investment projects, and a deterioration of security-of-supply in the long run, especially when the relevant

segment of the market must be considered immature. In weak market situations the TOP problems experienced in the U.K. and the U.S. could be repeated in Europe. However, as long as we face generally tight energy markets in Europe and elsewhere, TOP problems should not become significant in the EU gas market.

For the Norwegian gas model, one conclusion was that market maturity and effects from market liberalization made it necessary for Norway to have a more flexible way of selling gas than under the rather rigid GFU system. A second conclusion was that market liberalization also leads to a need for Norwegian gas sellers who integrate downstream; firstly, to be able to reap the full benefit from market openings and the sale to new and old, smaller and more diversified customers; secondly, to open for the opportunity to take profits from larger parts of the gas chain than just on the NCS, and balance revenues when market conditions and rent distribution change; and; thirdly, to control a market outlet for her gas, especially to prepare for when markets eventually again become weak.

A third conclusion was that the entrepreneurial economic and political risk the Norwegian state took to build an *ex ante* non-existing Norwegian petroleum industry and create a national natural gas policy as part of this, has shifted to an *ex post* political risk linked to; a) EU demands for reorganization of the Norwegian industry and its impacts on control and profitability of sunk and future investments; b) market developments and EU reorganization and other political actions that negatively influence market terms and prices; and c) taxation of natural gas usage that could work for the EU as an optimal tariff and transfer rent from the treasuries of producing countries to EU countries' treasuries. These political risks may threaten security-of-demand for Norway (and other natural gas exporting countries) in the future. The combined effects from market liberalization and increase in natural gas taxes on producers, contribute consequently also to influence long-term security-of-supply for EU consumers.

Market liberalization and maturation make it necessary for the Norwegian political natural gas entrepreneurship to become more regulative than interventionist (as under the GFU/FU system) in most commercial deals. The market situation will however for a long time be a mixture where segments of the

market can still be in their first or second stages (cf. Chapter 4.1), and at the same time, the merging of large downstream actors will impede competition also where the market has reached its third stage. The increased interest in overall market developments lead to a clearer interest sharing with other exporters (such as Russia), and the competitive elements between producers becomes less predominant. To avoid oversupply and maintain a tight balance between total supply and demand in the market it will be important how the combined supply from all exporters to the market add up.

Chapter 5 discussed constraints to full liberalization of the EU gas market, and their modifying effects on the political entrepreneurship. Firstly, there is an uncertainty about to which extent the EU will succeed in making comprehensive or common policy in the field of natural gas, or whether essential parts of it will remain at national levels. Secondly, the politicization of trans- and intercontinental European energy trade raises the questions of security-of-supply and security-of-demand. The EU has no jurisdiction over major parts of the supply and transit sides of the market. Nor do producers have control over the EU. There is an uncertainty about how the external political dimensions will be handled and influence the development of a Single Market for natural gas.

Thirdly the non-renewable nature of natural gas makes it a scarce commodity compared to renewable sources of energy. More natural gas will not necessarily be provided when prices go up, independent of external political relations. Downstream market efficiency measures must eventually be complemented by the EU by energy efficiency improvements and the phasing in of renewable energy sources to avoid shortages becoming a substantial economic and political problem. Fourthly, regulatory challenges in by-nature imperfect markets make only second or third best solutions attainable. It can be argued both in favor of and against most practical arrangements by parties involved. This may lead to gaming between the regulator(s) and those affected, and outcomes can be heavily colored by the economic and political strength of the parties. Taken together, the study considers the EU gas market is not to become “perfectly and fully” liberalized, but that it will remain largely imperfect and politicized in the foreseeable future, albeit in most cases more open and flexible than before.

The need for entrepreneurial actions, on both Norwegian and EU political levels, has been evident, and are expected to persist within this imperfect commercial and political framework. The NGF needs not only proper domestic organization, but also proper downstream market organization and an updated and active policy in both Norway and the EU. It will be important for Norway to emphasize the long-term character of the industry, as well as the exhaustible character of the resource, towards EU policy makers, while at the same time positioning her in relations to national governments in purchasing countries and through intra-industrial alliances both up and downstream. In line with the two-level game, cf. Chapter 1.6, transnational industrial alliances can also be used to make it more difficult “domestically” for the EU to implement unfavorable market regulations and interventions for natural gas producers. Such alliances can consequently be used as a source of influence in the Norwegian government’s negotiating position and as an additional factor in diplomatic relations with the EU and EU member countries. In line with a neo-Schumpeterian understanding of the role of the political entrepreneur, it will be important for Norwegian natural gas entrepreneurship to maintain high *relative* competence to interplay with other countries, the EU and the intra-industrial alliances in order to maintain national interests.

Not only political factors however influence the situation. Neither EU gas markets nor the Norwegian petroleum industry were in their infant stages in the 1990s and beyond. A different policy was needed for both as compared to the 1970s and 1980s. Another aspect was changes in the profitability of the petroleum industry, which besides costs depends heavily on the price of oil. Relatively low oil prices in the period 1986-2001 led to low attention on security-of-supply and scarcity issues among consuming nations. Higher energy prices after 2001 have brought this issue high up onto the political agenda once again, as they were during the oil shocks in the 1970s/1980s. Political and non-political factors together dynamically contribute to challenge the maneuvering room and policy options, and partly also the goals, for both EU policy and for the Norwegian state’s natural gas entrepreneurship. When for example, energy markets once again becomes weak and oil prices drop, the maneuvering room for EU policy making becomes greater and her possibilities for implementing unfavorable

arrangements for producers increases. TOP problems may also arise in old contracts when markets become weak. Hence, the strength of producers in the present tight market situation should be used also to prepare for best possible positions assuming that markets in the future once again becomes weak.

### **6.1.1 Main implications for the Norwegian state's natural gas entrepreneurship**

*Firstly*, the EEA agreement has legally bound the formulation of Norwegian petroleum policy through "domestication" of EU competition law and the importation of EU directives, cf. Chapter 3. The impacts of these changes were however modified by an active reorganization of the petroleum industry and natural gas strategy through the entrepreneurial efforts of the Norwegian state. Many of the purposes of the NGF when adjusting to EU demands in 2001/2002 were retained. The direction of changes was clear, but their impact on the ability to reach relevant goals was not too significant. The impression in sum is that it was more important for Norway to adhere to EU principles than EU interests. The NGF was not closed down; it took down some buildings and raised new ones, with updated and modernized equipment.

However, the EEA agreement made the domestic maneuvering room for Norwegian natural gas policy smaller, and changed and reduced the number of policy options. The strength of nationally defined regulations and protection of the functioning of and the framework for the domestic markets to support the Norwegian supply industry and oil companies was weakened. The strong state as a controlling industrial and resource management system became more regulative than direct and of an interventionist character. Together with Statoil's privatization, it weakened the possibility of preferential treatment as well as governmental control of the state oil company Statoil/StatoilHydro. International oil companies have become more important on the NCS in terms of licenses and exploration and production activity, although many of them are engaged (only) in tale production and the development of smaller fields.

Moreover, many of these changes would mostly likely have taken place without the EEA agreement. Industrial and market maturity contributed strongly

to the changes making the introduction of more liberal principles for natural gas production, transportation and trade less dramatic. Under a similar liberal industrial and market paradigm it would however, have been much more difficult to build a Norwegian petroleum industry from nothing as in the 1970s, if the petroleum resources were discovered today and not in the 1970s/1980s. Indeed, this also accounts for the development of the EU transportation infrastructure and demand. The three stages discussed in Chapter 4.1 for the evolution of a natural gas market can explain this. In its infant first stage, characterized by a need for large investments both up- and downstream and reciprocal dependence on a stable demand and supply to defend investments, a managed market design is needed. It is in its third stage when transmission companies can take on more the transporter role and the industry and market has matured, market transactions can become more flexible. The third stage can eventually be reached after having passed through the second stage characterized by increasingly more monopolistic purchasing power obtained when the transmission companies more or less are the only that act as merchants.

*Secondly*, Norway has become more limited in her freedom to choose domestic industrial design compared to other exporters of natural gas to EU markets, such as Russia, cf. Chapter 3.6 and 5.3. The EEA agreement pressured the formulation of Norwegian foreign energy policy to be made less independently. EU market liberalization processes have at the same time led to a convergence of Norwegian and Russian interests in some areas. Any similar interplay with the Russians in regulating volumes in a future weak EU natural gas market, as with OPEC in the oil market, will presumably be met with harsh reactions. Foreign bindings and influence are consequently more clearly emphasized in Norwegian foreign energy policy formulation now than before.

*Thirdly*, the maturing and privatization of Statoil together with the reorganization of the petroleum sector caused by EU pressure made the company more independent from the state, cf. Chapter 2.6 and 3.5-6. The merger to become StatoilHydro reinforced this independency. Some influence over oil and gas policy has moved from the political administrative system (MPE, political parties and the Storting) towards commercial actors and companies. Within the governmental bureaucracy the MFA has gained a marginally stronger influence

on (general) petroleum policy because the MFA is the main ministry dealing with the EU and EU matters. Still, however, the changes reinforce the impression of a strong MPE with determination and competence to update natural gas entrepreneurship in line with industrial, market and political developments to defend nationally defined interests. The establishment of new fully state owned companies Petoro, and Gassco, strengthened the formal role of the state (MPE) at expense of Statoil.

*Fourthly*, the opportunities to politically support downstream industrial engagements have become fewer, cf. Chapter 3.6. Increased competition and the opening of investments in up (on the NCS) and downstream (EU) markets have opened for increased vertical integration for and between natural gas companies throughout the gas chain, cf. Chapter 4.8. The situation opens for greater industrial engagements, on a smaller scale on the NCS (unless huge new fields are found) and downstream in EU markets for Norwegian companies. The direct downstream state engagements in the sales of natural gas, as exercised before through Statoil and the GFU and in relations with purchasing countries and companies, have become less direct and more regulative, more organized through general diplomatic channels and within general political frameworks (as through the MFA). The same accounts for support to Norwegian companies wanting to invest downstream.

*Fifthly*, the interdependence between Norway and the EU gives Norway greater maneuvering room in tight market situations and the EU more political influence when markets are weak, cf. Chapter 4. The entrepreneurial economic and political *ex post* risk that the Norwegian state faces linked to EU demands for reorganization of the Norwegian industry and impacts on control and profitability of long term investments, market developments and reorganization and other political actions, such as taxation, has contributed to an increase in the asymmetry in the interdependent relationship between the two. As the asymmetry also depends on the tightness of energy markets in general and natural gas markets in particular, the high energy prices over the past years have not yet made it possible for the EU to exercise these options in the disfavor of Norway (or other exporters). The processes continue however to challenge the formulation of, and partly also the goals for both EU and Norwegian natural gas

policy. With an increasingly more integrated and politicized natural gas market, the NGF needs proper policy making at both the Norwegian and the EU side to deal with long-term common and conflicting concerns, cf. Chapter 5.

*Sixthly*, the nationally defined ideological platform for industrial and social goals of petroleum activities has been modified towards more liberal ideas as compared to how it was defined in the 10 Oil Commandments and practiced in the 1970s and 1980s, cf. Chapter 3.5-6. The objectives for the petroleum activities and the definition of what are national interests, have been modified in a direction that treats the petroleum sector as more – but by no means entirely – similar to other sectors. The political fragmentation in Norway contributes to a further weakening of the strength of the elements of a realist/economic nationalist view of how Norwegian petroleum interests ought to be defined and best served compared with the start-up phase of the industry.

*Seventhly*, because this study expects EU and European gas markets to remain imperfect and politicized in the foreseeable future, the potential for entrepreneurial actions on both Norwegian and EU levels are expected to persist, although the scope and strength of measures have strongly changed since the infant build-up period of the market and the industry, cf. Chapter 5. Imperfect markets open for opportunities to exploit advantages, avoid difficulties and to influence the development, but also to be negatively affected by the actions of others. Riker (1986) argues that a political entrepreneur can break up institutionally induced and maintained equilibria to create new and more profitable political outcomes by agenda control, strategic behavior and the introduction of new policy dimensions to political debate. In this perspective also the EU can be considered entrepreneurial through hitherto and coming changes, along with political regulations and interventions.

For the NGF, possibilities and needs for exercising entrepreneurship are often greater when markets are imperfect, usually yielding greater profit opportunities than in contestable markets. Losses can however also be greater if the NGF passively adapts to other actors actions, affecting her political and commercial maneuvering room. Commercial and political opportunities open for exploiting advantages, avoid difficulties and influence the development on both sides, but

also to experience negative effects of each other and third-parties actions (for example from the Russian side). The EU gas market will continue to become more open and flexible, but the scope and shape of changes depends on intra and external EU processes on both political and commercial levels (including Norway), and their interactions.

## 6.2 Evaluation of the theoretical approach

The analysis has drawn upon endogenous growth theory to understand the role of the Norwegian state as a political entrepreneur in creating and developing her petroleum industry and natural gas strategy. To understand Norwegian – EU and EU integration processes and their impacts on national policy making, the disciplines of economics and political science were used within an IPE framework. Three main arguments for using more disciplines in interaction rather than one single discipline in the analyses were presented; firstly, to grasp a comprehensive understanding of the role of a political entrepreneur in industrial development processes; secondly, the role of the political economy of the energy industry and markets; and thirdly, the pressure that economic integration put for both legal, political, institutional and ideological change.

The impacts on the entrepreneurship from the integration processes were measured by changes in ability to reach goals, through changes in maneuvering room and policy options, and by changes in the goals themselves. The aim was to identify changes in economic and political factors, actors and mechanisms that determine entrepreneurial maneuvering room and policy options and actual policy made, and the degree of policy convergence between Norway and the EU. As more factors influence these variables it was attempted to hold other sources for change constant in the discussions and, in a *ceteris paribus* approach, to identify the directions of influence from the integration processes and argue about their strength and scope.

The study has furthered political economy approaches by using economics and political science as unidisciplinary analytical tools and then combining them in a multidisciplinary design. In this way the two disciplines have studied various aspects of issues. The integration between them was made through

combining partial studies or by taking conclusions from one unidisciplinary analysis to serve as input into research within the other. The cooperation between the disciplines has been mutual and cumulative, but not interactive.

One difference between private and political entrepreneurship is that while a private entrepreneur mostly has profit as goal for economic activities, a political entrepreneur has social goals for his actions. Social goals can be the source of more long-term concerns for society, and a more comprehensive view on economic activity than the one possessed by private entrepreneurs. Moreover, the private entrepreneurs are in most cases too small to internalize externalities into their decisions. Another difference is that a political entrepreneur has instruments to use that the private entrepreneur does not have at their disposal. The political entrepreneur can be engaged in a business similar to the private entrepreneur, but he can also use political interventions and regulative measures to influence economic activities.

The point of departure for the IPE framework is that states have become economically interdependent, and studies how transnational relations, institutional and interactional aspects between countries are governed. Domestic politics were included in the analysis, making economic and political outcomes dependent on both state and non-state actors and factors, domestically as well as internationally. It contributed to understanding economic integration processes and their effects. The combination with endogenous growth theory made it possible to analyze effects of changes through the EEA agreement and market liberalization, on the political entrepreneurship.

Although entrepreneurship and innovation is seen as primary to EU economic developments, as in the Lisbon Strategy (EU 2005c), the various European integration studies is not found to focus on how national political entrepreneurship interacts with EU policy and development. The Lisbon strategy aims to make the EU a more competitive and knowledge-based dynamic economy. The strategy is largely based on the literature on private entrepreneurship, as reviewed in Chapter 1.1, starting with the work of Joseph Schumpeter. The types of public support to be given for these developments are however exclusively of a "Porterian" type (Porter 1990:680-682) either they are

given on an EU or on a national level. The aim is to optimize the interests of the Community at large in an increasingly more integrated, global world. This implies that regions (and not necessarily countries) and sectors that are most able to innovate should be supported to experience the greatest economic growth. The attempted political enterprise by the EU has motives comparable to those of Norway when it was deciding to embark on creating a competitive national petroleum industry; although, much more limited in scope compared to the 10 Oil Commandments. The political enterprise attempted was also limited compared to the wide array of political instruments made available to the Norwegian petroleum enterprise. And finally, it does not attempt to optimize interests for individual countries, but instead the interests of the entire European Union.

The dynamic understanding of competitiveness can in both cases however principally be considered to extend the understanding of private entrepreneurship to political entrepreneurship, where the state (or the EU) is seen as collaborator and even leader in economic developments. In line with Neo-Schumpeterian approaches (such as in Hanusch and Pyka 2007), it is for a political entrepreneur important to continually lead the political understanding, adjustment and influence of integrating countries' policies in order to maintain advantages and freedom of action compared to a possibly more passive (imitating) political attitude. The dynamism of technological, commercial and *political* ability to innovate is decisive for continued competitiveness. As in the theory for comparative advantage explaining the importance of relative prices and costs, it is policy actions relative to the surroundings that are important for success. However, a major difference between Norwegian and EU (potential) enterprises is the ideological framework making Norwegian petroleum policy at the time much more interventionist/realist than EU innovation policy is at present. The exogenous change that the discoveries of the petroleum resources on the NCS represented were also much more dramatic (or discrete) for the Norwegian state than the more incrementally increased competitive pressure that the EU experience from an integrating global economy and the expansion of Asian economies.

In the need for understanding the impacts from the multifaceted and dynamic integration effects on the magnitude of factors and mechanisms important to the political entrepreneur it would have been difficult to limit the study to using an unidisciplinary approach. Any theoretical models used to analyze an issue will always yield degrees of understanding, and the optimal choice of approach depends on the objects to be analyzed. Economic approaches in this study may for example provide significant contributions to the understanding of a particular issue under the assumptions made. On the one hand, this means that other economic approaches will be disregarded as well as approaches from other disciplines and their combination. On the other hand, they are often the source of strong advice for policy choice.

*“Economic term calculations constitute often the prime criterion for good policy for economists” (Strange 1995).*

States however are more heterogeneous and have a more complex set of interests to be optimized, as analyzed within political science.

Underdal (1984:73) characterizes the generating power of a model in terms of

*“its capacity for generating propositions with certain desired qualities, such as being precise, tenable, and non-trivial as well as numerous and varied”.*

A model may give good scores according to some criteria and less good scores according to others. Underdal (ibid.) sees the generating power of a model,

*“defined as a simplified representation of some category of real-world phenomenon”,*

as a function of its score according to it's:

- *Generality* or intended scope of validity. The more general, the better it relates to the real-world situation;
- *Conclusiveness* or the ability to produce precise, specific and non-trivial propositions. It must be possible to translate the core concepts of the model into operational terms;
- *Validity* or ability to capture the essence of a real-world phenomenon;

- *Parsimony* represented by the increasing costs of using a model which is growing more complex. A partial model is less costly to operate and provides a clearer view of relations between and answers to the phenomenon studied. Consequently some trade-offs

*“most often has to be made between validity and parsimony” (ibid.).*

The advantages and disadvantages in the multidisciplinary approaches used in this study were justified with the argument that it would provide a better understanding of relationships at an aggregated level, although the more or less exact outcomes as produced from single economic or political theories and methods might be lost. The study used partial (economic and political) approaches as important elements in the analysis, serving as input for the entrepreneur in defining his multidisciplinary maneuvering room, as well as providing advice for policy choice.

The analyses have attempted to balance the need for validity and conclusiveness against the need for getting more precise results through parsimonious (or partial) models. Unidisciplinary analyses have been used in many parts of this study as components to be understood and interpreted from within the framework of the multidisciplinary approach. The analyses of price and contractual effects of liberalization and gas usage taxes in Chapter 4.4-5 and 4.7, implication of the non-renewable nature of natural gas on market outcome and regulatory issues for transmission and distribution in Chapter 5.4-5, were undertaken within the discipline of economics. This also accounts for the use of endogenous growth theory as outlined in Chapter 1.1. In analyzing effects of negotiation processes, game theory was applied in Chapter 1.4 and 3.3. Institutional and ideological effects of economic integration and the interaction between domestic and external agents through Chapter 1, and the discussions of the EEA agreement, role of intra-EU politics, international affairs and security-of-supply and -demand in Chapter 3.1 and 5.2-3, were studied with perspectives from political science.

While being highly relevant for partial analyses, an unidisciplinary approach may however become trivial when the aim is to provide a comprehensive understanding of the systemic and structural uncertainty EU integration

processes and the challenges to Norwegian political entrepreneurship, cf. the Introductory Chapter. At the aggregated level conclusiveness and validity must often be given priority at the expense of parsimony, while generality

*“is important only as long as it does not disrupt the score at the other criteria”*  
(Claes 2001:370).

Models have consequently different scores on the criteria Underdal sets up for the generating power of a model, such that the choice of approach depends on the purpose of the analysis. While unidisciplinary models are considered to provide better answers in some situations, in other situations more types of explanatory variables have to be pulled together to gain an understanding of both the economic and political relationships evident in a strongly politicized European gas market, and the complex challenges Norway has been facing as a natural gas entrepreneur.

The overall challenge for the petroleum entrepreneur is in the end linked to the understanding of the interplay between the qualitatively different forces, and to identify where and when it matters that entrepreneurial actions are undertaken. The balance between the need for parsimony versus conclusiveness and validity was made in order to understand the political entrepreneur as an economic and political risk-taker. Trivial uncertainty was analyzed by unidisciplinary approaches. To understand systemic uncertainty the interplay between qualitatively different forces was enhanced by extending disciplinary boundaries in a multidisciplinary manner. And when the models involved substantial degrees of freedom the importance of choices and strategies were underlined to deal with structural uncertainty; as when an outcome is genuinely uncertain it creates an opportunity to be exploited.

In his political economy approach to analyze oil-producing countries' cooperation Claes (2001:9) similarly combines disciplines to gain a better and more comprehensive understanding of a cross-disciplinary issue;

*“As will become evident from the empirical analysis in this study, the aspects discussed complement each other and are interrelated”.*

He refers to Elster (1989:13-14) who proposes a comprehensive model for actor's behavior;

*"We begin with a large set of all abstractly possible actions that an individual might undertake. The first filter is made up of all the physical, economic, legal and psychological constraints that the individual face. The actions consistent with these constraints form his opportunity set. The second filter is a mechanism that determines which action within the opportunity set will actually be carried out..."*

In this study the first filter and opportunity is a parallel to the maneuvering room for the entrepreneur, which is identified by the multidisciplinary analysis and characterized by the trivial, systemic and structural uncertainty he is facing, as outlined in the Introduction Chapter. The second filter and actual strategy chosen is determined by the possible policy choices, as defined within the maneuvering room and the choice actually made among these according to the preferences of the political entrepreneur.

### **6.3 Contributions to understanding Norwegian petroleum policy**

The study has demonstrated that there will be losers and winners from market liberalization, depending on how liberalization takes place, and how commercial and political players throughout the gas chain behave, individually and together, cf. Chapter 1.2, 1.5, 3.3, 5.2-5. As gas is a non-renewable and strategic resource in the European market, a liberalization of the market may have a somewhat different effect than in most other liberalized markets. The continued existence of an economic rent contributes to make it more politicized than most other markets. Even if Norway economically, politically and in security terms is allied with the consumer countries and has many interests in common with these, Norway must also be aware of the fact that she is quite alone in safeguarding her combined interests as a large petroleum exporter within this context.

Thus, a strategy for Norwegian gas production and sale must include holistic evaluations and juxtapositions of a range of different circumstances of a technical, social, political and economic character. In order to become consistent, a Norwegian gas strategy must be developed based on an understanding both of

economic and political circumstance in themselves, and the relation between them. Market developments and political decisions together force new commercial strategies, increase the need for new forms of cooperation between the industry and Norwegian authorities, and put pressure on authorities to influence and cooperate with international agencies and purchasing countries', as well as other exporting countries. The NGF has inhibited many of these qualities.

The study has concluded that Norway would have had great difficulties building a national petroleum industry from nothing if the resources were found now and not in the 1970s. It would under the EEA agreement be difficult to give Statoil the best licenses and not to at the outset more efficient foreign competitors. Especially it would be difficult to discriminate to the advantage of the Norwegian supply industry. Within a liberal international trade framework (as at present compared to the 1970s/1980s) it is however possible, in a "Porterian" way, for the state to contribute to growth in industries and companies selling their products and services in fast growing international markets with large profits. Rather than giving direct support to single companies, which clearly would conflict with increasingly more comprehensive WTO and EU rules, support can be given through various forms of infrastructural support, such as roads, rail, air, telecommunication, education and research important to specific sectors. In a strategic trade theoretical approach a government actively makes arrangements for both import and export competing industries within the framework of an international (liberal) economic regime, cf. Chapter 1.2 and Chapter 1.4.

A government can however, not address support towards specific companies, a situation different to the 1970s. Political measures must in terms of single companies be neutral. This neutrality does however not mean that policy must be neutral to economic growth, employment or regional development. Infrastructural support will help long term value creation nationally in relevant sectors and regions. Even if the integration processes with the EU leads to a greater number of decisions made by independent market actors, the EEA agreement itself allows for more state involvement when national interests have to be defended. State and state influenced organizations and companies can make investment decisions and actions that have positive social effects and which may be different compared with a private company making decisions.

In Norway it is especially difficult to avoid the state becoming an important participant in one way or another in the entrepreneurial development of large industries. Firstly, as in any other country, the state must be an important actor as a “Porterian” infrastructural provider. Secondly, the Norwegian state owns the now enormous Petroleum Fund and possesses the largest bulk of financial resources in the country. Thirdly, the state owns about 40 per cent of combined Norwegian industries. When the government has expressed desires for a larger and more efficient private ownership to act as entrepreneur in Norwegian industry (as in the government report *Stortingsmelding 2002: 22*) the state must remain an important partner different from the state in many other market economies. Former Statoil director Norvik (2006) argued that the ownership of large companies such as Statoil should continue to be dominated by the state (although not as the only owner) and offer a national main base to maintain control of NCS activities, further develop supply industries, secure energy supply to the country, undertake research and development and act as an industrial locomotive.

It is in this context important to note that the industrial “tool box” is not empty in a liberal economic regime. More comprehensive international rules for trade and economic activity have changed the maneuvering room, reducing it, but not removed it. Vårheim (2005) has in this perspective compared the Norwegian and Irish innovation policy in the period 1987-2000. He divides the liberal economic system into two main categories; liberal and coordinated market economies (LMEs and CMEs). In the terminology of political economy these should approximate orthodox and interventionist liberal economic systems, cf. Chapter 1.1. Vårheim argues that impulses from the globalized economy can lead to both more and less domestic liberalization in LMEs and CMEs. In industrial policy, Ireland has moved from a liberal to a coordinated market economy, while Norway has moved in the reverse direction in the same period. Ireland has become an innovative high tech country while Norwegian industrial policy has been more passive and largely conserved the industrial structure, other than in

oil and fisheries, Vårheim argues.<sup>86</sup> An important difference between the two countries is that visions and institutions have been drawn better together in Ireland, while in Norway they have become more fragmented. He finds that the maneuvering room in an integrated European and global economy has been reduced, but that it also depends on national choices, institutions and visions.

The political fragmentation that Norway according to Vårheim has experienced after the drop in oil prices in 1986, and which is also argued for in this study and reinforced by the integration with the EU, is in stark contrast to the period when the petroleum activities were built. During this period coordination and common visions were strong. The discussions were not whether or not the state should be involved in petroleum activities, but rather how. In Ireland such coordination was strengthened in spite of the development of an increasingly more liberal international economy. Finland had similar experiences after the break-up of the Soviet Union (Moen 2002). Japan and other growth economies in Asia are additional examples. The state can within a liberal international framework limit itself to NPM type of measures focusing on costs saving and economic efficiency, but it can also focus on relatively interventionist measures in support and regulation of specific economic activities.

Today the possibility of the state following an active industrial and innovation policy applies to the case of “normal” industries and does not equally well appears to fit a situation when the economy experiences an exogenous shock, as through the discovery of the huge petroleum reserves, and subsequent desire of the state to build national industry to deal with such an event. Many of the state entrepreneurial efforts from the 1970s and 1980s would today be in conflict with present international trade regulations. In spite of the modifying comments above, it would be far more difficult to build a nationally controlled Norwegian petroleum industry if oil and gas was found today.

There can however be a need for new entrepreneurship by the state following the success of the petroleum sector. The tremendous growth of the Petroleum

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<sup>86</sup> The success of Ireland also involved a number of other factors such as cheap labor in the beginning of her boom, English language, financial transfers from the EU and beneficial economic cycles in general.

Fund, when oil prices reached high levels once again after 2001 can today be considered a new exogenous change or shock to the Norwegian economy and society. The role played between the Labor party acting cooperatively with industry and bureaucracy in defining national interests in the 1970s has however not been replaced by some other nationally unifying leadership. Slagstad (2001) discusses how first the bureaucracy, and then the liberal state (based on the party "Venstre") before social democracy with the Labor party at the wheel after WWII, shaped a Norwegian system that through social education, institution building and mental creation provided a space for national strategies and strategists throughout the 19<sup>th</sup> and 20<sup>th</sup> century. Today, Norwegian policy seems more to be the result of the dynamisms of actors and factors themselves, than about a comprehensive set of goals and debate about the means to bring about their realization.

In conceptions of orthodox liberalism, governments should not have a role, neither in the form of direct involvement in business activities, nor in terms of policies that favor certain business or branches. Entrepreneurship is about individuals taking actions on their own. This study argues however, that such an approach to the role of a government is unrealistic in a complex economic system, where a myriad of regulations and programs are in place, particularly in the petroleum sector, and more in the field of energy than in most other sectors. There are more arguments for this:

Firstly, there is considerable room for governments to facilitate entrepreneurship in a non-interventionist way, in a way similar to the role of governments proposed by Porter (1990). A smooth-running market economy is the best way of encouraging entrepreneurship. Moreover, rather than direct support the political entrepreneur seeks to help the economy function in a competitive manner. Teigen (2007:37-38) discusses these differences with concepts of normative and positive theories that define a state's maneuvering room within regulative approaches for state behavior towards private economic activities.

Secondly, beyond its regulative role, a state can be an industrial actor itself through fully owned state companies, as well as a regulator in a liberal economic

regime. The rise of alternative organizational models of economic activity and public service such as privatization, partnerships and special operating agencies require a more extensive and sophisticated use of regulation than under the model of the Keynesian welfare state. At the same time, the NPM liberalization discourse, the pressures of globalization and new information and communication technologies have contributed to an ambivalence regarding regulation. If the emerging regulatory needs of the state are not to meet pervasive opposition and hostility, they may require innovative approaches that avoid the rigidity and insensitivity of an orthodox approach to liberalization and the regulation of markets. Also public regulations must be innovative. Regulatory innovation approaches recognize the growing importance of regulation as an important tool used by the increasingly networked state (Black, Lodge and Thatcher 2006).

Thirdly, EU (or in general: international) regulations in many cases end up being more about form than substance, or “fuzzy liberalization” (Andersen and Sitter 2009, cf. Chapter 3.6). When Norwegian and EU Win-Sets are considered not to overlap, cf. Figure 1.5, the solution can be that Norway formally adapts to EU rules and regulations, and at the same time, gives their contents a Norwegian flavor, cf. Chapter 3.4. The formal Win-Sets are enlarged for both, while their *de facto* contents are not changed a great deal.

Hence, a main challenge for Norwegian policy making today appears to be not only that the country is restrained by international rules and under pressure from companies and other countries, but that it also lacks a strong and unifying vision combining freedom of action with vigor:

*“Governance at any level, whether national or international, must rest on shared beliefs, cultural values, and, most of all, a common identity” ... “Identities and loyalties are still national or even local, ethnic, and racial”.. “Under such circumstances, talk of substituting global governance for the primacy of the national state is in vain” (Gilpin 2001:402).*

The government responded to the domestic and international pressure on her petroleum enterprise around the turn of the century, but had lost some of the initiative. Slagstad (2001:436-437) claims that politicians had no vision of how to

exploit their maneuvering room in the context of a new international economy. At the same time, it was necessary to adjust political instruments to international rules and practices (Grønlie 2000). The changes were only made when Norway had to change policy, and new models were developed to maintain industrial control and market positions. For the Norwegian gas model, it was however *de facto* not totally liberalized; it followed more the kinked than oscillating curve in Figure 1.3, and did not reach up to the AB line. This parallels the imperfections in the liberalization of downstream EU gas markets in general, cf. Chapter 5. The Norwegian solution maintained significant, if modified political control of the sector. The bureaucracy (MPE), more than the politicians, made innovative regulatory changes to the situation encountered.

The discovery of petroleum resources and the state's success in building a national petroleum industry and capturing most of the rent have made Norway a "petroleum nation", with a clear focus on the money and power accrued by the Norwegian state. Non-oil social considerations have gradually been stepped down in the design of petroleum policy, as opposed to the Storting report of 1974 when the intention was to use petro-money to build a "qualitatively better society", cf. Chapter 2.1. Even though efforts in the 1970s resulted in too great a conservation of industrial structures in an increasingly more economically integrated world, there is today very little discussion about the possibility of Norway increasing welfare and competence in the population, creating new economic activities and preserving cultural and social identity; especially against the backdrop of a sizeable Petroleum Fund accumulated in recent years, cf. Chapter 2.4. Reinert (2006) cites Norwegian Nobel economic laureate Ragnar Frisch when claiming that to save for an individual is something totally different than to save for a nation. He argues that the only way a country can save over time is to develop productive enterprises and real economy, not primarily through international financial investments, which will make Norway a passive rentier.

While the state pushed for the building of a national supply industry on the engineering side it has however, not supported similar efforts in other areas such as law, economics and political analyses. The profits in the petroleum sector, both for private and state actors, have diverted the attention away from apparently

less profitable economic activities and regions without petroleum resources. Norway has realized a professional state regulatory regime for the petroleum industry – and a professional industry – but has not similarly developed a unified updated national conception of production levels, the size of the petroleum fund, how the money in the Fund is eventually to be used to development a diversified economy, culture and knowledge.

In the build-up phase of the Norwegian petroleum industry such combined policies were extensively utilized by the political entrepreneur to the intended benefit of Norwegian companies and the state itself, together with interventionist measures towards companies and markets, cf. Chapter 2. The significant exogenous shock experienced by the Norwegian state when petroleum resources were found reinforced the argument that it had to act more actively and discretely than in a situation where exogenous change was more moderate or incremental. In the face of the petroleum discoveries, responsible policy was at the time thought to require dramatic (discrete) decisions, not to behave as if nothing had happened in a business-as-usual mode. Facing the dramatic growth in the Petroleum Fund for which Norway has not put down labor or capital (it is the accumulation of economic rent from the NCS and returns on international financial investments), elements of discrete entrepreneurial actions could be considered again. For example to upgrade society as a responsible response to the new dramatic exogenous change the growth of the Fund represents, if the spirit of the Norwegian petroleum entrepreneur is to be followed

The vision to build a Norwegian petroleum sector from nothing with the goal of benefiting the entire nation was a prerequisite for policy to succeed. A unifying updated vision must also today be accompanied by a long-term national strategy where the petroleum revenues are secured against different factors, actors and mechanisms. In particular, the domestic economy can not absorb too much use of “petro-money”, interested persons and bodies legally or illegally should not appropriate the revenues from the society. At the same time, revenues should (also) be used to finance the long-term building of alternative domestic sectors, and support the development of “Porterian” infrastructure in a wide sense; social security, roads, rails, air, harbors, research and development, culture etc. Norway can once again however, not copy the vision or policy from other countries with

which they are often compared. Like in the build-up phase of the oil and gas industry, it must act autonomously as a significant European petroleum state, which is a small-state in most other relations. In this context a lot can be learned from the experiences of the state's political petro-entreprise.

#### **6.4 Contribution to understanding the Norwegian – EU relationship**

The EEA agreement involved transferring sovereignty from EFTA countries to ESA and the EFTA court and through these *de facto* to the EU. The three EFTA-countries having signed the treaty can take part in preparing cases through participation in EU committees that propose new rules or changes existing rules. The EU however makes the final decision alone, with no vote from EFTA countries; the EU is the policy-maker and Norway the policy-taker. This causes logical discontent in Norway over questions of democratic legitimacy, transparency and accountability in her relations with the EU, both among those favoring and not favoring full Norwegian membership.

As discussed in Chapter 3.1, in spite of the important content of the EEA agreement in economic, legal and institutional terms it has never really settled down politically. The EFTA lost much of its identity with the agreement while at the same time the EU developed much more rapidly in scope and width in policy domains outside the jurisdiction of the EEA than expected. Only Liechtenstein, Iceland and Norway remain in EFTA as EEA countries, and the fourth member Switzerland has not signed the EEA agreement. The agreement comprises today substantially fewer countries than those who negotiated its terms. The three states have however taken on board 3-4000 legal acts of the EU Single Market regime, as of 2007, and implemented them into national law. The reduction in the number of countries in the EFTA and the huge enlargement in the number of countries in the EU from Central and Eastern Europe have made the EEA a smaller part of the EU's wider European agenda. In addition, the EU itself has changed with the introduction of the monetary union and the development of new competence in foreign, security and defense policy, justice and home affairs. Norway must consequently relate to the European integration processes

including new policy areas outside the EEA agreement (such as Schengen). The EEA is not always the right forum for dealing with new policy areas with different roles for the Commission, Parliament and Council according to the pillar concerned.

The importance of the interaction between domestic and international factors, actors and mechanisms and the adaptation to these has been central to the scope of this study. Norwegian natural gas entrepreneurship has been, and is, affected domestically through law and regulations through the EEA agreement, as well as by “external” EU market liberalization processes, and their interaction. The lesson was that policy only becomes coherent if the government is able to interact simultaneously on both domestic and international tables, as outlined theoretically in Chapter 1.6. The rearrangements of and challenges to the NGF, as a response to EU demands and downstream changes, cf. Chapter 2.5, 3.4-6, 4.8 and 5.6, showed how important the interaction between domestic and international measures were for maintaining and even enhancing nationally defined goals. Paradoxically, the greater the degree of autonomy a country chooses in an economically integrated world, the less influence the country will possess over its own situation, as international competition rules and market mechanisms in many situations *de facto* to a large extent will overrule (irrelevant) national decisions, and the country is increasingly “pushed around” and left to adaptation.

At the same time, the economic rationale of trade liberalism with a need of institutions and policies to adjust to the need of economic actors and processes, supported by a neo-functionalist view of EU integration, indicate that lower levels of integration push for higher levels of integration in order to make it work. For Norway, as for other EEA countries (EU27 + EFTA – Switzerland), it will over time be increasingly more difficult not to reach agreements that further integration. The reversal of integration is costly while deeper integration gives a country aggregated net economic benefits (although income distribution changes). In general, and not least in the energy sector, there are however diverging approaches contrasting the neo-functionalist view, concerning to what extent it is the EU or EU member countries that (will) make policy within the Community, cf. Chapter 1.3 and Chapter 5.2. Neo-functionalists (together with

constructivists) point to the potential for further integration, while institutionalists and intergovernmentalists are more skeptical. Hence, member states may not necessarily transfer all power to Brussels in handling their needs or in other situations; thus securing their own relative political independence. Each country can wish to realize its own interests, rather than primarily being concerned with the situation for the entire Community; to the extent that these goals contradict each other. This means that Norway must have active policies, both towards the EU and EU countries, and possibly also towards regions in relevant policy areas.

As outlined in Chapter 3.1, Norway ending up as full participant in the Single Market, but not as full member of the Union, means that she entered a position with scope and strength of integration with the EU that was different compared with the core EU countries. Participation in the (international and) European trade system is pressuring all European countries economically and politically towards the core, where integration is deepest. The potential for influencing EU decisions can in an inter-governmental view of EU developments however, be made as much through national governments sharing Norway's views and interests as directly through EU institutions. From such a perspective, the importance of the lack of the right to participate in relevant final EU decision making (as the EEA agreement describes) can be modified, albeit not abolished.

The EEA agreement was for Norway not signed to defend petroleum interests, but for securing the interests of the rest of her economy. Strictly speaking, Norway did not need an EEA agreement to sell gas to the EU. It is the rest of the economy that had/have major economic interests in terms of obtaining market access and rules of fair competition. *Ceteris paribus*, it might have been better for Norway not to have natural gas activities included in the agreement, if maintaining as largest possible maneuvering room for national gas entrepreneurship was the only goal. However, the integration process required that singular interests are balanced against other economic interests. Due to the passive character of the EEA agreement, Norway's influence on EU policy, in spite of the comments in the previous paragraph, is limited compared to member countries. If Norway were to become an EU member and achieve the right to influence the formation of regulations, she might contribute in shaping them in

her favor. If a trade agreement was the alternative (as Switzerland) she could explicitly have tried to exempt natural resource management as far as possible. Both membership and the trade agreement alternatives appear as better general political frameworks for the state's natural gas entrepreneurship than the EEA agreement. This may also be true for the rest of the economy, and at least in a democratic dimension.

Furthermore, following Katzenstein's (1985) argument that small countries can more easily adjust to changes because it is easier for them to reach consensus oriented decisions in corporate domestic structures, indicates that a small country could potentially be more dynamic than bigger countries or the EU system in her decision making. The EU system in particular is a weak "state", as she must continuously compromise interests across countries and this may delay and weaken decisions. In spite of the obvious power imbalances between the EU and Norway, policy outcomes depend consequently on more than just the legal, economic and political "meat weights", as demonstrated by the Norwegian adaptation to the EEA when adjusting her NGF, cf. Chapter 3.

The study also argued that as the EU has changed a lot over the past decades, it may continue to change strongly also in the future. If the EU becomes more interventionist towards economic activities in the future, it will not break with the overall idea of the Union. The liberal economic model can be interpreted within a "variety of capitalism" as phrased by Hall and Soskice (2001). The model that the EU develops into depends both on circumstance, ideological perspective and intra-EU developments, and will contribute to defining the maneuvering room and policy options for the Norwegian state, as well as its economic activity in general.

The arguments of this study indicate that the *relative* ability to develop policy is important for a country seeking to remain competitive or in more general terms, reach the goals it has set. A neo-Schumpeterian understanding of trade and international competitiveness supports the significance of the role of national policy making. The understanding of integrating partners' motives and policies, and trying to always stay ahead to influence these as well as make precautions and strategies that avoid problems and exploit opportunities, are important,

rather than just copying the others' laws and regulations in a passive manner. In integrated economies traditional trade (and exchange rate) policy measures must however be replaced with "hidden" barriers and influence, and national interpretation and adaptation to common rules and regulations, at the same time as formalities are adhered to.

This parallels what Posner (1961) identifies as respectively innovative and imitative countries and industries in technological and commercial change, where the continuous ability to innovate is the driving force for the leading country as it maintains its lead (and the highest economic standards), compared to a possibly more passive (imitating) political attitude. The lesson from this study is that it can be the dynamism of technological, commercial *and political* ability to innovate through new regulations, politics and attitudes that remains decisive for the *de facto* effects of formal and informal integration with the EU, and the political freedom of action, more so than the choice of relevant formal agreements with the EU that Norway is offered.

## 6.5 Theoretical implications

The study has utilized endogenous growth theory to understand the role of the Norwegian state as political entrepreneur in creating her petroleum industry, and the disciplines of economics and political science within an IPE framework to understand EU integration processes and their impact on national policy making. We have argued that this approach has contributed to the understanding of how the EEA agreement and the liberalization of EU markets for natural gas have challenged and changed the Norwegian state's natural gas entrepreneurship since the 1990s through legal, economic and political factors and mechanisms. It was contended that the strength of the approach was the manner in which it provided an improved understanding of relationships at an aggregated level. On the other hand, its weakness was more or less exact outcomes as produced from single economic or political theories and methods might be lost. However, undisciplinary analyses from both economics and political science were applied when considered appropriate, and combined in a multidisciplinary fashion. A last question in this study is the extent to which the analysis has contributed to an

understanding of entrepreneurship and international political economy in more general terms.

Most studies of private entrepreneurship have had a limited focus on the political economy of entrepreneurship, not to say on the main focus in this study; political entrepreneurship itself, as outlined theoretically in Chapter 1.1. Endogenous growth theory has mostly been appropriated to study private entrepreneurship (as demonstrated in Fagerberg, Mowery and Nelson 2005). The characteristics of a political entrepreneur are in this study found to share many similarities with the private entrepreneur, as he enters into the role of innovator and leader of economic change. A political entrepreneur can however define social (as opposed to private) goals for economic activities and use regulative, legal and political measures to reach goals that a private entrepreneur does not have at his disposal, as outlined empirically for the NGF in Chapter 2. The study has shown that to extend the use of endogenous growth theory also to understand the role of a political entrepreneur, as defined, is possible and can be fruitful. It can also be highly relevant to further the understanding of private entrepreneurship in mixed economies, as a political entrepreneur is framing activities for private entrepreneurs as regulator and policy maker, and interact with the private sector through partnership schemes etc. It is the dynamism of technological, commercial and political ability to innovate that is decisive for a company's, as well as for a country's, competitiveness.

Different studies of EU and European integration processes, being uni-, inter- or multidisciplinary as outlined in the Introduction Chapter, include discussions about how participating nation states are affected by economic integration. In the field of economics, discussions generally follow neo-functionalist and liberal market logics of how institutions and policies change when a country enters into deeper levels of integration with other countries. The political approaches often contrast or complement this view with various degrees of intergovernmental, institutionalists and constructivist understandings of the political development of the EU. Such perspectives attempt to explain whether or not, and if possible how, nation states influence the EU. The international political economy approaches combine economics and political science analyses in an international setting, comparing the different perspectives from the two fields on how to understand

economic integration processes. These unidisciplinary and cross-disciplinary studies of EU and European integration together represented the backdrop for an understanding of the effects and dynamics of political economy of European integration, as outlined theoretically in Chapter 1.2-6. By combining economic and political approaches it was for example possible to find a more realistic description of and set of reasons for the EU gas market remaining imperfect and politicized, cf. Chapter 5. This enhanced the understanding of market mechanisms and outcomes compared to an analysis relying mostly on economic theory, cf. Chapter 4.

The empirical chapters in the study demonstrated that it is necessary to understand how qualitatively different factors, actors and mechanisms influence both EU integration processes and the entrepreneurship. Multifaceted and dynamic economic, political and legal factors are required to understand the effects of European integration processes on the maneuvering room and policy options for a national political entrepreneur. Other studies of Norwegian-EU natural gas policy have used both disciplinary and interdisciplinary approaches, cf. the Introduction Chapter. None of these have however applied endogenous growth theory to understand the political entrepreneurship of the Norwegian state in creating and developing her petroleum and natural gas activities, cf. Chapter 2, and consequently not combined this understanding with multidisciplinary ways of analyzing empirically how the interaction between economics and politics in EU integration processes affect the political entrepreneurship, cf. Chapters 3-5.

So what are more precisely the similarities and differences between economics and political economy found in this study? When analyzing EU economic integration processes, the economics approach was mostly concerned with the integration of markets, while the IPE approach was more concerned with the interplay between economics and politics in processes that never end, involving regulations, international affairs, institutional change etc. The IPE approach can be said to be primarily concerned with the integration of and compromise between *systems* and ideology in mixed economies, rather than in only markets.

As to the goals of economic integration, the economic analyses emphasized wealth creation, economic efficiency, lower prices and the benefits of competition, as outlined empirically in Chapter 4 for the natural gas sector. The IPE approach added that economic integration promotes political integration with its stabilizing effects on international relations. These are the two main schools of thought for the foundation of the ECSC and the EU itself, cf. Chapter 1.2. The IPE approach also argued that winners of domestic and international interest conflicts also can define goals, cf. Chapter 1.2, 1.6, 3.3, 4.2, 5.2-3 and 5.5. The IPE maintained that the increased political interdependence created by economic integration makes the degree of common institutions and harmonized policy important, and it also continuously changes the domestic maneuvering room and policy options for participating nations. However, the IPE approach did not contradict the economics approach, but rather added more dimensions in order to propose its modification and a closer fit to reality. As such the economic approaches used in this study represent an input into a more comprehensive IPE understanding of relations.

When discussing the forces and factors that influence the integration processes, the economic approach concentrated on trade barriers in terms of negative and positive integration, trade flows and prices. The perfect market was largely a reference point for the analysis, where the state was to intervene when markets were imperfect, inhibited externalities or the income distribution was considered erroneous by an exogenous actor (as for example politicians). The IPE approach added to this that power relations, institutions, legal bindings and economic and political spill-over effects are also important to an understanding of market mechanisms and outcome. The outcome of a perfect market (if necessary adjusted by economic policy to repair for imperfections) may and may not be seen as the only goal, but primarily one out of several possible outcomes. Relations to other states and intra-state power relations were important and politicized in the process. These differences were outlined theoretically in Chapter 1, and Chapters 4 and 5 demonstrated empirically how they might help understand EU market liberalization processes. The discussion of the impacts from the EEA agreement in Chapter 3, also showed rather different results when the Norwegian state behaved as a regulatory innovator in response to EU

demands, as opposed to if it just passively followed them and their microeconomic foundations.

The role of state in the economy also varies between the two approaches. The economic analysis emphasized that economic integration leads to more decisions made by independent market actors under proper non-discriminatory regulations, and less state involvement, although possibly more international regulations, as outlined by the neo-functional school, discussed theoretically in Chapter 1.3 and empirically for market design in Chapter 4. The IPE analyses, and empirical findings for the NGF in Chapter 3, demonstrated on the other hand that the result can also be more direct participation in economic activities from the nation state, when national interests are to be defended. Hence, an IPE approach questions how a liberal economic system *de facto* might be understood and designed, cf. the “variety of capitalism” debates. In addition, the IPE approach also questioned whether an economic integration process must follow liberal economic and neo-functional linearity in its development, or rather the inter-governmental view that nation states continue to be the main actors in the processes.

Taken together, the study has eclectically brought together the dynamics of and between markets for both “normal” goods and services and for non-renewable natural resources, logics and constraints from international affairs and security-of-supply, bargaining processes, and the interaction between domestic and international affairs. If only economics had been used for the analyses, a most important understanding of power relations and political processes would have been lost. If only political science had been used, an important understanding of the dynamics of market mechanisms and their imperfections would have been lost. Several types of explanatory variables were pulled together, with the goal to yielding a better understanding of the impacts of the EEA agreement and the strongly imperfect and politicized EU gas market liberalization processes upon the challenges faced by the Norwegian state as a natural gas entrepreneur.



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Aarrestad, Jostein, 1979: "Resource Extraction, Financial Transactions and Consumption in an Open Economy." *Scandinavian Journal of Economics* vol. 81. pp.552-565.

This book analyzes how Norway's integration with the European Union has contributed to change the Norwegian state's oil and natural gas entrepreneurship from the 1990s. The point of departure is that the Norwegian state was engaged in her petroleum industry from the 1970s as producer, regulator, law-maker and political and economic risk-taker. As a political entrepreneur the state could define social goals for activities and use regulative, legal and political measures to reach goals that private entrepreneurs do not have at their disposal. The European Economic Area (EEA) agreement challenged and changed the way the Norwegian state could continue the control and innovation of her comprehensive petroleum model. Norway adapted eventually de jure to EU directives and competition law. At the same time she gave their contents and interpretations a de facto Norwegian flavor. The analysis sheds some light on European integration and variations in regulatory reform, and should be useful to people in academia, governments and regulatory authorities, professionals in the energy industry, as well as the general public.

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