Emissions Trading and Statkraft

How EU climate policy has affected Europe's largest renewable energy company

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Master Thesis

Department of Political Science

Faculty of Social Science

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Summary

The issue of global climate change is increasingly impacting on the power sector in Europe. This in-depth company case study examines how the EU Emissions Trading Scheme (EU ETS) has affected the Norwegian power company Statkraft – Europe's largest producer of renewable energy. The study assesses whether and how Statkraft's climate strategy changed in the period 2003–2009, evaluated on a continuum from 'defensive' to 'indifferent', 'offensive' and 'innovative' climate strategies; and how the EU ETS has influenced these changes. Statkraft's climate strategy emerges as increasingly 'offensive', due not least to the company's long-term plans for expansion in flexible and renewable energy sources. The reasons for not classifying Statkraft's climate strategy as 'innovative' relate to the company's focus on old renewables and the limited emphasis on innovation in new climate-friendly technologies. The explanatory framework builds on the multi-level governance approach, examining how factors from the EU, national and company levels influence climate strategies through mechanisms of risks and opportunities. The literature to date has focused on how external factors influence corporate climate strategies. This thesis finds that expectations of a more stringent and predictable EU ETS, together with perceptions of complementary EU climate goals and other policies, have provided Statkraft with a solid strategic framework for an offensive climate strategy. However, the ownership and renewables policies of the Norwegian authorities have had a restraining effect, making it harder for Statkraft to adopt an innovative strategy in the short or long term. To fully explain changes in Statkraft's climate strategy, the study utilizes a third perspective: examining factors in the company itself. Statkraft's corporate identity, shaped before the introduction of the EU ETS, relies heavily on technological specialization, well-established renewables and the role as Europe's peak supplier. Despite some internal attempts to change this identity by focusing on innovation, new market opportunities and portfolio diversification, efforts have been too few and random for Statkraft to be termed 'innovative' in the sense applied in this thesis. The major analytical implication of this study is that accurately understanding changes in corporate climate strategies requires drawing on explanatory factors from different levels – company-specific factors in particular. Further in-depth company studies are essential for fully understanding the effects of climate change regulations.

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Anne Raaum Christensen,

Polhøgda, Norway, December 2010

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List of Abbreviations

BSA	Burden-Sharing Agreement
CDM	Clean Development Mechanism
CEO	Chief Executive Officer
CER	Certified Emission Reduction
CO_2	Carbon dioxide
ET	Emissions Trading
EU	European Union
EU ETS	EU Emissions Trading Scheme
GHGs	Greenhouse Gases
IPCC	International Panel on Climate Change
JI	Joint Implementation
KP	Kyoto Protocol
NAP	National Allocation Plan
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
R&D	Research and Development
SVP	Senior Vice President
MLG	Multi-level governance
EUA	European Union Allowance
SHP	Small-scale hydropower
GFPP	Gas-fired power plant
CSR	Corporate social responsibility

1. Introduction

1.1 Purpose and research questions

The EU's extremely ambitious energy- and climate targets are inspiring,
and at the same time, establish a firm strategic framework for Statkraft's activities.
The target of reducing greenhouse gas emissions by at least 20% by 2020
suggests that the European emissions trading scheme will be of critical importance
to the development of the power industry in the future

(Message from the CEO, Statkraft Annual Report 2007:8)

The issue of global climate change is increasingly impacting on the power sector in Europe. Greenhouse gases (GHGs) like carbon dioxide (CO_2) are widely recognized as contributing to climate change, and power generation represents the bulk of industrial emissions of CO_2 in Europe. Various policy instruments have been introduced to contribute to a transition to a less carbon-intensive energy system. This presents the power sector with a range of new challenges and risks, but many new opportunities as well. The power sector as a whole must find a way to meet the growing demand for energy and at the same time reduce overall CO_2 emissions from the sector. The ways in which power companies respond to these changing framework conditions can be found in their *climate strategies.* With growing regulatory and public pressure, the climate strategies of power companies are starting to change.

The cornerstone of climate policy in the European Union – and a novel approach to environmental regulation is its emissions trading scheme (the EU ETS) introduced in 2003. Under the EU ETS, large emitters are required to buy and sell permits to release CO_2 into the atmosphere, and a market for carbon has thus been created. There are, to my knowledge, no studies that examine how the EU ETS affects the climate strategy of companies with an energy portfolio based mainly on *renewable* energy sources. Thus far, priority has gone to studying how the scheme affects large emitters, to see whether and how the EU ETS leads to actual abatement and innovation. I propose to go one step further, and investigate whether the emissions trading scheme in particular, and the rest of the EU's climate policy in general,

has affected 'greener' power companies. The state-owned Norwegian company Statkraft is a good example here, as it has been Europe's largest renewable energy company since 2008[1] (Statkraft Annual Report 2009). Statkraft is in fact quite a unique case in the European context, as an overwhelming majority of European power companies have a fuel-mix based on carbon resources and/or nuclear energy. Statkraft added non-renewable sources of energy to its portfolio (gas) in 2007, so some of the company's installations have been covered by the EU ETS in recent years.

Why should it be reasonable to expect that a company mainly based on renewable energy sources will be affected by a CO_2 emissions trading scheme? First of all, the power sector as a whole is affected when a market and a price on carbon are established, as that puts a pressure on the costs of producing fossil-based energy. This can lead to changes in what are considered as the most cost-efficient sources of energy. Secondly, the carbon price is expected to pass through to electricity prices, affecting the revenues and investment basis for all power companies. Thirdly, an open carbon market creates possibilities for trade in new commodities and new forms of risk management. All in all, the aim of an emissions trading scheme is to reduce the emissions of CO_2, and that in turn can be expected to provide more room and possibilities for companies like Statkraft.

In this thesis I inquire into how the EU Emissions Trading Scheme has affected Statkraft's[2] climate strategy. The following two main research questions will be examined and discussed:

1. **Has Statkraft's climate strategy changed in the period 2003–2009? If so, how?**
2. **To what extent and how has the EU ETS influenced these changes?**

The timeframe for this study is the period from 2003 to 2009, as the EU ETS was formally adopted in 2003. The scheme, however, had been anticipated for several years, and it is

[1] When the EU ETS was adopted in 2003, Statkraft was the Nordic region's third largest electricity producer, and Europe's second largest producer in terms of renewable energy sources (Statkraft Annual Report 2003).

[2] The Statkraft Group is active throughout the world through the parent company Statkraft AS and a number of subsidiaries. Statkraft AS is formally owned by Statkraft SF, a holding company directly subject to the Norwegian Ministry of Trade and Industry. Statkraft AS' activities outside of Europe can mainly be found in SN Power, a company where Statkraft since 2002 owns 50% (60% since 2008). When talking about "Statkraft" in this thesis I am mostly referring to Statkraft AS, including the most important subsidiaries (Statkraft Energi, Skagerak Energi, Trondheim Energi, Statkraft Agder Energi Vind, Fjordkraft, Småkraft and Naturkraft). Due to feasibility concerns, SN Power is not studied in this thesis.

hence possible that the EU ETS led to changes in climate strategy before 2003 as well[3]. The year 2009 is a natural end-point for me, as that was when the work on this thesis started, but developments in Statkraft and the EU in 2010 are briefly discussed in the epilogue.

While 'changes in climate strategy' has been chosen as the dependent variable in this thesis, the second research question shows that the most interesting explanatory factor is considered to be the EU ETS. This scheme can have both short- and long-term influences on corporate climate strategy, and the effects of the EU ETS may be both specific and diffuse. 'Specific' effects refer to effects stemming from the scheme seen in isolation, whereas 'diffuse' effects come about because the EU ETS is a part of a bigger picture: the EU's climate and energy policy and a general worldwide shift towards renewable energy and a greening of business strategy. It is highly likely that the EU ETS has not been the only factor influencing Statkraft's climate strategy in the period 2003–2009, so other explanatory factors from EU, national and company levels will be explored as well.

This topic of study is highly relevant for a master thesis in political science, as we need to know more about how climate policies actually work. The EU ETS is a market that has been established through political processes, and the effects of this market are thus a product of political decision-making and the interests of various actors. Studying the consequences of EU ETS entails studying how a particular policy instrument is used to influence and change the behaviour of companies, and how such an instrument works in combination with other regulations and policies.

1.2 Climate change policy and the power sector: a snapshot

Climate change is considered to be one of the most serious challenges facing humankind in the 21st century. The UN Intergovernmental Panel on Climate Change (IPCC) has concluded that we will experience considerable changes in global average temperatures and climate systems in the years to come, and that these changes are very likely due to the observed rise

[3] A cap-and-trade programme was first suggested as an important component of the European Climate Change Programme in a Green Paper issued in March 2000 (Commission 2000). A concrete and specific implementing directive was proposed in October 2001 (Commission 2001).

in anthropogenic (human-caused) GHG emissions (IPCC 2007). According to the IPCC (2007:67), global GHG emissions will have to be cut by more than 50% by 2050 compared to 2000 levels for there to be a fair chance of avoiding an average global temperature rise of more than 2°C. To reduce the emissions of CO_2 and other GHGs, various policies are being introduced and implemented at several levels of policy. The Kyoto Protocol (KP) – a protocol to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) – was adopted in 1997, and entered into force on 16 February 2005 (UN 1992; UN 1998). Under the Protocol, 37 industrialized countries ('Annex I countries') commit themselves to collectively reduce various GHGs by 5.2% from the 1990 level in the period 2008–2012 (UN 1998). The Protocol opens up for the use of 'flexible mechanisms' such as emissions trading to help Annex I countries meet their commitments.

The European Union as a whole pledged to reduce its emissions by 8% under the KP, and in 1998 it adopted a 'Burden Sharing Agreement' (BSA) (see e.g. Commission 2000). This agreement divides the burden of reaching the 8% goal unequally among the EU member states, as some are in a better position to reduce emissions than others. In the wake of the Kyoto Protocol and the BSA, the European Union adopted a common emissions trading scheme (the EU ETS) in 2003. This is the world's first multi-country greenhouse gas emissions trading system, and has been referred to as a 'grand policy experiment' (Kruger and Pizer 2004:1). The scheme is seen as the cornerstone of the EU's climate policy (Commission 2005), and as a major policy instrument affecting the business sector all over Europe. Norway, a non-EU member, linked its cap-and-trade system to the EU ETS in 2008 (Klif 2010). It is essential that the EU ETS should work effectively and as intended if the member states are to meet their Kyoto targets, as well as the targets likely to come with a post-2012 international climate regime. The EU ETS is also considered to be a central element in the EU's strategy to reach its self-imposed goal from 2007 of a 20% reduction of GHGs by 2020 (Council 2007).

The EU ETS is a company-level scheme, covering more than 10,000 installations which are collectively responsible for almost half of the EU's CO_2 emissions, and 40% of its total GHG emissions (Commission 2005). The EU ETS started in the period 2005-2007, and continued with the so-called 'Kyoto-phase' from 2008-2012. The scheme's third phase is planned for 2013-2020. The aim is to get companies to reduce their emissions by providing them with flexibility to choose compliance strategies under a politically-set cap on emissions. By

establishing a price on carbon the EU ETS is expected to reduce emissions and spur low-carbon investments. The power sector constitutes the largest share of CO_2 emissions covered by the ETS, and it plays a key role in both emission reductions and future innovations. There exist many low-cost CO_2 emission-reduction opportunities within this sector, and the effects of the EU ETS have been subject to several studies on the aggregate level in recent years (see e.g. Hoffmann 2007, Gullberg 2008, Rogge et al. 2010). However, there have been very few in-depth studies of the effects on one particular company, or just a few companies. We need in-depth case studies to identify the mechanisms through which the EU ETS influences companies and to get a more comprehensive understanding of the consequences of the EU ETS. In-depth studies are also suitable for seeing how the EU ETS interacts with factors from other policy levels or from within the company itself.

1.3 Existing research

This section will highlight how this thesis can contribute to the research on effects of the EU ETS. What studies have been conducted thus far? What questions now need to be posed and answered?

Existing studies of the EU ETS can be divided roughly into three categories: context and history, specific design elements, and the general effectiveness and impacts of the scheme. The studies have mostly been conducted by economists, and extensive EU ETS literature reviews can be found in Convery 2009 and in Asselt 2009.

The context and history of the scheme has been thoroughly covered by Skjærseth and Wettestad (2008a), building on earlier and valuable works of authors like Lefevere (2005) and Delbeke (2006). These contributions are essential for getting an overview of why and how the EU ETS came into being. Most EU ETS studies take one or several specific design elements as a starting point, and seek to evaluate the choices available under the Emissions Trading (ET) Directive, regarding scope and coverage, cap-setting, allocation method, rules for new entrants, access to Clean Development Mechanism (CDM) and Joint Implementation (JI) credits and so on. The issue of cap-setting has led to many studies examining the level of the cap and the alternative methods of calculating it (Asselt 2009:39), while the method of

allocation of allowances has triggered a 'free allocation' vs. auctioning literature (Convery 2009:125).

The third strand of literature is concerned with crosscutting issues that relate to the functioning of the EU ETS as a whole (Asselt 2009:49). The first generation of these studies naturally focused on the *expected* effects, trying to predict how the EU ETS would influence sectors covered by the scheme. Gagelmann and Frondel (2005) using empirical evidence from US trading schemes for SOx and NOx, concluded that, in the pilot phase, the innovation effect of the EU ETS was likely to be limited. Schleich and Betz (2005) arrived at similar conclusions, adding that the uncertainty of future allocations also jeopardized the innovation effects of the scheme. The issue of uncertainty was also underlined by Egenhofer et al. (2005:16), who concluded: 'It is more likely than not that there is too much uncertainty in this initial stage around the EU ETS for it to harness new investments.'

The second generation of these studies started with the ex-post evaluations after 2007, when the first trading period was over. Researchers started to ask: Has the EU ETS lived up to its promise as a cost-effective tool? (Egenhofer 2007) Has the scheme actually led to emissions reductions? (Ellerman et al. 2010) Does the EU ETS spur innovation? (Hoffmann 2007). This thesis will not try to evaluate the effectiveness of the scheme as such, but will focus on the consequences and effects on individual companies.

Empirical ex-post evaluations of the actual effects of the EU ETS on sectors and firms are still limited, as the scheme has only been up and running a few years. There are some studies analysing the effects on the power sector as a whole, but studies looking in-depth at one or just a few particular companies are virtually non-existent. Hoffmann (2007) studied the effects of the EU ETS on energy technology investments in the German electricity industry, and found little empirical evidence of the actual effects on corporate investments decisions. He did, however, find that companies in the sector had started to integrate costs for CO_2 in their investment decisions, and that the effects on small-scale investments were larger than for large-scale investments. A study conducted in Japan the same year (Ikkatai et al. 2007) confirms this picture – the EU ETS led to greater awareness in the companies affected, but had little effect on their abatement efforts during the initial period. Karoline S. Rogge and Volker H. Hoffmann (2009) and Rogge et al. (2010) look at the innovation effects of the EU ETS in the power sector in Germany, and conclude that this impact has been limited so far;

'[…] because of the scheme's initial lack in stringency and predictability and the relatively greater importance of context factors' (Rogge et al. 2010:ii). The impact has been greatest within the large-scale coal-power generation technological regime, where the EU ETS to some extent affects the rate and direction of technological changes (Rogge and Hoffmann 2009:20).

Summing up, the ex-post studies conducted so far have mainly three things in common:

1. They focus on the power sector as a whole (often in one country), not specific companies.

2. They focus on the part of the energy sector with high CO_2 emissions and direct emissions limitations under the scheme.

3. They limit their studies to the effects of the EU ETS on one particular aspect of the firm, e.g. innovation or investments.

In this study I focus on only one company, Statkraft, in response to the call for in-depth case studies of specific companies:

> Since our innovation system analysis identified the relevance of corporate actors, our research should be extended by in-depth case studies of power generators and technology providers. This should examine technological and firm-level differences as these appear to have high explanatory power (Rogge and Hoffmann 2009:21).

As argued earlier, I also think it is important to extend the existing research to studies of power generators with an energy mix based mainly on renewables. When the EU ETS was adopted in 2003, Norway was a special case in Europe, unique in that almost all of its electricity supply was derived from its abundant hydropower resources. Thus, the electricity sector in Norway did not expect to be the direct subject to the new scheme. They did, however, anticipate being affected, as indicated by this statement in Statkraft's 2003 Annual Report:

> Even though Statkraft does not emit any greenhouse gases in conjunction with our hydropower and wind power production, the ETS will indirectly affect the price of power we produce and ultimately the value of our assets as well (Statkraft Annual Report 2003:18)

Finally, I will not limit this study to only one aspect of Statkraft's business (like innovation or organizational changes), but will examine the effects of the EU ETS on Statkraft's climate strategy in general. Few studies have considered the effects of the more stringent second

trading phase (with Rogge and Hoffmann 2009, 2010 and Rogge et al. 2010 among the important exceptions). My thesis will include the effects of this phase, as well as effects resulting from the expectations as to the revised post-2012 scheme.

1.4 Research strategy

The dependent variable in this thesis is "changes in climate strategy". Based on Ulrich Steger's (1993) typology for environmental strategies, I present a four-step continuum for corporate climate strategies, with the steps labeled 'defensive', 'indifferent', 'offensive' and 'innovative'. To determine which category Statkraft belongs to, I assess the degree of climate-related changes in four inter-related areas: overall corporate vision and strategy, organization, investments and innovation.

The most interesting independent variable in this thesis is the EU ETS – both in a specific and diffuse sense. The EU ETS is expected to influence Statkraft's climate strategy through two main mechanisms: risks and opportunities. In order to isolate the effect of the EU ETS, we need to look into other factors as well that might affect Statkraft's climate strategy. With the multi-level governance approach as a starting point, I examine factors on the EU, national, and company levels to explain changes in climate strategy. I have developed hypotheses on the expected relations between factors from all these levels on the one hand, and changes in Statkraft's climate strategy on the other.

These propositions will be assessed empirically mainly by means of process tracing – connecting causes and effects by identifying various mechanisms. This study is based on assessments of central documents and thirteen interviews with corporate representatives and other key informants.

1.5 Thesis outline

This study consists of nine chapters. Chapter 2 develops a theoretical and analytical framework, based mainly on a continuum of climate strategies and the multi-level governance approach. Chapter 3 describes the methodological approach chosen and the sources of data employed, with particular attention to the challenges of interviewing elites.

Chapter 4 presents relevant background information: What is the EU ETS, and how has the scheme developed since being adopted in 2003 (section 4.2)? What sort of company is Statkraft, and how has it evolved since the Norwegian state begun its engagement in the power sector early in the 20th century (section 4.3)? While section 4.2 is necessary to grasp why and how the EU ETS can be expected to affect the power sector, 4.3 provides essential background for understanding Statkraft's identity in the 2000s.

The bulk of this study is found from chapter 5 onwards. I find an answer to the first research question in chapter 5, as I present the empirical data gathered to describe changes in Statkraft's climate strategy in the period 2003–2009. The main finding in this chapter is that Statkraft has adopted an increasingly offensive climate strategy. Chapters 6, 7 and 8 have the combined aim of explaining these changes in Statkraft's climate strategy, with chapter 6 focusing on the EU/EU ETS influence. The findings in chapter 6 are discussed in light of national and company factors in chapters 7 and 8, respectively. From the analysis in these chapters, we will see that the EU ETS and the wider EU climate policy have been factors that have supported and reinforced Statkraft's offensive strategy, especially the strategy related to long-term objectives. Norwegian renewable- and ownership policies has had a moderating effect in the short term, whereas factors from within the company can explain why Statkraft has not adopted a more innovative climate strategy. Concluding remarks as well as some thoughts on possible further research on the topic are offered in the final chapter.

2. Theoretical framework

This chapter outlines the theoretical framework of the empirical analysis. First, I focus on the dependent variable in this study: changes in Statkraft's climate strategy. I define the concept climate strategy, and continue by presenting a continuum of different climate strategies ranging from 'defensive' to 'innovative'. Second, I develop a framework for understanding a company's choice of climate strategy, based on the multi-level governance approach. In addition to factors at the EU level, factors from the national and company levels are also expected to be important in explaining strategy changes.

2.1 Changes in Statkraft's climate strategy

The focus for explanation in this study is 'changes in Statkraft's climate strategy', as it is expected that most effects of the EU ETS can be found in the establishment of, or changes in, such a strategy. By 'a company's climate strategy' is meant:

> A pattern of decisions over time that determines a company's goals and values concerning the problem of climate change and/or regulation, and the actual mobilization of resources to achieve those goals and exercise those values (Skjærseth and Eikeland, forthcoming)

A climate strategy may be motivated by considerations of the climate-change problem in general, and/or specific climate regulations in particular. It is the overall response of a company towards climate-related issues, and may involve various goals and measures. Regarding this 'pattern of decisions' it is important to note that a climate strategy can be both long-term (goals and plans for the future) and short-term (mobilization of resources and changes in business activities that were actually realized); moreover, that a climate strategy consists of both rhetoric and deeper actual changes. The stated climate strategy and the actual strategy are not always the same. Long-term strategies are expected to be particularly relevant to this study, as climate change is a long-term challenge – especially when it comes to innovation and R&D of new climate-related technologies.

2.1.1 Different climate strategies

The literature on 'climate strategies' is placed within a tradition of studying how companies respond to environmental issues or environmental regulations. To classify these responses, more than 50 different typologies or continuum models have been created, ranging from reactive to proactive corporate behaviour (for overviews of environmental management models, see e.g. Roome 1992, Hass 1996, Rugman and Verbeke 1998, Kolk and Mauser 2002, Kolk and Pinkse 2004, Jeswani et al. 2008, Weinhofer and Hoffmann 2008). These models are generally based on the assumption that firms (should) improve their environmental performance in a pro-active direction (Jeswani et al. 2008:49). Ulrich Steger (1993) has developed an influential and much-cited typology for environmental strategies available to a company, after studying the connection between environmental imperatives and strategic change in companies. He places businesses in one of four categories, depending on their response to environmental risk and environmentally-related market opportunities: 'indifferent', 'offensive', 'defensive' and 'innovative'. Steger's model is not concerned with climate change in particular, but with the general environmental regulations a company could have to deal with. Below, I have transferred Steger's typology to the context of climate change and climate regulations. The following characterizes and distinguishes the four strategies:

1. Defensive: Defensive companies do not accept the problem of climate change, nor the view that sees them as a part of the problem or the solution. They are likely to oppose and resist the climate regulations in question. A defensive company will implement the mandatory requirements only reluctantly, without making any voluntary changes in its organization, investment or innovation policy.

2. Indifferent: An indifferent company does not have, or does not change, its climate strategy as a result of new or changing climate regulations. It does not oppose such regulations, but it has no reason to support them either. No changes in organization will be made, nor in investment or innovation policy. The company will continue on a 'business-as-usual'-path, basically unaffected by the climate issue and/or regulations in question.

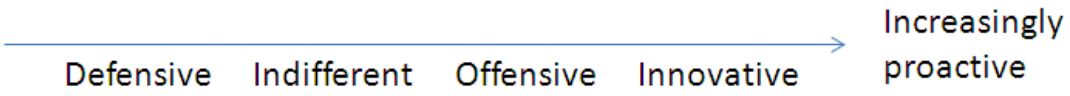
3. Offensive: Offensive companies accept the climate-change problem and support climate-change regulations. They will try to exploit the opportunities inherent in the regulations, but only some changes in organization, investment and innovation policy will be carried out. Offensive companies feel that they are already well 'adjusted' to the reality prescribed in the regulations – but now they can develop more faster/stronger ('more of the same').

4. Innovative: An innovative company will accept the climate-change problem and support the regulations in question, and it will change its business more profoundly than an offensive company. An innovative company will, to a large extent, make changes in its investment and innovation policy, and will go beyond mere compliance. Such a company is likely to change its core activities, and spend more time and money on radical innovation and product development than an offensive company.

2.1.2 A continnuum model from 'defensive' to 'innovative'

This typology can be translated into a continuum from 'defensive' to 'innovative' (see figure 1). The continuum implies a gradual increase from reactive, via indifferent, to different degrees of proactivity with regards to climate-friendly commitments and activities. It may be that Statkraft's climate strategy has changed from one category to another on the continuum, or that its identification within one specific category has been weakened or strengthened in the course of the period under study here.

Figure 1: A continuum-model for different climate strategies



To measure and determine which of these categories Statkraft belongs to, we need clear indicators to capture the total climate strategy of a company. In line with the descriptions of the four categories above, I believe that a mapping of the development in the following four areas in the period 2003–2009 will give a good picture of change in Statkraft's climate strategy:

(1) **Climate-related changes in overall corporate vision and strategy** (e.g. changes in what the company considers as its primary vision, core competitive advantage, core business areas etc.)

(2) **Climate-related changes in organization** (e.g. new organizational units for renewable energy, changes in staff etc.)

(3) **Climate-related changes in investment policy** (e.g. a strengthening or weakening of former, climate-related activities, changes in investments in high- or low-carbon installations, new climate-related products etc.)

(4) **Climate-related changes in innovation and R&D** (e.g. a strengthening or weakening of development of new climate-related technologies)

The first two indicators are concerned mainly with rhetoric and organization – whether the overall corporate strategy and organization have been influenced by climate issues or regulations. According to Julie L. Hass (1996), a common failure of environmental management models is that environmental strategy is studied in isolation from the context of the firm's overall business strategy. I have taken note of this, and will seek to link Statkraft's climate strategy to its wider corporate strategy and organization.

The last two indicators are concerned with the 'realized' climate strategy, as they are meant to capture actual and more substantive climate-related changes. A change in these indicators will express a stronger commitment, as they are concerned with the material dispositions of the company.

I consider the last indicator – climate-related changes in innovation and R&D – to be a measure of the most far-reaching change in a company's climate strategy. Climate-related changes in innovation can prevail to a greater or lesser degree, as a company may choose to scale up technologies based on existing know-how, or opt for radical innovation (Pinkse and Kolk 2010, Jänicke and Lindemann 2010). The former can be labelled 'innovation deployment' as it refers to incremental innovations and the improvement of existing technologies, whereas the latter, more radical, version can be termed 'innovation development'. Innovation development can be seen as a more pro-active commitment to dealing with climate change.

Taking all of these comments into account, I have developed the following continuum model for this thesis. Expected scores on the four indicators for the four climate-strategy categories can be found in Table 1:

Table 1: Expected score on the indicators for each step on the continuum

	DEFENSIVE	**INDIFFERENT**	**OFFENSIVE**	**INNOVATIVE**
Climate-related changes in overall corporate vision and strategy	Stated resistance	None	Partly – largely	Largely
Climate-related changes in organization	None, or only reluctantly	None	Partly – largely	Largely
Climate-related changes in investments	None, or only reluctantly[4]	None	Partly – largely. Focus on low-carbon and/or old renewable energy sources.[5]	Largely. Focus on old and/or new[6] renewable sources of energy.
Climate-related changes in innovation and R&D	None, or only reluctantly	None	Partly. Focus on *deployment* of existing climate-related technologies.	Largely. Focus on *development* of new climate-related technologies.

2.2 Explanatory perspectives

To what extent and how has the EU ETS influenced changes in Statkraft's climate strategy? To be able to answer this second research question, I have developed a framework for explanation based on the multi-level governance approach. Statkraft's climate strategy is

[4] A defensive company could however choose to invest in anti-lobbying campaigns against climate regulations, and in that case those expenses could be regarded as changes in investments.

[5] This divide is adjusted to Statkraft in particular, as investments in low-carbon resources (meaning first and foremost gas) is considered as offensive, but not innovative, in this study. This is based on the company's starting point – a 100% coal producer going into gas could maybe be characterized as innovative, but as Statkraft's portfolio was 100% renewable at the beginning of the period studied, engaging in gas will be considered as 'merely' offensive. An innovative choice of investments on Statkraft's behalf would be to go deeper into old renewable energy, or investing in *new* renewables.

[6] 'Old' renewables refers to traditional energy technologies such as medium- and large-scale hydropower and geothermal energy, while 'new' renewables refers to non-traditional renewable energy technologies such as wind energy, solar energy, small-scale hydropower and biomass.

expected to be influenced by factors on three levels, working through mechanisms of risks and opportunities.

2.2.1 Multi-level governance

The conceptual perspective of multi-level governance (MLG) has mainly been applied to understand EU policy-making. It looks for explanatory factors at the local, national, EU and sometimes global levels (see e.g. Hooghe and Marks 2001; Fairbass and Jordan 2004), but has also been used to understand the *implementation* of EU policies. Jon Birger Skjærseth and Jørgen Wettestad (2008a, 2008b) use MLG to explain the implementation of the EU ETS in various member states, examining explanations at the national, EU and global levels.

In this thesis, I show that multi-level analysis is useful also for understanding the implementation of policies at the corporate level. In seeking to understand the effects of the EU ETS and the wider climate-change issue in Statkraft, it is necessary to look for explanations at several levels of governance: the EU, national and company levels.[7] It can be argued that the company is a governance level in its own right, since it is (to some extent) up to the company to choose how to respond to the risks and opportunities within its context. The corporate level is also considered to consist of actors with the possibilities to shape long-term strategies (at least partly) independent of exterior framework conditions.

2.2.2 Risks and opportunities

Steger (1993) applies an idea of risks and opportunities when creating his typology of environmental strategies. He concludes that an environmental regulation will shape a company's strategy through two mechanisms: the intensity of *risk* inherent in the company's operations, and the market *opportunities* available to the company. In other words, he focuses on how a regulation creates *external* risks and opportunities for a company (see table 2).

[7] The main reason for excluding the global level in this thesis is an argument put forward in Skjærseth and Wettestad (2010: 117–118), that holds that the international climate regime has gone from being a 'source' to a 'target' of EU climate policy. That means that the EU to an increasing extent is exerting global leadership, thus making the influence from the global level in itself less interesting for the purpose of my study.

Table 2: Steger's typology of environmental strategies

	FEW OPPORTUNITIES	**MANY OPPORTUNITIES**
Small risks	Indifferent	Offensive
Large risks	Defensive	Innovative

(Source: Steger 1993)

Building on this, it is reasonable to expect that, if the EU ETS presents a company with small risks (as when the company portfolio is only minimally fossil-based), the company is likely to be *indifferent* to the regulation – unless it provides some new or extended market opportunities. In that case, the strategy can be more *offensive*, as the company will most likely try to exploit the opportunities following the EU ETS. Companies with large inherent risks (a carbon-intensive portfolio) will adopt a *defensive* strategy if there are no relevant opportunities in adopting a more pro-active climate strategy. An *innovative* company will face large risks, but also many opportunities; and it will seek to tap these opportunities and avoid the risks through major changes in activities.

At the outset, it can be concluded that Statkraft has little environmental risk inherent in its activities in the period studied. Based on Steger's typology, this would mean that the defensive and innovative categories should be reckoned as less likely outcomes for Statkraft. However, Steger's typology is concerned only with external drivers for changes in climate strategy, as a company's risks and opportunities are expected to be shaped mainly by environmental regulations (from the international and/or the national level). By taking the corporate level into account, this thesis opens up for internal explanations for changes in climate strategy. With this perspective, it is considered possible for a company to end up with all four strategies – for instance, a combination of many opportunities and favourable internal conditions could lead a low-risk company to adopt an innovative climate strategy. For a company like Statkraft, then, we will need to investigate the degree of opportunities presented by external factors (based on Steger's model and the EU and national levels) as well as the degree of pro-activity in the internal responses to such changes (the company level).

It is important to note that the external drive for changes in climate strategy is not expected to be the EU ETS alone. The trading scheme influences companies through mechanisms of risks and opportunities together with other external factors, and it is likely that the EU ETS

can serve to reinforce or weaken the strength of other factors at play. It is also possible that factors other than the EU ETS have had a more decisive effect on strategy changes.

Let us now return to the multi-level governance approach, looking at some likely explanatory factors from the three different levels.

2.2.3 The EU level

The most interesting explanatory perspective in this thesis is the EU level, as it includes the influence from the EU ETS. This perspective is based upon the assumption that key sources of corporate strategies can be found within the international institutional context in which companies operate, and that institutions like the EU provides companies with both constraints and opportunities (Skjærseth and Skodvin 2003:31–32). As the EU ETS is one of the most important and far-reaching regulations targeting the power sector introduced at the EU level, it is reasonable to expect that it will have influenced changes in Statkraft's climate strategy. It is assumed that the more opportunities the EU ETS provides Statkraft with, the more likely is it that the company will adopt an innovative climate strategy. To determine the extent and shape of opportunities stemming from the EU ETS, we need to take a closer look at the specific design features of the scheme. Two design features in particular have been identified in the literature: stringency, and predictability (Rogge et al. 2010:3). I would also like to add a third: degree of complementarity with other policy items.

The EU ETS and stringency

The degree of impact of a regulation on a company is held by many writers to be related to the stringency of that regulation (see Porter and van der Linde 1995a, 1995b, Bernauer et al. 2006, Rogge et al. 2010). With the 'Porter hypothesis', Porter and van der Linde (1995a) have challenged the traditional view that stringent environmental regulation almost always leads to higher risks and reduced profitability for companies. They write: 'Properly designed environmental standards can trigger innovations that lower the total cost of a product or improve its value' (1995a:120). Business should start to view environmental improvement as an economic and competitive opportunity. Those companies that can identify the opportunities first and opt for innovation-based solutions will, according to Porter and van der Linde (1995a:130), reap major competitive benefits. With properly designed regulations,

a company will be willing to see and seize opportunities – take risks, and change its business strategy to achieve the desired end. In the words of Bernauer et al. (2006:2): 'Environmental regulation could, they [Porter and van der Linde] claimed, induce innovation by making industry aware of and willing to exploit otherwise missed opportunities'. Since companies can handle lax regulation incrementally, regulation will need to be stringent enough to promote real innovation (Porter and van der Linde 1995a:124). I thus offer the following hypothesis:

H1: The more stringent the EU ETS, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

Stringency in the ETS context is determined mainly by the emissions cap, allocation method and import of credits, as will be explained in chapter 4. Increased stringency is operationalized as a more stringent cap (tighter emissions control), more auctioning of emission allowances, and more restrictive use of credit imports – all resulting in a higher carbon price. Such changes in the scheme will give companies greater impetus to search for new opportunities, and that will make an innovative climate strategy more likely.

The EU ETS and predictability

If a regulatory process is characterized by high uncertainty, it is likely that short-term interests will predominate, and a company will probably be hesitant towards new innovations and behaviour beyond strict compliance (see e.g. Hoffman et al. 2008). R&D is a risky process where the outcome always is uncertain, and it is even more risky if markets and framework conditions are unpredictable. Unstable carbon prices make investments in climate-related technologies less attractive. Based on this, the following hypothesis can be derived:

H2: The more predictable the EU ETS, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

Predictability is measured as Statkraft's confidence in the EU ETS – the company's feeling of long-term certainty with regard to both the scheme's functioning and its environmental effectiveness. Expectations of a stable carbon price increase the predictability of the EU

ETS. Increased predictability can be a result of, for instance, longer trading periods and decisions on long-term continuation of the trading system.

The EU ETS and complementarity

Finally, the EU ETS may complement or conflict with other EU climate-policy instruments or instruments in associated fields. EU policy on promotion of renewable energy is also targeted directly at the power sector, together with several other instruments of the EU's wider climate policy (see chapter 4). Complementary targets and policies could strengthen the EU ETS and hence provide companies with even more opportunities – as long as the policies change a company's incentives in the same directions. Based on this, the third hypothesis in this study is:

H3: The higher complementarity of EU policies affecting the power sector, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

Complementarity can be measured in many different ways, but here it is operationalized as Statkraft's perception of the overall EU climate goals (the '20-20-20'-goals), the directive on promotion of renewable energy, and the trading scheme – whether the company thinks these different pieces of legislation influence it to move in the same direction.

2.2.4 The national level

Norway

The second explanatory perspective in this thesis is concerned with the influence of national factors. Skjærseth and Skodvin (2003) have used this perspective to shed light on how multinational corporations adopt climate strategies, taking as a starting point that companies are influenced by their home-base countries. They write: 'Multinational corporations […] are largely controlled by their home-base countries in which they have their historical roots, headquarters location, and frequently main operation' (2003:17). Skjærseth and Skodvin build on previous research that holds that the 'nationality' of companies is important for their attitudes, culture and strategies (Gleckman 1995, Rowlands 2000). This perspective has been used primarily to explain why companies from different countries have responded differently to the same environmental challenge, but it can also provide a useful perspective when

studying change over time within one company. It is reasonable to believe that the policy targeted at the power sector in Statkraft's home-base country, Norway, is a factor that influences the company's choice of climate strategy. Thus our fourth hypothesis is:

H4: The more supportive Norwegian climate and energy policy targeted at the power sector, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

Norwegian policy will be considered to be supportive to the extent it contributes to making new renewable energy profitable, for instance through an active ownership policy, subsidies or other support schemes. State policy targeted at the power sector will have to be sufficiently ambitious if Statkraft is to adopt an innovative climate strategy.

Other European countries

Although the strongest influence of national factors is expected to come from Norway, Statkraft's home-base country, policy in other countries may have affected the company's climate strategy as well. National renewable support schemes have probably been decisive factors when Statkraft has decided where and in what to invest. Without support schemes of various kinds, wind-power development, for instance, would not be profitable. Support schemes lessen the risk, create opportunities, and have probably been important factors in Statkraft's climate-strategy considerations. This is in accordance with the Porter-hypothesis, which holds that stringent and harmonized regulation is likely to result in a more innovative strategy.

H5: The more ambitious the support schemes in other European countries targeted at the power sector, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

This independent variable in this thesis will be measured like the previous variable – 'ambitious' support schemes are schemes considered by Statkraft to improve the profitability of new renewable energy.

2.2.5 The company level

Common to both the perspectives presented thus far is their emphasis on factors external to Statkraft for explaining opportunity generation and changes in climate strategy, as in line

with the typology presented by Steger (1993). However, I expect that also factors internal to Statkraft can have influenced changes in climate strategy. The third explanatory perspective in this thesis opens up the company 'black box' and takes a look at what goes on inside Statkraft, as the way in which opportunities are met or utilized can be shaped by company-internal factors.

The literature suggests many company-specific factors that may have an impact on choice of corporate strategies. I have chosen to focus on one main factor: the role of company essence and identity. According to Halperin et al. (1974:28) an organization's 'essence' is the view held by the dominant group in the organization as to what its missions and capabilities should be. In some organizations, all employees may share the same view of the essence; in other cases there may be differences and conflicts related to how this essence is defined (Halperin et al. 1974:28). This theory is useful to clarify whether there exists a prevailing notion of what a company is and should be. A company's identity will be based largely on that 'essence', and a company that identifies with innovative and new solutions is more likely to react pro-actively to a climate-change regulation than a company without such an identity. This is in accordance with theories of path-dependence that hold that the decisions a company makes now will be limited by decisions made in the past (see e.g. Pierson 2000). This means that 'history matters' – Statkraft's 'old' identity and essence will affect changes in the company in the 2000s, and hence also how it reacts to the opportunities presented by the EU ETS and climate policy in general. It is likely that Statkraft will favour policies that strengthen its company essence, and reject policies that may threaten this essence. This leads to our final hypothesis:

H6: The more Statkraft can be characterized as a company with an innovative identity prior to and during the period studied here, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction.

The explicit focus on an *innovative* identity is a natural consequence of the continuum chosen to map the dependent variable – an innovative strategy is considered as the most pro-active climate-strategy, so we need concepts to explain the choice of such a strategy. The concept of 'innovative identity' will be operationalized through narratives of corporate specific attitudes towards Statkraft's identity. In particular, I will look for different opinions in the company related to Statkraft's role as an innovator. 'Innovation' can be defined in

various ways: here it is defined as consisting of research and development of low- and zero-carbon power generation technologies that are *new to the company* (building on Rogge and Hoffmann 2010) [my emphasis].

2.3 Summing up

This chapter has presented and discussed the theoretical framework employed in this thesis. The dependent variable – 'changes in climate strategy' – will be measured on a continuum from 'defensive' to 'indifferent', 'offensive' and 'innovative'. The higher up on the scale, the higher is the commitment towards climate change, and the more pro-active is the strategy chosen by the company. Statkraft's placement on the continuum will be established through an empirical analysis of climate-related changes in overall corporate vision and strategy, organization, investments, and innovation and R&D.

The explanatory perspectives in this thesis are derived from the multi-level governance approach, seeing company strategy as the result of factors from the EU, national and company levels. These three levels influence the climate strategy through their effects on risks and opportunities.

3. Methodological considerations

This thesis describes whether and how Statkraft's climate strategy changed in the period 2003–2009, and seeks to explain why these changes occurred. I have already presented how the different variables in this thesis will be measured. The remaining methodological considerations relate to my overall research strategy, and the various sources of data employed.

3.1 Case study and process-tracing

This study is designed as an explanatory single-case study – of the effects of the EU ETS on one company, Statkraft. The case-study approach offers the possibility of getting in-depth knowledge of a single phenomenon in a complex setting. Case studies are the preferred strategy for investigating questions of 'how' and 'why' (Yin 2003:1), and they enable 'thick' descriptions of a case (Gerring 2007:49).

The most common criticism of the case-study method is that it suffers problems of representativeness and low scientific generalization value beyond a particular setting (see e.g. Gerring 2007:43). This is referred to as 'low external validity', since external validity concerns the domain to which findings can be generalized. On the other hand, case-study findings can be generalized to theory: this is known as 'analytical generalization' (see e.g. Yin 2003; Gibbert et al. 2008). The empirical data in this thesis are systemized and organized by the theory presented in the previous chapter. I take as my starting point the typology developed by Ulrich Steger (1993), who explains corporate climate strategies by looking at externally given risks and opportunities. By adding factors from the internal, company level, I hope to use the findings of this thesis to revise the original theory framework. The theory value of this thesis thus lies in the use of theory-founded hypotheses to study changes in Statkraft's climate strategy – making this a theory-interpreting case study.

The case-study methodology used consists of a combination of control for rival explanations and the process-tracing technique. These techniques are employed to increase the internal validity of the study, i.e. the establishment of causal relationships. Process-tracing 'is one

means of attempting to get closer to the mechanisms or microfoundations behind observed phenomena' (George and Bennett 2005:147). The term 'mechanism' can be used variously (for a good overview, see Hovi 2004): here it refers to the 'intermediate' process between, e.g., climate change regulations (the cause) on the one hand, and climate strategy (the effect) on the other (this approach is inspired by Stokke and Vidas 1996). To detect these mechanisms, this study relies partly on the technique of process-tracing:

> The process-tracing method attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable (or variables) and the outcome of the dependent variable (George and Bennett 2005:206)

Process-tracing is particularly useful in a situation of causal complexity – when multiple causes interact to produce effects (Ragin 1987:23–30). One sort of causal complexity is path-dependence, 'the causal relevance of preceding stages in temporal sequence' (Pierson 2000:252). It is reasonable to assume that Statkraft is affected by what has happened at earlier points in time, perhaps especially as regards company history and company identity (see hypothesis 6). Process-tracing is a useful technique for detecting how outcomes have been restricted by choices made at decision-points along the way (George and Bennett 2005:213).

3.2 Sources of data

A major advantage of the case-study method is that it allows the use of a range of sources to investigate a single case (Yin 2003:97). The data used for this thesis are both quantitative and qualitative, and collection has been based on multiple sources available to the author. *Reliability* concerns the extent to which a study can be replicated, which in turn is related to the methods used in collecting and analysing the data (LeCompte and Goetz 1982:35). Most data used in this thesis have been collected from readily accessible open sources, like company annual reports, newspaper articles and press releases. The interview transcripts cannot be accessed for new studies, but I present a list of informants in Appendix 1. I will describe how the interviews were carried out below. Triangulation of multiple sources has been employed consistently throughout the analysis, and an interview is never used as the sole source of information for a significant argument.

3.2.1 Document information

I have conducted both quantitative and qualitative document analyses in this thesis. The quantitative document analysis has been a word count, as part of mapping changes in Statkraft's overall corporate vision and strategy. The challenges related to this will be elaborated on in section 5.1.1. My findings are based mainly on qualitative document analysis. To map the dependent variable – changes in Statkraft's climate strategy – I have relied especially on sources from the company itself: Annual Reports from 1999 to 2009, the in-house magazines *Fossekallen* (1999–2008) and *People and Power* (2009–2010), and press releases issued in the period studied. I have also used various newspaper articles and secondary historical company studies to identify changes in climate strategy. The works of Lars Thue and Dag Ove Skjold (Thue 2006, Skjold 2006, Nilsen and Thue 2006, Skjold 2009) have been of particular importance and value to this study. Regarding the explanatory perspectives, my interviews and various official documents (e.g. from the EU and the Norwegian authorities) have been the principal sources, in addition to the above-mentioned annual reports, in-house magazines and historical accounts.

When using a written source it is important to keep in mind what sort of source it is – who is speaking to whom, for what purpose and under what circumstances (George and Bennett 2005:100). For instance, an annual report is a company's major source of self-representation. There may be a gap between how a company wants to present itself, and how it actually performs. I have tried to remain critical and aware of the potential discrepancy between rhetoric and actual company actions.

3.2.2 Interviews

To complement the written material, I have conducted 13 semi-structured interviews between August and December 2010.[8] One goal of interviewing is to contribute to data triangulation by confirming and adding to information already collected from other sources (Tansey 2007:766). The interviews have been especially important in the analysis of the third explanatory perspective with regard to understanding company identity and culture.

[8] Nine interviews were with current or former Statkraft employees, and four were with people with extensive knowledge of the company and/or the power sector.

Informants in this study were chosen strategically – I wanted to talk to those individuals who had the most knowledge and experience of changes in Statkraft's climate strategy in the period 2003–2009. I began by contacting and interviewing people outside Statkraft but with knowledge of it, and this proved extremely helpful in gaining understanding and alternative perspectives in the early phase of my project. I then started to use the form of non-probability sampling known as the *snowball method*. According to Tansey (2007:770), this method is particularly suitable when the population of interest is not fully visible. That was the case in my study – it is hard to get an overview of current and former employees in Statkraft, and it is hard to tell who has been in charge of what. I therefore started out with some respondents already known to me from media coverage or from the early interviews with informants outside the company, and then contacted the persons they suggested. I continued in this way until I felt that the sample was large enough for the purposes of the study.

There were some limitations to my selection method. For one thing, some potential interviewees were no longer working for Statkraft. I still tried to contact them, but as many of them were now busy in new jobs – or had retired – it was hard to get interviews. However, many of my informants had indeed worked in Statkraft throughout the entire period under investigation, and these interviews were highly valuable. I was also able to get interviews with two former Statkraft employees. Secondly, it was difficult to be sure that all 'camps' or factions within the company had been covered in my interviews. One main disadvantage of the snowball method is the risk of recruiting only informants from the same circles – people who might be friends, or at least share the same ideas, traits and intentions. To help mitigate this, I also included some informants not found via the snowball method – people from Statkraft I came across in interviews or the in-house magazines, and whom I perceived as relevant sources of information.

Before carrying out the interviews, I prepared an interview guide. This was then adjusted to each informant, as the interviewees had knowledge of various different aspects of Statkraft's climate strategy. In general, the interview guide contained questions regarding developments in the company, especially as regards innovation, and questions focusing on how these developments could be explained. The interviews were conducted face-to-face on the company premises, with the exception of the two informants who were no longer working for Statkraft. I did not record the interviews, but took detailed notes. This was because I wanted the informants to speak as freely as possible – I was afraid that that a tape recorder

might lead them to withhold information or opinions that could have been important. I transcribed my notes shortly after each meeting, while the interview was still fresh in my mind. I also agreed to conceal the identity of my respondents. It would of course have been a strength to be able to quote different informants directly in this thesis, but as corporate strategy is a sensitive issue, I assumed that it would be harder for informants to speak openly if they knew they might be confronted with their statements later. For an overview of my informants, see Appendix 1.

The interviews conducted in this study were semi-structured – carried out on the basis of an interview guide, but where I could pose follow-up questions. The informants also had the possibility of contributing additional data and input I had not considered at the outset. In general, the interviews were more like a conversation than a strict interview. This was important in order to get a relaxed atmosphere, open up for nuances, and detect mechanisms and variables I had not thought of before the interview.

There is a growing body of literature that examines the specific methodological challenges associated with interviewing *corporate elites* (see for instance Welch et al. 2002; Tansey 2007)[9]. According to Tansey (2007:767), one of the strongest advantages of elite interviews is that researchers can interview first-hand participants of the processes they are studying. However, it is hard to be sure of much that I was told – how reliable was the information the informants gave me?

Two main challenges of semi-structured interviews are the (power and) credibility of informants, and interviewer effects. The first point refers to the role of the informants, who '[…] tend to be visible individuals both within and outside their organizations and affect the interview situation and the quality of data in many ways' (Welch et al. 2002:612). Company strategy is a sensitive issue, and corporate elites are often cautious or strategic about the information they provide. There is also the chance that interviewees may adapt the conversation to their own agenda. Statkraft employees are probably interested in protecting

[9] Welch et al. (2002) do not assume that corporate elites are confined to the senior management of firms, as they define an corporate elite interviewee as: '[…] an informant (usually male) who occupies a senior or middle management position; has functional responsibility in an area which enjoys high status in accordance with corporate values; has considerable industry experience and frequently also long tenure with the company; possesses a broad network of personal relationships; and has considerable international exposure'. This definition applies to all my nine Statkraft interviewees.

the image of their company, and, due to fear of competitors, they will not wish reveal too much about company strategy or company thinking on important strategic issues. As noted by Welch et al. (2002:615), 'Elite subjects may easily dominate the interview because they are "professional communicators" used to addressing a wide range of audiences and developing elaborate and persuasive arguments'. Indeed, some of my informants tried to dominate the interview and challenge my statements and questions, for instance by declaring my questions 'irrelevant'. I sought to prevent this from becoming a problem by maintaining an active role in the interview situation, and staying on my guard.

As to the second point, *interviewer effects* are errors that arise as a result of the behaviour of the interviewer, more specifically due to statements or opinions stated on the part of the interviewer that are evident during the interview and may affect the outcome. Such bias can also occur due to badly worded questions, question order or misunderstandings on behalf of either party. A reasonable way of dealing with these pitfalls is to rely on other sources of evidence in addition to the interviews, to corroborate insights from informants and search for contrary evidence (Yin 2003:90). That is one of the main reasons for my extensive use of data triangulation in this study.

4. Background

This chapter offers some background information necessary for the empirical analysis in this thesis. It gives an account of the EU's Emissions Trading Scheme in the wider context of EU energy and climate policy, and an introduction to the history and identity of Statkraft. Let us begin with the underlying rationale of emissions trading.

4.1 Emissions trading: underlying rationale

Much of the platform for emissions trading can be found within the traditions of environmental economics and ecological modernization. From an economics perspective, trade in emission rights is an efficient instrument for achieving environmental goals. In the case of climate change, the market fails to recognize the scarcity value of the atmosphere as a sink for GHG emissions, as there is no *price* that signals this scarcity (Ellerman et al. 2010:2). An emissions trading scheme is intended to internalize this scarcity, thereby repairing the market failure. Crocker (1966) and Dales (1968) are classic works in the environmental economics literature. They argue for transferrable pollution rights, through setting of a cap, the allocation of allowances under this cap, and free trade in allowances to let the prices emerge. This would lead to abatement being allocated automatically to those market participants who could abate at least cost (ensuring that the cheapest reductions are made first), and the price signal would create a continuing incentive to innovate. This is basically the idea of a cap-and-trade system, and the logic underlying today's EU ETS.

The EU ETS is also firmly placed within the discourse of ecological modernization which has come to dominate the debate on environmental regulations since the early 1980s – appealing to governments and decision-makers the world over (see e.g. Hajer 1995). Ecological modernization as policy discourse recognizes the ecological crisis, but holds that environmental problems can be solved within the existing main institutional arrangements of society, and that economic and environmental imperatives can be reconciled (Hajer 1995:3, Gunningham 2009:217). A central idea here is that pollution prevention pays – there is money to be made in environmental protection (Hajer 1995:3, Dryzek 2005:167). Technology and innovation are seen as essential for the well-being of the environment and

business alike – technology to reduce waste and pollution will lead to more efficient production, contented workers and the possibility for business to sell new, 'green' products (Dryzek 2005). The EU ETS is based on the assumption that industry holds the key to ecological modernization – in a carbon-constrained world, industry itself will find the best means to reduce emissions.

4.2 EU's climate policy

This thesis aims to describe and understand changes in Statkraft's climate strategy in the period 2003 to 2009 – with the EU in general, and the EU ETS in particular, assumed to have shaped this development. Thus we need to account for the content and functioning of the EU's climate policy, focusing on the changes and important milestones that have affected the power sector over the past decade.

Over the last 20 years, the European Union has slowly and incrementally developed a common climate change policy (Jordan et al. 2010:9). The first half of the 1990s is often seen as an *agenda-setting* phase, where climate change was put firmly both on the international and European policy agendas (Jordan et al. 2010:9, Oberthür and Pallemaerts 2010:27). In 1990, the European Community concluded that it would be prepared to take measures to stabilize CO_2 emissions at their 1990 levels by the year 2000 (ibid.:29). Reaching agreement on common measures to implement this target proved difficult, and national emissions-reduction programmes were effectively left to the member states. An international agreement on climate change (UNFCCC) was adopted in Rio de Janeiro in June 1992, but also this lacked specific measures or quantified objectives (UN 1992).

In the negotiations leading up to the Kyoto Protocol in 1997, the EU advocated binding international commitments for industrialized countries ('Annex 1 countries') to reduce their GHG emissions. The EU itself ended up accepting the highest reduction target among the

major industrialized countries – 8% (UN 1998). The Protocol also created various market-based mechanisms for implementing these targets.[10]

The Kyoto Protocol entered its implementation stage in the 2000s, entailing substantial new legislation at the EU level (Oberthür & Pallemaerts 2010:28). In 2000, the Commission issued a Green Paper on emissions trading, where it expressed its desire to set up a EU-wide trading system (Commission 2000). The first significant measure to reduce GHG emissions from the power sector was adopted in 2001: a non-binding directive on promoting electricity produced from renewable energy sources (EU 2001). The centrepiece of the EU's new climate policy was the EU Emissions Trading Directive (EU 2003), complemented in 2004 with a directive linking the ETS to the Kyoto Protocol mechanisms (CDM and JI) (EU 2004). These three directives will be discussed in the next sections. Suffice it here to say that, from being perceived as a threat to the wider European integration process in the 1980s and 1990s, a common climate policy had begun to emerge as a new and important driver of this process by the mid- 2000s (Jordan et al. 2010:10–11).

The Commission published an integrated package of energy and climate change policies in 2008. This package was targeted primarily at implementing the European Council's decisions of March 2007 –that the EU's GHG emissions should be reduced by at least 20%, that the share of renewable energy should increase to 20%, and that energy consumption should be reduced by 20%, all by the year 2020 (Council 2007). The '20–20–20'package from 2008 consists of several different pieces of legislation, the most important being a revision of the 2003 Emissions Trading Directive, a new Renewable Energy Directive and a Directive on carbon capture and storage (Oberthür & Pallemaerts 2010). The package, which is aimed primarily at the post-2012 period, amounts to a major overhaul of EU climate policy. As Jordan et al. (2010:12) conclude: '[…] the EU is now rightly perceived as a hugely important actor in climate policy making internationally, but especially in Europe'.

[10] Including international emissions trading, the clean development mechanism (CDM) and joint implementation (JI). CDM allows Annex 1 countries to gain emissions credits from emission-reduction projects financed in developing countries, while JI gives credits for projects financed in 'economies in transition' (UN 1998).

4.2.1 The EU's Emissions Trading Scheme

The EU ETS, adopted in 2003, was the world's first international company-level 'cap-and-trade' system of allowances for emitting CO_2. As explained in section 4.1, the intention is to create a market and a price for carbon, in order to be able to achieve GHG reductions where least costly. A cap on the total amount of emissions is set in accordance with the EU's environmental ambitions, and this amount is divided into emission allowances (European Union Allowances, EUAs). One EUA gives the right to emit one tonne of CO_2. These allowances are distributed to installations covered by the scheme; and, if the system is to make any sense as an instrument for reducing emissions, fewer allowances should be allocated than are projected to be needed. The allowances can be distributed free of charge or through auctioning, and the companies covered by the scheme can then trade allowances with each other. If company A keeps its emissions below the level of its allowances, the company can sell its excess 'rights to pollute'. Company B, on the other hand, facing difficulties in remaining within its allowance limit, can buy allowances from company A – or (preferably) take measures to reduce its emissions. Company B may also choose to comply by purchasing CDM or JI credits on the market. These are known as certified emission reductions (CERs), as they have to be certified by the UNFCCC Clean Development Mechanism Executive Board. There are no restrictions on who may purchase allowances, or on how or where the exchange of allowances may take place. Every year the individual installations covered are obliged to return to the government an amount of emission allowances equivalent to their CO_2 emissions that year. Penalties for non-compliance are included in the scheme.

Phase I and phase II

In the following two sections I focus on changes in the EU ETS in the period 2003–2009, to highlight how the scheme has developed so far, since a central assumption in this thesis is that changes in the scheme can have influenced changes in Statkraft's climate strategy. The EU ETS has been implemented in phases. The aim of the first or 'trial' phase (1 January 2005 to 31 December 2007) was to gain experience. The second phase – the 'Kyoto phase' – began in 2008 and will run through 2012. As of 2005, the EU ETS covered CO_2 emissions from large emitters in the power- and heat-generation industry and in selected energy-intensive industries in five sectors: electricity (and heat) production, iron and steel, oil and

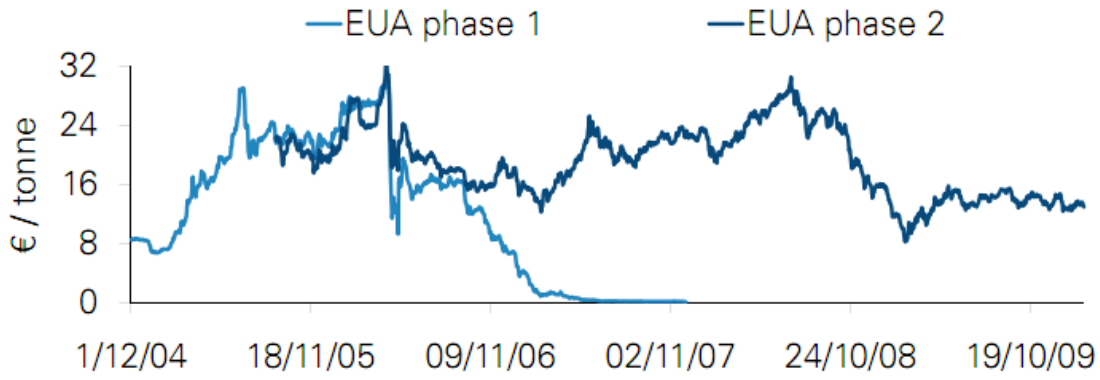
gas, building materials, and pulp and paper. Reductions achieved by the use of 'sinks'– like planting trees – were not allowed. In the current system (2008–2012), EU member states are allowed to have additional activities, installations and greenhouse gases covered by the ETS, as long as they obtain approval from the Commission (Pohlmann 2009:345). The scope remains rather narrow, as the scheme excludes emissions from road transport, aviation, shipping, agriculture and forestry. Some 11,000 installations are covered by the scheme in phase II, accounting for about 45% of the EU-wide total of CO_2 emissions (Pohlmann 2009:345).

The EU ETS was initially established as a decentralized system, where crucial policy aspects were generally the responsibility of the member states (Skjærseth & Wettestad 2009:111). In the first two phases, allowances have been distributed by the member states via their National Allocation Plans (NAPs). The Commission has a watchdog role through its authority to assess the NAPs and reject them if they do not comply with the guidelines in the Directive. NAPs fix the total cap of allowances in each member state, and allocate targets (allowances) to all the individual installations covered. The overall EU cap is the aggregate of the national caps. Each member state can, to some extent, determine the method of allocation – up to 5% could be auctioned in phase I, and up to 10% in phase II. However, most countries have chosen to distribute the allowances by means of free allocation based on historic emissions ('grandfathering'). Only three countries reported that they had auctioned allowances in phase I (Pohlmann 2009:365). Free allocation of emissions was crucial for getting the EU ETS adopted: '[…] there would have been no EU ETS unless allowances in the trial period had been allocated for free' (Ellerman et al. 2010:288).

The NAP process prior to phase I was characterized by many delayed and incomplete plans (Wettestad 2009:315). The ambitiousness of the first allocation process was rather modest, as the 'CO_2 emissions were about 80 million tonnes, or 4 %, lower than actual emissions' (Skjærseth & Wettestad 2009:114). The carbon price fluctuated significantly between 2005 and 2008, with a particularly steep price drop in 2007.Much of the blame for this low level of ambition is put on the decentralized nature of the system. Skjærseth and Wettestad write: '[…] the decentralized nature of the scheme facilitated a "race to the bottom" where each member state had incentives to allocate generously to protect its own industries' (2009:115). Precisely because the system is decentralized, member states seize the opportunity to allocate too many allowances, to protect their own industries and interests.

Already early in the allocation process in 2006–2007 (making NAPs for phase II) EU environment commissioner Stavros Dimas stated that 'much to my regret, taking the first 17 notified national allocation plans, they propose a cap about 15% above actual emissions in 2005'(cited in Skjærseth & Wettestad 2009:114–115). The first analyses of the NAPs in phase II, however, showed that the member states were not as 'generous' as in phase I – probably since they now had to show more clearly that their total allocation for the period 2008–2012 was in line with their Kyoto targets under the EU's BSA. The Commission also took on a more active role in phase II, and this eventually led to reduced emission ceilings (Asselt 2010:130). Thus, the scheme became somewhat more stringent from phase I to phase II. The figure (2) below shows the development in the carbon price so far.

Figure 2: Prices in the EU ETS, 2004-present[11]



(Source: Point Carbon 2010)

The revision of the scheme

The following passages are important for understanding the kind of EU ETS that Statkraft and other businesses can expect in the future. Many decisions related to climate strategy are long-term (especially in relation to investments and innovation), so it is imperative to understand the probable contours of the future EU ETS. In January 2008, the Commission put forward a proposal for a far-reaching revision of the ETS for the period 2013–2020 and

[11] Front year contracts for phase 1 and phase 2.

beyond (Commission 2008), centred on the overall goal of 20% emissions reduction by 2020 compared to the 1990 level.

The revised EU ETS (EU 2009a) will be extended to include other sectors and greenhouse gases (not just CO_2 as in the preceding phases), and the next trading period will be longer (7 years) than the current (Commission 2008). The most fundamental change is the EU-wide cap on emissions, intended to make the scheme more coherent end hence more environmentally efficient. NAPs will no longer be needed, and the total number of allowances will decrease linearly from 2013 onwards, by a factor of 1.74% per year (Commission 2008:5). These changes are expected to increase the scarcity of allowances, and hence the price on allowances (Skjærseth & Wettestad 2010:107). It is the 'price on carbon' that is the decisive factor for companies – it determines whether it is more profitable to reduce emissions (e.g., through investment in new technologies), or to continue to pollute and buy allowances or CDM/JI credits instead.

In addition to having a more centralized cap-setting, the EU ETS post-2012 will be a more streamlined market system, more in line with economic textbook ideals (Wettestad & Boasson 2010:9) The distribution of allowances will increasingly be based on market criteria, as more allowances will be allocated through auctioning. From 2013 at least half of the allowances will be auctioned (Commission 2008). As a general principle, the power sector will need to buy all its allowances from 2013, due to this sector's ability to pass the costs on to the consumers (Pohlmann 2009:357). The current free allocation creates the opportunity for 'windfall profits'– the power sector (in particular) makes profits by passing on the market value of the allowances to the consumers, even if the allowances were provided for free (ibid.).

Regarding the links to the Kyoto Protocol's flexibility mechanisms, companies will also post-2012 be entitled to meet part of their target by financing emission reduction projects in countries outside the EU. A cap has nevertheless been introduced on the use of imported credits: it is limited to 50% of the EU-wide reductions over the period 2008–2020 (Commission 2008:9). However, in practice this means that the companies will have about the same access to CDM and JI credits as in the current period (Skjærseth & Wettestad 2010:107). In the event of an ambitious international climate agreement, additional access to

credits should be allowed. However, new quality controls will be introduced 'to assure the environmental and economic integrity of future project types' (Commission 2008:10).

The EU ETS and Norway

Norway's Kyoto target is for GHG emissions to be no more than 1 per cent higher in the period 2008- 2012 than in 1990 (UN 1998). The government has however declared that Norway voluntary will exceed this target by ten percent (*Agreement on Norway's climate policy* 2008). Norway created its own cap-and-trade system in 2005. This scheme covered less than 10% of national emissions, and, as the supply exceeded the demand of allowances, the prices dropped to zero (MD 2008). In 2008, the Norwegian trading scheme was linked with the EU ETS (ibid., Klif 2010). Between 110 and 120 installations are covered, representing 40% of total emissions. From 2013 about 50% of Norwegian emissions will be covered by the ETS.

4.2.2 The EU policy on renewables

Next to the EU ETS, the EU's directives on renewable energy are the major instruments in the Union's climate change policy. As renewable energy displaces energy based on fossil fuels, a greater proportion of renewables will contribute to the reduction of GHG emissions. The share of renewable energy in the EU-27 only rose from 7.2% in 1997 to 7.55% in 2000 (Howes 2010:118). In 2001 Directive 2001/77/EC was adopted, establishing a target of 21% for the share of electricity from renewable sources for each member state by 2010 (EU 2001). The targets under the Directive were only indicative, and progress in developing renewable energy was rather slow in the ensuing years (Howes 2010:122). The Directive was a start, but its results were limited: 'By the mid-2000s it had become evident that the 2001 target would not be met' (Wettestad & Boasson 2010:7).

Having acknowledged these inadequacies, the Commission presented a renewables 'Roadmap' in 2007 (Commission 2007). That same year, the EU decided on a legally binding target of 20% renewable energy for the EU by 2020 (Council 2007). The Renewable Energy Directive, which entered into force on 25 January 2009 (EU 2009b), gives all member states a share of the 20% target, calculated on the basis of their GDP and current levels of renewables. Unlike the revised ETS directive, where national plans are removed,

such plans are introduced in the revised RES Directive. The Directive establishes several cooperation mechanisms, including statistical transfers and joint projects between both member states and member states and third countries (like Norway) (EU 2009b: Articles 6, 7 and 8).

The Renewables Directive in Norway

As the Directive on Renewable Energy falls within the EEA agreement, it includes Norway as well. The situation of Norway is very different from that of the rest of Europe – as renewable electricity production in Norway constitutes around 25 % of the total EU-27 renewable electricity production (Riis-Johanssen 2010). In 2005, Norway had a renewables share of 58% of total electricity production, as compared with 8.5% for the EU (ibid.). As of autumn 2010, Norway was still in the process of writing a draft on a common EEA position on the Renewables Directive, to be followed by a national action plan (ibid.). As Norway has the greatest resources for renewable electricity generation in Europe, the country's policy is central with regard to the flexibility mechanisms in the Directive. The target will also be important for Norwegian businesses and policy-makers, as it will determine how much effort will have to be put into promoting and developing new renewable energy in the coming years.

4.3 Statkraft

We now turn to Statkraft, its history, special characteristics and company identity. To understand the changes in Statkraft's climate strategy in the 2000s, it is important to recognize that this is a rather unique company with a special history and a distinctive position in Norwegian and European power supply.

4.3.1 Early history of state involvement in electricity supply

Norway is blessed with an abundant hydropower potential, due to its mountainous terrain and the presence of flowing water and innumerable waterfalls. The early process of electrification could be based on *waterpower* in Norway – not steam, as in many other European countries. The Norwegian state bought its first waterfall, Paulenfossen, in 1895.

This purchase marked the beginning of a long history of state involvement in hydropower and national electricity supply.

In 1906, the Storting adopted the first of a series of concession laws, requiring private and foreign companies to apply to the state for licences to purchase waterfalls – making it clear that public investments were preferred and that private capital should play a minor part in electricity supply in Norway (Thue 2006:84). The state itself started purchasing waterfalls, and already by 1920 it had become the largest owner of waterfalls in northern Europe (Skjold 2009:60). This state involvement was due to many factors – to ensure that waterfalls remained in Norwegian ownership, to enable electrification of the railway system, to secure power supplies to the general public, to provide state revenues, to counteract monopolization, and to ensure a stable framework conditions and cheap energy for industry (Skjold 2009:61, Thue 2006:91–96).

In 1921, the Norwegian Water Resources and Electricity Board (NVE) was established as the central institution in the state administration of the power sector, signalling a more active role for the state in national hydropower development (Skjold 2009:68). The new directorate was given responsibility for constructing and operating the state-owned power plants, and for all the general administrative issues related to watercourses and electricity.

After a period of surplus electricity and standstill in public investments in the interwar years, the state engaged more heavily in power production in the postwar years. This policy aimed at promoting heavy industry by providing it with cheap and sufficient state power (Thue 2006:392). Economic growth was the overriding objective of Norway's Social Democratic Labour Party governments, and state ownership of hydropower resources was seen as an effective way of ensuring state control over the postwar economy. The period from 1945 to the mid-1960s has been called the heyday of state involvement in power production (Skjold 2006:11). State power production increased from a 10% share to a one-third share, backed up by massive political support for state involvement in the sector (Skjold 2006:11).

The massive workload on the original directorate led, in 1960, to the creation of *Statskraftverkene* (the Directorate for State-Owned Power Plants) as a separate department within the NVE. Statkraftverkene were given the responsibility for the construction, operation and sales of hydropower and the construction and operation of the transmission system, and are hence the historical predecessor of today's Statkraft.

A growing environmental awareness led to changes in Statkraftsverkene's framework conditions in the late 1960s and 1970s. It became harder to obtain permits for new hydropower projects, with ideas of limits to growth and nature conservation coming increasingly to the fore (Skjold 2009:120). Several waterfalls received protected status, and the demand for documentation and environmental impact assessments in concession processes rose. Statskraftverkene responded by looking into thermal power-generation options. The department had almost no experience with power production from nuclear, coal, oil or gas sources, but, due to the uncertainty of hydropower production, Statskraftverkene established its own unit for thermal energy in 1973 (Skjold 2009:125–126).

Nuclear energy seemed to be the future, and Statskraftverkene started developing plans for Norway's first nuclear power plant (Skjold 2009:126). However, opinion abroad and in Norway shifted, and in 1975 the Storting did a U-turn on nuclear power (Skjold 2009:128). In any case, this marked the beginning of Statkraftverkene's investigations and search for additional energy sources – although we should bear in mind that the development of hydropower continued, including the Ulla-Førre project, the largest station ever constructed by the state (Skjold 2009:130).

The 1970s also saw the national set-up of the power pool 'Samkjøringen i Norge' (1971). This was intended as a coordinating body and a marketplace for buying and selling power between internal producers. It provided valuable experience for Nord Pool in the late 1990s, as discussed later in this chapter.

4.3.2 The founding of Statkraft

In 1986, Statskraftverkene became independent from NVE, and was made an autonomous state-owned enterprise *(forvaltningsbedrift)* under the ownership of the Ministry of Petroleum and Energy. It was also given a new name: *Statkraft*. According to Skjold (2009:140), '[…] the chief reason [for the new independence] was that it [the Storting] would free the enterprise from political and civil service interference and that this was essential if the organization were to be efficiently and profitably run'. It was considered undesirable to limit Statkraftverkene's financial freedom, and to have the enterprise operate from within the state department in charge of regulating the very same sector. To avoid this mix of roles and to make efficient management easier, Statkraft became a partly independent

organization. However, it was not given political independence, as it was still intended to be a public policy instrument in the power sector (Skjold 2009:146). Statkraft moved from the administrative role of a state department to that of a state business, and it still had to undertake tasks outside a purely commercial framework – like supplying large industries with power through politically fixed long-term contracts, and managing the national grid (Skjold 2009:146–147). Statkraft was still dependent on funding over the state budget. In the years after 1986, Statkraft was thus expected to do both administration and business; it underwent a considerable transformation of its identity and corporate culture as well as in its orientation towards its surroundings (Nilsen and Thue 2006:18).

The early 1990s marked the beginning of a new era in Norwegian electricity supply. A comprehensive electricity reform was adopted in 1991. Before this reform, the Norwegian power market had been characterized by politically set prices, a decentralized structure of local and regional monopolies, and long-term contracts with industry (Grønlie and Flo 2009:138). Only 10% of all Norwegian power production was sold through 'Samkjøringen', and the power system was criticized for inefficiency. The Storting decided to liberalize the energy sector, and a new Energy Act became law on 1 January 1991 (Nilsen and Thue 2006:284). The changes were profound: '[…] suddenly, Norway was a world leader of the liberalization of trade in electricity' (Skjold 2009:157). Later in 1991, the new Brundtland government (Labour) presented Proposition No. 100 to the Storting, according to which 'Statkraft shall be operated as a commercial enterprise, but will have responsibility for statutory-priced contracts' (as cited in Statkraft Annual Report 2004:7). The Brundtland government created a new structure for state-owned companies: the *Statsforetak*: State Enterprise. This resembled an ordinary limited company *(aksjeselskap)* as the company's finances were no longer tied to the Storting and the state budget – but it was still 100% state-owned. The State Enterprise was still politically controlled, but had greater freedom to act (Skjold 2009:189, Nilsen and Thue 2006:293).

In a market-based system, it was unacceptable for one of the traders to own the transmission grid. That would give the trader a too dominant role and weaken competition: so the owner of the national grid would have to be a neutral operator (Skjold 2009:158). Statkraft was divided into two state-owned enterprises: Statkraft SF for power generation, and Statnett SF for the national transmission grid. Statnett was also, through Statnett Marked (established in 1993), in charge of the new marketplace.

Since the mid-90s, Statkraft has been expanding, at home and abroad. It has bought up enterprises and shareholdings, mostly in Norway but also in Sweden as well as elsewhere in and outside Europe. Its national expansion started in 1993 when Statkraft bought Finnmark Energiverk. Two of the later and largest purchases in Norway were those of Skagerak Energi and Trondheim Energiverk. The national Competition Board put a stop to Statkraft's expansion at home in 2002, and it became clear that any new purchases would lead to new confrontations with the Board (Skjold 2009:214).

In the 1990s, the company started to aim for the north European market, rapidly becoming an active participant on the new power market. In 1996 the Nordic power exchange, Nord Pool, was established – in fact, the world's first international power exchange. With effect from 1 October 2004, Statkraft's business was transferred from the state-owned company Statkraft to the limited company *Statkraft AS* – still 100% state-owned.

4.3.3 Today's Statkraft

Statkraft in the 2000s is further discussed in the following chapters, so here I offer only a brief introduction to the company's recent identity. First of all, Statkraft has followed a strategy of international expansion in this period. It has invested in gas-fired stations in Germany, in wind farms in Sweden and the UK, and in hydropower in southeast Europe. It opened offices in London and Sofia in 2006, in Belgrade, Bucharest and Tirana in 2007. The company has also become involved in hydropower projects outside Europe , through the company SN Power AS, set up in 2002 in collaboration with Norfund. It has made investments in, among others, Sri Lanka, Peru and Chile (Skjold 2009:241). 'Statkraft has expanded from being a large Norwegian enterprise into a quite significant player on the global stage' (Skjold 2009:204). This development was further strengthened on 24 July 2008, when Statkraft and E.ON signed a final agreement for a swap deal worth NOK 44 billion. Statkraft took over a total of 63 power and district heating plants in Sweden, Germany and the UK, and increased its total generation capacity by approximately 2,500 MW (Statkraft 2008). According to Skjold (2009:228), this E.ON agreement was 'the outcome of a targeted, aggressive strategy of international expansion'.

Concerning energy sources, Statkraft's energy production has remained mostly hydropower-based throughout the 2000s. Power generated from burning fossil fuels accounts for most

energy produced in countries like Germany, the UK, Italy and Spain, but Statkraft and Norway rely heavily on hydropower. Statkraft has become an increasingly diversified company in the 2000s as regards both geography and technology. At year-end, the Statkraft Group had 1970 (2003), 2087 (2006) and 3378 (2009) employees (full-time equivalents). I return to these developments in chapters 5 and 8; here the point is to show that Statkraft's identity changed drastically in the 1990s and 2000s

4.3.4 Understanding the market

Now for some words on the Nordic and the European power market – to understand the market conditions under which Statkraft operates. All the Nordic countries have liberalized their electricity markets, opening both electricity trading and electricity production to competition. The Nordic electricity exchange Nord Pool was established in 1996, and there is now a common Nordic wholesale electricity market. Competition and possibilities for exchange of power ensure that the most efficient generating resource is being used at any given time. For instance, Statkraft, as a producer of mainly hydropower, can buy thermal power generation from countries near Norway in times of low precipitation. Then, in periods of adequate reservoir levels, the comparatively low cost of hydropower causes the market to prefer this energy source over thermal generation. If one country is unable to satisfy demand from its own output, it can import the necessary power from a neighbouring country. Norway generally sells electricity during the day and at peak load periods, when prices are high abroad, and buys at night or other base load prices, when prices are low (Johnsen et al. 2008:10). With no limits in transmission capacity, there would have been a common price in all of northern Europe. But, since the transmission grid is not 'perfect' in physical capacity, bottlenecks arise and different price areas emerge (Johnsen et al. 2008:11).

A single European energy market is still far from reality, but the European (or Continental) power market is becoming increasingly opened and liberalized (Eikeland, forthcoming 2011). The first electricity and gas directives were adopted in the EU in the late 1990s, aimed at opening up the gas and electricity markets by gradually introducing competition. Two additional energy packages came in the 2000s. The liberalization of the energy sector has opened up for foreign investors, stimulating the growth of very large companies with geographically wide-ranging interests (Skjold 2009:228). A liberalized energy market is also

a precondition for the carbon market, as free trade of allowances is essential to achieve reductions where it is cheapest. Here I will not delve further into this deregulation process, only conclude by saying that today's Statkraft operates in a Nordic and a European power market that has been increasingly liberalized in the 1990s and 2000s.

4.4 Summary

The first part of this chapter described and discussed the EU's attempts to reduce the negative environmental impact from the power sector, through the creation of a cap-and-trade system and greater promotion of renewable energy sources. The EU adopted the ETS in 2003; the first trading period was in 2005–2007; the current phase runs from 2008 to 2012. The carbon price fluctuated significantly between 2005 and 2009, but the EU nevertheless proved that it was able to put a price on carbon. In 2008, the EU ETS was significantly reformed, with a more stringent and harmonized scheme for the trading period 2013–2020. Changes entail a more stringent EU-wide cap on emissions, auctioning of allowances as the general principle for allocation, and longer trading periods. The revision is expected to result in a scarcity of allowances and higher allowance prices, together with reduced windfall profits for the power sector (which must buy its allowances from 2013). It is anticipated that the new EUS will increase incentives to reduce emissions and spur low-carbon innovations in the EU[12].

The EU's policy on renewables experienced a breakthrough in 2001, with a directive for the promotion of renewable energy in electricity production. Although weak and non-binding, it marked the beginning of ever-stronger signals from the EU that the demand for renewable energy should and will increase. The RES commitment was strengthened in 2007–2009, with new targets (20%) and a new directive to promote the production of renewable energy. When each member state is required to increase its share of renewable energy, an incentive to

[12] Developments in 2010, related to observed effects of the financial crisis on the future EU ETS, will not be discussed here, as it falls outside the period under study. It is however important to underline that the hopes of increased stringency from phase III of the ETS were somewhat moderated in 2010, when numbers showed that the global recession had caused emissions (and carbon prices) to fall so much that the 20% target was no longer able to stimulate the long term investment in low carbon technology needed (EU Energy 2010). This has fuelled an intensive debate on whether the EU should move to a 30% target, or reduce the imports of credits, so to make sure that the EU ETS cap is stringent enough in the third phase.

establish support schemes is created, and the demand for such energy production is expected to increase.

The second part of the chapter showed that state involvement in electricity supply in Norway goes back to the early 20th century, and thanks to Norway's enormous water resources, Statkraft has historically been a producer of hydropower. The company has also developed a formidable expertise in trading and market analysis, because Norway was early involved in the deregulation of energy markets. Today's Statkraft is a 100% state-owned company operating in an increasingly deregulated Nordic and European market, aiming to function as a commercial enterprise. Internationalization is the keyword for Statkraft in the 2000s, together with developing its climate strategy. That is the topic of the next chapter.

5. Changes in Statkraft's climate strategy

This chapter presents my findings on the first research question, *Has Statkraft's climate strategy changed in the period 2003 to 2009? And if so, how?* I will place Statkraft's climate strategy on the continuum from 'defensive' to 'innovative' (see section 2.1.2). Change in climate strategy will be measured through four indicators: climate-related changes in 1) overall corporate strategy and vision, 2) organization, 3) investments and 4) innovation (see section 2.1.2). Section 5.5 sums up the main finding of the chapter: Statkraft's climate strategy has become increasingly offensive in the period under study, especially as regards long-term climate strategy.

First, however, some comments on the operationalization and the measurement of the concept 'climate strategy'. In 2003, one hundred per cent of Statkraft's energy production came from renewable energy sources, and since 2008 it has been the biggest renewable producer in Europe. That makes it somewhat difficult to draw a line between Statkraft's climate strategy and its general, overall business strategy – the very core of the company is 'climate-related'. I have decided to look for climate-related changes in Statkraft especially in relation to its strategy for power-generation technologies – the energy sources and products on which Statkraft concentrates its business. Statkraft differentiates between flexible power generation, such as large-scale hydropower and gas power, and new renewable technologies that provide only limited flexibility, such as wind or solar power. Both groups of power generation can be said to be 'clean' or at least climate-related, so the company's strategy in both areas falls under my definition of 'climate strategy'.

5.1 Changes in overall corporate vision and strategy

Climate-related changes in overall corporate vision and strategy have been mapped using both quantitative and qualitative methods. The quantitative analysis shows an increase in climate-related attention and awareness in Statkraft in the period 2003–2009; the qualitative analysis backs up these findings and places Statkraft's climate strategy more specifically in the 'offensive' category on the continuum.

5.1.1 Preliminary quantitative analysis

The aim of the quantitative analysis was to get a first impression of whether there have been changes in the attention Statkraft devotes to climate-related issues. I did a quantitative document analysis to see whether the wording in the company's annual reports has changed, as that can indicate whether there has been a shift in rhetoric and focus.[13] How many times do the terms 'CO_2', 'quotas', 'greenhouse gas' and 'climate' occur in the reports? These were the key words selected, but others could also have been chosen, like 'emissions' or 'carbon'. Table 3 presents the results of the analysis.

Table 3: Climate-related word count, Statkraft Annual Reports 2004–2008[14]

	CO2	QUOTAS	GREENHOUSE GAS	CLIMATE
2004	3	2	6	3
2005	5	18	23	10
2006	13	22	26	11
2007	40	24	***35***	***31***
2008	***50***	***31***	24	25

This word count was not contextually based – the word 'climate', for instance, can also be used in the sense of 'the prevalent psychological/social state', as in 'the climate for discussions was not good'. That problem is likely to be minimal here, as most of the terms counted are used primarily in connection with climate-related topics. Additionally, as discussed in chapter 3, we should bear in mind what sort of document an annual report is – it is a comprehensive self-report on a company's activities throughout the preceding year, to inform shareholders and others about its state and priorities.

Media coverage is another quantitative way of investigating changes in Statkraft's strategy and focus. How much media space do climate-related issues get? That is, of course, not a valid source for checking whether the company actually changed – there may have been a lot written on how Statkraft *ought to* change, what might affect it, what others think of the company and so on. I have still done this analysis, to see whether climate-related issues and Statkraft have become more closely associated in recent years. Again, other terms could have

[13] Inspired by Liv Arntzen Løchen's (2010) thesis on changes in E.ON's climate strategy.

[14] Statkraft's annual reports have become steadily longer: 61 pp. (2004), 118 pp. (2005), 112 pp. (2006), 128 pp. (2007), 140 pp. (2008).

been chosen, but a selection had to be made. I tracked the changes back to 1999, to get a clearer context for changes in the period 2003–2009.

Table 4: Media coverage of Statkraft and climate-related issues[15]

YEAR	STATKRAFT + KLIMA*	STATKRAFT + KVOTE*	STATKRAFT + FORNYBAR*	STATKRAFT + INNOVASJON*
1999	15	16	11	4
2000	23	14	16	1
2001	22	7	38	3
2002	17	7	29	4
2003	24	8	47	3
2004	29	19	50	12
2005	49	34	51	19
2006	45	28	76	35
2007	153	***62***	161	38
2008	149	49	168	36
2009	***239***	34	***349***	***55***

Both these analyses show a clear increase in attention given to climate change and related policy instruments (like the quota system), with a marked leap from 2006 to 2007. These analyses function as a first indication of where Statkraft's climate strategy can be placed on the continuum. These findings are not compatible with an 'indifferent' strategy, as there has clearly been a climate focus (at least in rhetoric) in Statkraft in the period 2003–2009. However, even if the analyses show an increase in attention and rhetoric, this evidence is still not enough to conclude that Statkraft's climate strategy *actually* changed between 2004 and 2009, or to say something about what caused this change – the relative explanatory power of the EU ETS and/or other factors. What this quantitative analysis has *indicated* is that there has been a change in the overall corporate vision and strategy. I will use the rest of this section to back up this finding with qualitative pieces of evidence. Various explanations will be discussed in chapter 6-8.

[15] Searches were conducted in the Retriever Research database ('Atekst') in Norwegian newspapers (on paper) from 1.1 every year, to 31.12 every year. The Norwegian words translate as 'climate', 'quota', 'renewable' and 'innovation' in English. The marked increase in the use of 'kvote' in 2007 can be ascribed to the widespread discussions of allowance allocation and the future profitability of the Kårstø gas-fired power plant.

5.1.2 Qualitative analysis

Climate-related changes in overall corporate strategy and vision have also been mapped using qualitative analyses of documents and interviews.

Statkraft's *overall vision and strategy* have been based on largely the same premises throughout the 2000s. The vision in the period 2003–2007 was 'to be a European leader in environmentally-friendly energy' (Statkraft Annual Report 2003). This vision was retained, but when the 'E.ON swap' made Statkraft the biggest renewable energy company in Europe, the wording was (necessarily) changed to: 'As Europe's leader in renewables we will meet the world's need for pure energy' (Statkraft Annual Report 2008). Also the basic elements of the strategy behind this vision have remained constant in the period 2003–2009. Throughout these years, Statkraft has been a major producer of hydropower and renewable energy in Europe, and the overarching goal has been to maintain and further develop this position.

On the other hand, there have also been some meaningful adjustments in overall corporate strategy during these years, with three 'official' revisions: in 2004, in 2006 and in 2008. While some parts of the strategy have been reinforced or strengthened, others have been downgraded or weakened. We now turn to four of these adjustments that can be seen as climate-related: 1) a reinforcement of Statkraft as a flexible producer, 2) a stronger focus on Statkraft's possibilities to provide the world with *new* renewable energy, 3) changes in communications and recruitment strategy, and 4) a changed way of scenario thinking. The aim of the section as a whole is to see whether there has been a change in what Statkraft stresses as its strategic priorities and what it highlights as the major strategic determinants for the company. The changes described in this section are mainly *long-term* and intended strategies – they are plans for how Statkraft sees itself developing in the future.

Statkraft as a flexible producer

Statkraft has shown renewed interest in generating capacity in the 2000s, and has continued to work on establishing its role as a *European swing producer.* A 'swing producer' (or 'flexible producer') invests in order to enter the market when fluctuations in demand prices make it attractive to do so (Skjold 2009:238). Statkraft is first and foremost – historically and today – a hydropower producer. Hydropower plants entail a remarkable flexibility (compared to the thermal energy sources on the continent), with high regulation ability and substantial

reservoir capacity. Hydroelectric stations with reservoirs have an important function in boosting power production from other renewable energy sources such as wind and solar energy, as hydropower can easily be turned on and off depending on when it is needed (i.e. on when there is no wind or little sunshine). Statkraft's strategy of being 'Europe's battery' and a peak supplier has been reinforced and more clearly communicated throughout the period 2003–2009. Here its greatest advantage lies in being able to supply the market in periods of high consumption or reduced production from less flexible power plants. Gas power has some of the same advantages as hydropower when it comes to flexibility. As Ingelise Arntsen of EVP Energy said to *Fossekallen* in 2005 (issue no. 3:4): 'The [gas] plants we are building in Norway and Germany can be turned up and down relatively quickly, and can follow fluctuations in the market more rapidly than coal-fired power plants, which require more time to adjust'. Today, being a European swing producer means both that Statkraft wants to optimize and increase its hydropower production, and that it wants to develop new gas-fired power-plant capacity.

New renewables and innovation

> Of course, Statkraft had for a long time understood the worth of owning industrial plants generating only clean and renewable energy. But, in line with the increasing environmental awareness in the new millennium, Statkraft committed itself *much more strongly* to promote new solutions to the problems associated with developing new, renewable energy sources [my emphasis]. Increasingly, its goal is to be seen as an environmental beacon in a Europe still dependent on nuclear and coal-derived energy (Skjold 2009:234).

Technological diversification became increasingly important for Statkraft in the period 2003–2009. When the company's strategic platform was revised in 2004, it was concluded that the focus should be on three main areas: 1) flexible and environmentally-friendly energy production, 2) construction of wind power and other renewables, 3) acquisition of shareholdings in Norwegian companies (Statkraft Annual Report 2004:23). This is a clear continuation of the company's previous strategy, but what is worth noticing is the new and explicit focus on wind power and other new renewables. Statkraft also undertook a major revision of its strategy in 2006, and this time even greater emphasis was put on new renewables, innovation and R&D, in order to 'offer the environment-friendly energy solutions of the tomorrow' (Statkraft Annual Report 2006). Statkraft started focusing on solar power in 2008 and 2009, aiming to become a major player within solar power,

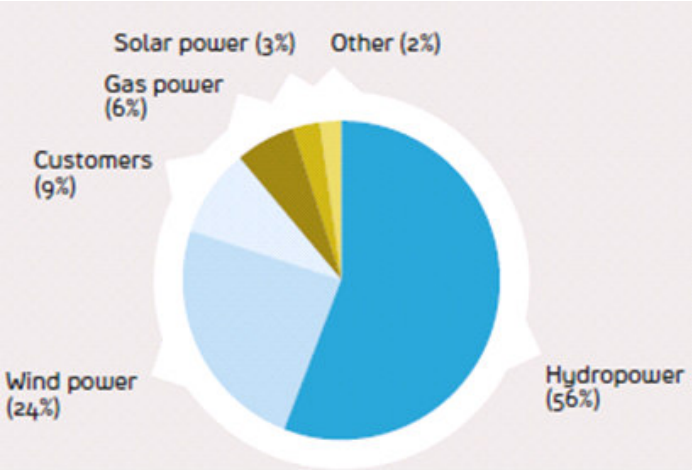
especially with its plants in Italy and Spain (Statkraft Annual Report 2008:5). The objective is to establish a combined production capacity of 75 MW in solar power by the end of 2012 (ibid.57).

Ambitious growth strategy for 2009–2015

Long-term plans of becoming increasingly involved in flexible and new renewable power generation in the 2000s culminated in 2008, when Statkraft prepared a new strategy for the period leading up to 2015. In order to maintain its leading position as a renewable generator in Europe, Statkraft aims at increasing the generation stack substantially in the coming years. The strategy '[…] paves the way for continued profitable growth within environmentally friendly and flexible power production both nationally and internationally (Statkraft Annual Report 2008:25). The strategy states three main directions for further development: 1) industrial developer in Norway, 2) European flexible producer, and 3) global green developer. The last two points are highly climate-related. The second point refers to Statkraft aiming to generate growth within hydropower and gas- power production in Western Europe. The third point refers to the desire to establish a strong niche position within international hydropower and within wind and other new renewable energy sources in Europe – like onshore and offshore wind, solar, wave, tidal and osmotic power (see figure 3). Internationalization is in many ways a prerequisite for this strategy – Statkraft is a Norwegian company with an increasingly international presence in the 2000s, and it will be necessary to look to Europe if the company is to have any possibilities of further growth and expansion.[16] From being a purely Norwegian hydropower producer, Statkraft is now seeking to become a European leader in environmentally-friendly energy.

[16] I return to the limitations for Statkraft's growth in Norway in section 7.1.1.

Figure 3: Expected investments, by technology, 2009–2015



(Source: Statkraft Annual Report 2008:36)

This 2009–2015 strategy is a good summary of the strategic adjustments made in the 2000s, and a quantification of the objectives set out in the years previous (Interviews 2010). Statkraft intends to invest between 80–100 NOK billion up until 2015 to realize this strategy (Statkraft Annual Report 2008:29). Some 85% of these investments are expected to relate to renewable energy, with the remainder going to maintenance, gas and other 'environment-enhancing' measures (ibid.). Only half of the total investments are planned for Norway. To be able to implement this strategy, Statkraft's board submitted a proposal to the Norwegian state (the owner) to increase the company's equity by NOK 8 billion and adjust the dividend policy to lie between 50% and 70% (Statkraft Annual Report 2008:21).

Communications and recruitment strategy

An important element of Statkraft's overall strategy is the way the company wants to be perceived by major stakeholders and the general public. Here we need to identify possible climate-related changes in communications and recruitment strategy, in order to fully describe what 'level of ambition' the company is communicating to its external environment.

'Building the Statkraft brand name' has been an important priority for Statkraft from 2006 onwards. According to CEO Bård Mikkelsen: 'We want to show people what Statkraft is really like […] Statkraft is an environmentally aware company, […] we want to make this more widely known to the general public' *(Fossekallen* 2006, no. 3:13). The core of the new communication strategy was to portray Statkraft as a leading contributor to clean energy in

Europe and in the world. The company stepped up its information and marketing campaigns in the period 2007–2009, under slogans like: 'The future can be bright' (Brende 2010). The Statkraft Group got a new look and visual profile, and 30 March 2007 a new logo was launched *(Fossekallen* 2007, no. 1), intended to communicate Statkraft's commitment to clean energy. Jon Brandsar (Executive Vice President, Wind Power and Technologies) expressed the following to *Fossekallen* (2007, no. 1:3): 'If we are to achieve our vision of being a European leader in environment-friendly energy, a familiar profile and a good reputation will be absolutely crucial'.

The greener communication profile has also implied an explicit focus on socio-political actions. Statkraft participated in several climate-specific initiatives in this period – notably in 2009, when it attended the Copenhagen summit (COP 15) and, together with the environmental NGO Bellona, presented a list of 101 solutions to climate challenges (Statkraft 2009a). Statkraft has also entered into an agreement with the World Wildlife Fund for the promotion of sustainable energy. These initiatives show that Statkraft wants to be seen as a pro-active organization that takes the climate challenge seriously and puts pressure on policy-makers to adopt a more stringent climate policy. But first of all, Statkraft wants to be perceived as an essential part of the solution. As expressed by CEO Bård Mikkelsen before the Copenhagen summit:

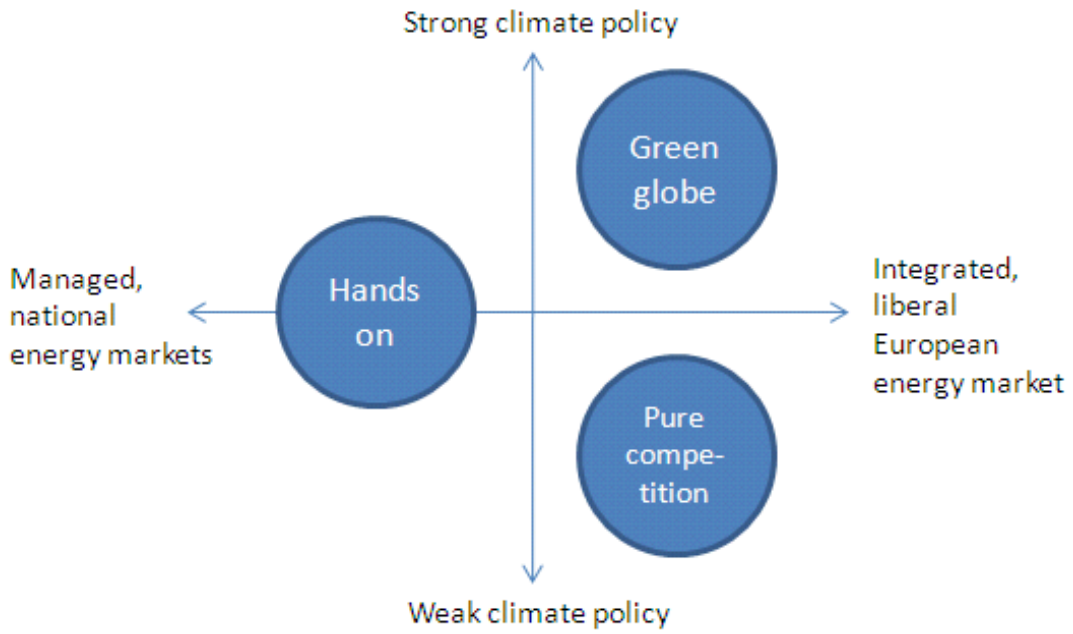
> The Copenhagen summit represents an excellent opportunity for Statkraft to present and discuss solutions with politicians, climate experts and media from all over the world. Our planet is in trouble, and Statkraft will contribute in the work to help find the solutions for the future (Statkraft 2009a).

This 'greening of image' has also influenced Statkraft's recruitment strategy. The company has worked hard on its 'brand name' and image in the 2000s, among other things seeking to attract new employees under headings like 'Do you want to work with clean energy?', 'Choose a job where you can make a difference', and 'The future looks bright when you're working with pure energy' (Brende 2010). This contrasts with recruitment strategy in the early 2000s, when little was said about 'clean energy', the environment and so on.[17] Thus we see a clear development in the 2000s as to the kind employer Statkraft wants to be seen as being, with a focus on the company as a 'green' and forward-looking place to work.

Scenario thinking and new strategic determinants

Finally, this picture of changes in overall corporate strategy can be elaborated on by seeing what Statkraft considers as *determinants* for its strategic development. Important in the period 2003–2009 are the changes in Statkraft's scenario thinking. The company undertook one scenario process in 2005/2006 and another in 2009 (Interviews 2010). Scenario thinking is a strategic planning method that can be used to capture a whole range of possibilities in rich detail, making it easier to devise flexible long-term plans. 'Scenarios' are consistent and complete pictures of the future, including analyses of how various driving forces affect each other. 'By identifying basic trends and uncertainties a manager can construct a series of scenarios that will help to compensate for the usual errors in decision-making – overconfidence and tunnel vision' (Schoemaker 1995:25). Statkraft developed three scenarios in 2006 (figure 4) to manage market development risk, based on assumptions of a changing European energy scene:

Figure 4: Statkraft scenarios, 2006

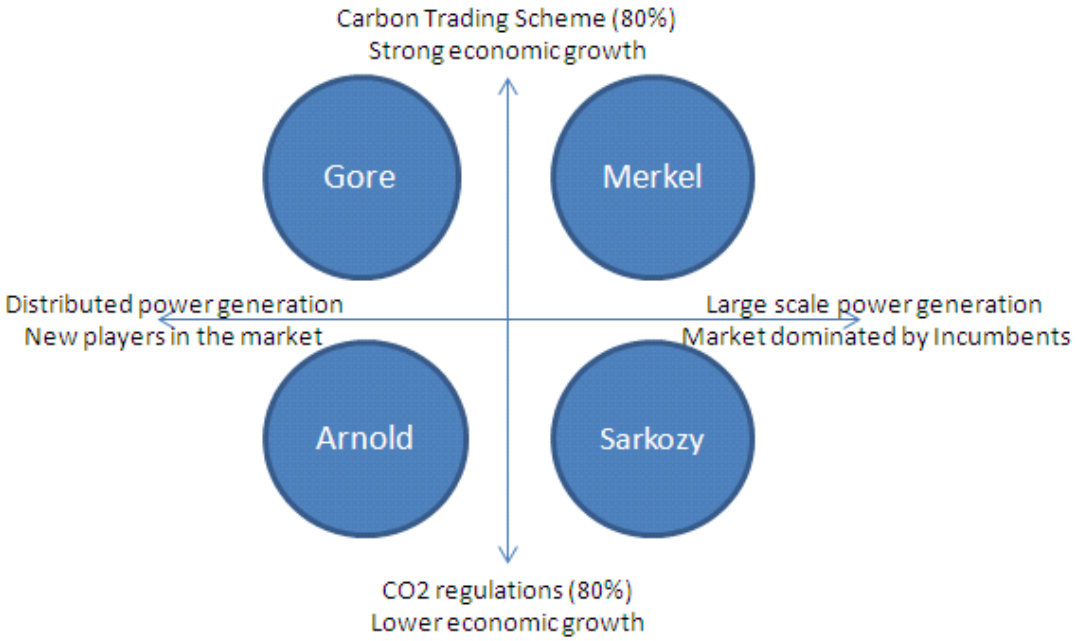


(Source: Ulseth 2007)

[17] In an article in *Fossekallen* (2002, no. 5), Statkraft announced that it wanted to attract young and skilled employees. The company's list of good reasons for choosing Statkraft included positive core values, interdisciplinary, possibilities for working abroad etc. – with no explicit focus on the 'greenness' of the company.

The company predicted three possible futures: a highly regulated and national 'hands on' management of energy markets, a liberalized energy market, or an energy market characterized primarily by strong climate policy (Interviews 2010). However, by the time of the next scenario process, in 2009, the EU's climate policy instruments were seen as the major driving forces in the power market (Statkraft Annual Report 2008:32), and all possible future scenarios were set within a 'green globe' (see figure 5). The EU was perceived as the 'leader' and most important agenda-setter within this 'green globe', but it was still vital for Statkraft to keep the focus global, both with regard to its engagement through SN Power, and because Statkraft saw a *global* carbon price as essential in the future (Interviews 2010). The point with the scenarios is to 'prepare' Statkraft – the company should be able to grow whether the 'climate winds' blow in the direction of Gore, Merkel, Arnold or Sarkozy[18] (People and Power 2009 no. 4:26).

Figure 5: Statkraft scenarios, 2009



(Source: Tzschoppe 2010)

[18] Statkraft decided to use political celebrities to name the scenarios, as they give other associations than mere words. 'Gore' is associated with a future of wind, gas, and solar, 'Schwarzenegger' with renewables and end-user measures, 'Merkel' with coal with carbon capture, and 'Sarkozy' with nuclear power, wind and gas (People and Power 2009, no. 4: 26)

5.1.3 Summary of changes in overall corporate vision and strategy

We have discussed the various climate-related changes in Statkraft's overall corporate vision and strategy during the period 2003–2009. It seems reasonable to conclude that the company's climate strategy has been increasingly offensive, perhaps even innovative, in the period studied. It is clear that the Statkraft has not adopted an indifferent climate-strategy; throughout the period, it has sought to utilize climate-related opportunities, and sees itself affected by the climate-change issue and regulations. A defensive strategy is also out of the question – Statkraft has adopted a pro-active approach, recognizing the challenges and offering to contribute to solutions.

This section has focused on the *long-term* climate strategy of Statkraft. The strategy adopted for the period 2009–2015 is clearly an ambitious programme for growth in renewables and flexible energy sources in the years to come. We have also noted some short-term changes, related mainly to communications and recruitment strategy, and scenario thinking. It is clear that Statkraft sees a potential for its core competitive advantage – clean energy – in the years to come, within the framework of a green globe with the EU as the major driving force.

5.2 Climate-related changes in organization

The organizational structure of a company is intended to back its strategic priorities, so the question now becomes: Has Statkraft adopted organizational changes that support an increasingly pro-active climate strategy in the period 2003–2009?

In July 2004, Statkraft became a limited liability company, Statkraft AS, and changed its overall organizational structure with effect from January 2005. Three new business areas with three key group functions were identified: a) generation and markets, b) new energy, and c) regional business. 'New Energy' was given responsibility for developing and constructing new, environmentally-friendly power-generation facilities in Norway and on the continent, and it was also put in charge of developing Statkraft's new gas portfolio and its R&D and innovation efforts. The business area was for some years divided into three sub-units: 'R&D', 'investments', and 'innovation'. By the end of 2006, 'New energy' had expanded its workforce from 24 to 52 (Statkraft Annual Report 2006:6). The 2007 Annual Report (p. 38) concludes that activity levels had increased considerably since the start in

2005 – both in Norway and in the rest of Europe. While 'New Energy' handled Statkraft's commitment to new renewables and innovation, 'Generation and markets' was in charge of hydropower, gas (once the power-plants had been built) and trading. The 'Regional' area managed Statkraft's shareholdings in other energy companies in Norway. As shown in table 5, 'Generation and Markets' was definitely the core business area:

Table 5: Statkraft's business areas in 2007

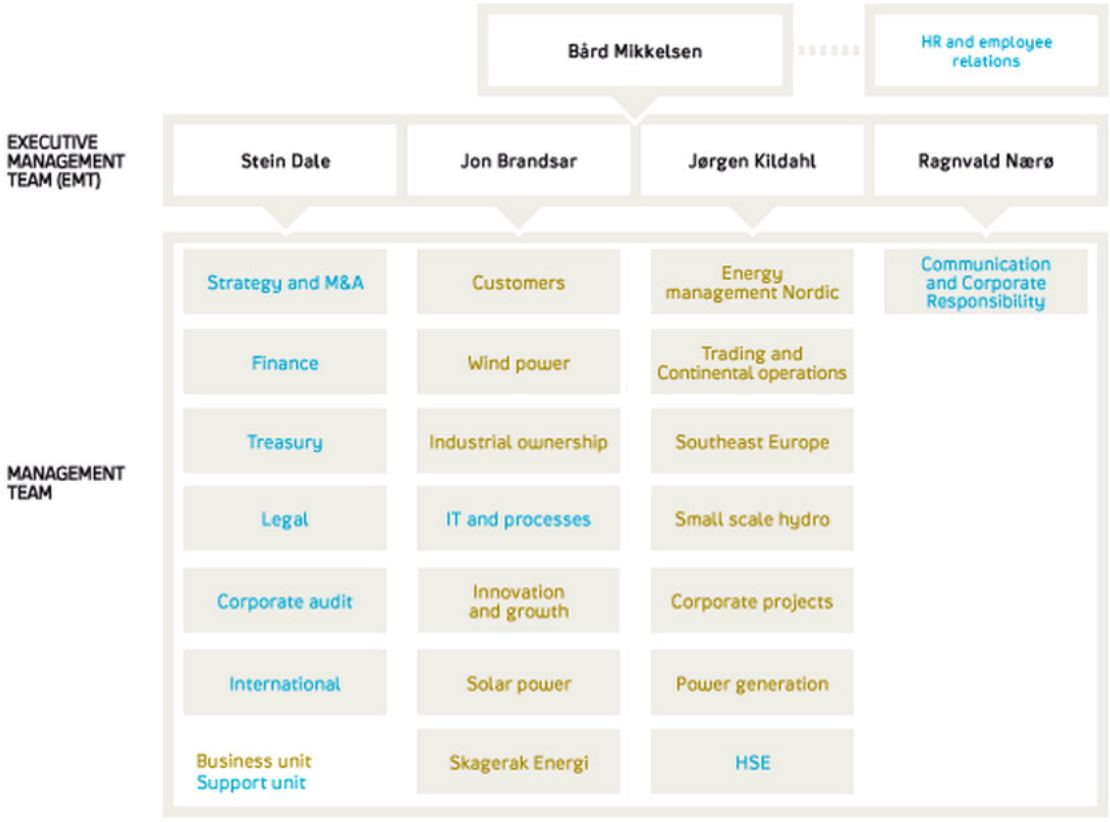
SEGMENT	SHARE OF GROSS OPERATING REVENUES	SHARE OF FULL-TIME JOB EQUIVALENTS	INSTALLED CAPACITY (MW)
Generation and Markets	63%	36%	9668
New Energy	5%	3%	245
Regional	39%	52%	5517

(Source: Statkraft Annual Report 2007:6)

This threefold organization structure was kept in 2005, 2006 and 2007, but Statkraft re-organized its activities with effect from 1 July 2008. It was considered disadvantageous to have two large and one very small business area, as 'New Energy' was becoming quite weak and hardly visible (Interviews 2010). Statkraft wanted to re-organize in order to support its long-term growth ambitions, not least to bring out the company's new emphasis on wind power, solar power, small-scale hydropower, innovation, and so on. According to the 2008 Annual Report (p. 25): 'The aim is to achieve a more flexible and dynamic organisation where new prioritisations and growth areas can be highlighted and made visible as separate business units with clear results responsibilities'. The new structure consisted of a large number of new business units, making Statkraft appear more diversified. Among the aims were to clarify the scope of the company's activities, give attention to new growth initiatives, and to highlight who was in control of what (Interviews 2010) (see figure 6). For instance, the new wind unit was given responsibility for developing, constructing and operating the ownership of onshore and offshore wind farms in Norway and elsewhere in Europe (Statkraft Annual report 2008:5). The 'old' generation and markets unit was split up, but continued to be the largest segment in total, responsible for hydropower and gas-fired power plants, and physical and financial trading in Europe. All in all, this organizational change represented change in an innovative direction, as the new business units indicated a stronger commitment towards the promotion of new growth initiatives related to innovation and new renewable

energy (Interviews 2010). This organizational structure was retained throughout the period studied here.

Figure 6: Statkraft's organization as from 1 July 2008



(Source: Statkraft Annual Report 2009)

5.3 Climate-related changes in investment policy

The next indicator for mapping possible climate-related changes in Statkraft is changes in investments. This indicator encompasses actual investments in power production capacity and other products Statkraft was engaged in during the years 2003 to 2009. The question here is related to short-term climate strategy: Has Statkraft grown primarily in accordance with its messages about producing environmentally-friendly energy in the period 2003–2009? Here we should bear in mind that the decisions behind investments in the 2000s were often taken several years earlier; still, it is interesting to see how the investments in generation capacity actually developed in this period.

Installed capacity in Statkraft increased significantly in the period under study. In 2003 the portfolio consisted solely of renewable energy, but since some non-renewable sources of energy have been added (Annual Report 2009: 89.1% renewables in 2009). The 2008 swap deal with E.ON is a central part of Statkraft's investment history, as it expanded the company's installed capacity by 2500 MW (Statkraft 2008). Statkraft has invested in wind power, gas power, small-scale hydropower (SHP), district heating and solar power in the period under study. Considerable amounts have also been invested in the upgrading and modernization of existing hydropower plants. Table 6 shows the development in installed capacity for the period 2005–2009[19].

Table 6: Installed capacity 2005-2009[20]

	2005	**2006**	**2007**	**2008**	**2009**
Installed capacity (MW)	11 150	11 213	12 355	15 478	15 806
- of which hydropower	10 683	10 676	10 573	12 546	12 774
- of which SHP	-	-	-	-	63
- of which wind power	205	245	245	245	305
- of which gas power	-	-	1 210	2 130	2 160
- of which solar power	-	-	-	-	3
- of which biofuels	-	-	-	16	16
- of which district heating	262	292	327	541	548

(Source: Statkraft Annual Reports 2008, 2009)

[19] Figures for 2003–2005 are missing, but almost all installed capacity in this period was in hydropower.

[20] Includes Statkraft's shareholding in subsidiaries where Statkraft has a majority interest. Small-scale hydropower has an installed capacity < 10 MW. Gas power here includes the jointly controlled Herdecke (Germany) and Kårstø (Norway) power plants.

5.3.1 Gas Power

In 2005, Statkraft decided to proceed with three gas projects – two in Germany and one in Norway. In June, Naturkraft (a 50/50 venture between Norway's Hydro and Statkraft) decided to go ahead with the construction of Norway's first gas-fired power plant (GFPP). Around the same time, Statkraft (alone) decided to build and operate a GFPP in Knapsack, Germany. Earlier that year, Statkraft also entered into an agreement with the German company Mark-E, on a 400 MW GFPP in Herdecke, Germany (Statkraft 50% owner). Statkraft CEO Bård Mikkelsen refers to the construction of GFPPs in Germany as '[…] a breakthrough for the presence in Europe, and a step in the direction of fulfilling the company's vision' (Statkraft Annual Report 2005:6). The construction of the three plants continued according to plan in 2006, and they were completed by the end of 2007, with a total installed capacity of 1200 MW. This marked the start of a new era for Statkraft, and the E.ON swap gave Statkraft two more GFPP. The construction of gas-fired power plants in Germany is Statkraft's largest investment since the Svartisen power plant in North Norway, in the early 1990s (Fossekallen 2005, no. 3).

Regarding Statkraft's gas power engagement, we should recall the two main ways of looking at gas power: 1) investing in gas power means investing in a carbon installation, and is hence a part of the climate change *problem;* 2) investing in gas power means investing in an environmentally-friendly alternative to other high-carbon-based energy sources, and is hence a part of the climate-change *solution* and a necessary bridge to a low-carbon energy system. Statkraft itself views gas as an environment-friendly energy source: 'gas power replaces far more polluting electricity generation facilities based on coal and oil' (Statkraft Annual Report 2006:3)[21].

5.3.2 Wind power and solar power

Statkraft has invested in wind power in both Norway and abroad in the period 2003–2009. In Norway, Hitra wind farm opened in December 2004; Phase II of Smøla opened in September

[21] According to the framework applied in this thesis, going into gas is compatible with the 'offensive' category, but not with the 'innovative' (cf. table 1). It is a carbon-based energy source and not considered as a solution in the long term. In today's Europe, however, many accept gas as a necessary bridge to a less carbon-intensive energy system, explaining why it is considered as 'offensive' in this thesis.

2005 (phase I had started in 2002), and Statkraft decided to build a wind farm at Kjøllefjord in Finnmark that same year. Since 2008, Statkraft has concentrated the development of Norwegian, land-based wind energy projects in SAE Vind, a joint venture with Agder Energy. Statkraft established a representation office in London in 2006 to intensify work on establishing a wind portfolio in the UK. Statkraft was granted its first wind-power licence in the UK in 2007 *(Fossekallen* 2007, no.2), and the company decided to build a wind farm in Wales in March 2008. Investments were directed to the Sheringham Shoal Offshore wind farm in 2009.

In 2008 and 2009, Statkraft also started to invest in solar power, mainly in Italy. Positioning started in autumn 2007, and by the end of March 2008, Statkraft was granted license to build a 3MW solar energy plant in Italy. In September 2009, Statkraft and an Italian company signed an agreement relating to the acquisition of eight ready-to-build solar-power projects in the Puglia region in southeastern Italy, with a total capacity of almost 20 MW. Energy production at Statkraft's first solar park, Casale south of Rome, started in December 2009 (Statkraft Annual Report 2009:5).

5.3.3 New trading commodities

In Statkraft, energy trading started with the establishment of Nord Pool in the 1990s. For the first years, the trading departments worked in fairly limited areas as regards geography and commodities. Its trading operations were expanded to include new products in the period 2003–2009. 'We have recently expanded our market operations. New products, such as green certificates and greenhouse gas quotas, have been included in our portfolio' (Statkraft Annual Report 2005:7). Trading in various energy commodities – some directly climate-related – provides Statkraft with valuable information about the European energy market. The trading is conducted at marketplaces like Nord Pool, the German power exchange (EXX) and so on. According to the 2006 Annual Report (p. 31): 'Trading in EU emission quotas (EUA) more than tripled compared with the year before, with more than 800 million emission quotas being traded in 2006.' Statkraft trades all types of carbon certificates permitted under the EU ETS; it participates in projects under the CDM and JI, and buys emission permits directly from such projects. As a part of the 2009–2015 strategy, Statkraft wants to 'increase its business within trading and origination in order to be able to offer new

project constructors more long-term power agreements and expand the company's carbon trading activities' (Annual Report 2008:37).

5.3.4 Summary of changes in investments

The above-mentioned investments, together with the E.ON swap in 2008, have transformed Statkraft. It now stands as Europe's largest producer of renewable energy, with one-fourth of its production outside of Norway *(People and Power* 2009, no.1:2). Actual investments in the period 2003–2009 have been in line with an offensive climate strategy, mainly within the fields of old renewables and gas. Statkraft is still overwhelmingly based on hydropower .The company has also invested in new renewable energy, but this represents a limited part of its total investments, and is thus not enough to place Statkraft in the 'innovative' category.

5.4 Climate-related changes in R&D and innovation

Even if actual investments fail to meet the criteria for the innovative category, it may be that Statkraft's long-term innovation plans and projects have been up-scaled sufficiently in the period under study for us to term the company 'innovative'. In line with changes in overall corporate strategy, increasing priority has been given to innovation and R&D (see section 5.1). The story of innovation in Statkraft can be separated into two distinct phases: before and after 2006 (Interviews 2010). Prior to 2006, innovation efforts were few and random. Statkraft tended to participate in initiatives taken by others, and the projects were small in scale.

This changed to some extent after 2006, when the owner (the Norwegian authorities) began inquiring what Statkraft was doing when it came to innovation (Interviews 2010). A new head of innovation efforts was appointed in the company, and more resources were directed to an innovation department (Interviews 2010). The question is, therefore, to what extent can Statkraft be said to be committed to climate-related innovation in the period studied in this thesis? How fundamental have the changes actually been?

5.4.1 Early initatives

Statkraft invested some amounts in innovation and R&D already in 2003 and 2004, especially through the above-mentioned business area 'New Energy'. According to the 2004 Annual Report (p. 22): 'Statkraft has devoted significant resources to the development of *tidal energy*, *osmotic power* and the use of *hydrogen* as an energy carrier', and 'Statkraft is currently a global leader in the field of osmotic power technology […]' (ibid.45). Osmotic power, marine technology and hydrogen remained key focal areas for development projects throughout 2005 and 2006. As noted in the 2005 Annual Report (p. 54): 'It is expected that hydrogen will play an important role as an energy carrier in the future'). NOK 46 million was spent on innovation and R&D in 2004 (Annual Report 2004).

A more detailed look at the projects and efforts mentioned in these annual reports makes it clear that they were still not an area of high actual priority for the company. Hydrogen as an energy carrier was for several years seen as a promising alternative to fossil fuels and batteries. As noted in *Fossekallen* (2004, no. 3:20) it says: 'We are highly optimistic because we know that this is an important solution for the environment, and because we know there will be a large market for hydrogen in the near future'. In 2005 it was declared that Statoil, Statkraft and DNV (Det Norske Veritas) were to establish a Norwegian hydrogen research and demonstration centre in Trondheim (Statkraft 2005). However, by mid-2007 came the announcement that the plans had been cancelled, because the necessary equipment proved more expensive than expected (Adresseavisen 2007). Since then, hydrogen has not been a part of Statkraft's innovation portfolio. As for osmosis, little effort was put into developing this technology prior to 2007 (see below).

5.4.2 Statkraft spurring its innovation efforts

In the mid-2000s, Statkraft's owner (the Norwegian state) began to ask what the company was doing in the innovation field, and demanded a more active attitude towards the issue (Interviews 2010). This coincided with the approach of certain individuals in Statkraft – former CEO Bård Mikkelsen[22] is being referred to as a 'friend of innovation' and a creative

[22] Bård Mikkelsen was CEO and President in Statkraft from 2001-2010.

leader who wanted to test new ideas and solutions (Interviews 2010). Statkraft decided to increase its investments in innovation and R&D in 2006, and a head of innovation efforts (SVP Innovation) was appointed (Statkraft Annual Report 2006:10). More resources became available at Statkraft's head office to allow it to become a driving force and coordinator for innovation efforts (ibid.57). The intention was to increase the focus on innovation in three ways: 1) increase awareness in order to intercept more ideas, 2) develop more renewable energy sources, and 3) develop qualified commercially-based ideas to a stage where they are attractive to investors or Statkraft's own organization (ibid.7). Generally speaking, the emphasis in the first few years after 2006 was on *creativity* ('letting all the innovative voices in the company be heard') and the process of identifying and developing good ideas (Interviews 2010). The budget for innovation and R&D in 2006 was NOK 65 million (Statkraft Annual Report 2006:57).

Statkraft continued to step up its initiatives within innovation and R&D in 2007, explaining this with the need of strengthening its long-term position as a leader in environmentally-friendly energy. The company established 'Innovation' as one of its core values in 2007, and elaborated on this by saying: 'Think creatively, develop opportunities and create solutions' (Statkraft 2007:2). With this, innovation was firmly placed as a central part of Statkraft's new communication strategy. Statkraft also decided to start the construction of the world's first prototype osmotic plant in 2007, after ten years of R&D in the field (Statkraft Annual Report 2007:7). That entailed an increase in focus and investments in developing this technology. Indeed, many refer to osmosis as one of the company's few 'successful' and promising innovation efforts in the 2000s – while others only refer to it as 'good publicity' (Interviews 2010). Additionally, Statkraft decided to start preparations for the construction of solar-power facilities in Italy and Spain in 2007, and it began collaborating with the Norwegian University of Science and Technology (NTNU) and several other Nordic universities on an extensive R&D programme within ocean energy. For Statkraft, the aim was to become Europe's leading network of skills and education in the field of ocean energy – in technologies like offshore wind power, wave power and tidal power (Statkraft Annual Report 2007:29). The budget for innovation between 2007 and 2009 was NOK 230 million.

With 2008 came a new turn of events in Statkraft's innovation efforts. The focus on idea generation and creativity of the period 2006–2007 was to some extent scaled down, with greater emphasis on innovation in relation to Statkraft's *core activities* – which meant

improving and strengthening existing activity areas instead of going after new, immature technologies. With the exception of osmotic power, only a limited number of R&D projects within aspiring technologies are foreseen in the 2009–2015 strategy. The *deployment* of existing climate-related technologies like hydropower, wind and gas, became more important. The ocean energy programme was nevertheless continued in 2008 and 2009, with priority to tidal power rather than wave power.

The osmotic plant at Tofte near Oslo was opened in November 2009 –an example of a Statkraft-led innovation project that has attracted considerable attention, both in Norway and internationally *(People and Power* 2009, no. 4). From 2009, the priorities within R&D were channelled through three programmes: ocean energy, hydropower and customer activities, and Statkraft participated in five research centres for environmentally friendly energy.[23] The budget for Statkraft's innovation projects for 2009–2011 is about NOK 500 million (Statkraft Annual Report 2009:17), more double that for the period 2007–09 (NOK 230 million).

Summing up, it is clear that Statkraft was both talking and investing more in innovation and R&D in 2009 than in 2003, with a marked shift in 2006. Another turn came in 2008, with the deployment of existing technologies prioritized at the expense of the previous focus on idea-generation and new technologies. However, it is still safe to say that Statkraft's innovation initiatives are small compared to its core activities, and priority goes to innovation related to improving old renewable energy rather than innovation on new renewable energy.

5.5 Conclusion: an 'offensive' company, not yet 'innovative'

This chapter has argued that Statkraft's climate strategy can be categorized as 'offensive' in the period 2003–2009. The 'indifferent' category was ruled out already in the preliminary quantitative analysis, which showed that Statkraft's attention towards climate-related issues had increased considerably in the period under study. The 'defensive' category was excluded in the qualitative analysis of changes in overall corporate strategy and vision, which showed

[23] The five research centers focus on hydropower, bio-energy, marine energy, wind power and gas power (CCS) (Statkraft Annual Report 2009).

that Statkraft welcomes the rising demand for renewable energy, and has planned for growth in flexible and renewable energy sources. However, on the basis of my criteria (see table 1), we may not yet speak of a generally *innovative* strategy in the case of Statkraft. This is generally due to two observed factors: 1) investments have been directed mainly towards gas and *old* renewable energy, despite some small investments in wind and solar power; and 2) innovation and R&D of new technologies has remained an area of relatively low priority, despite an upscaling since 2006. Many innovation projects have been finished without successful implementation (as was the case of the hydrogen project). After 2008, Statkraft went from focusing on the development of new technologies, to the deployment of well-known climate-related technologies.

The reasons for calling the climate strategy *increasingly offensive* relate mainly to Statkraft's long-term plans. The strategy for 2009–2015 signals major investments (NOK 80–100 billion) in 'clean energy' in the years to come. The 'offensive' category is also appropriate in view of the investments in hydro, wind and gas power in the short term, and the more successful innovation projects related to, for instance, osmosis and ocean energy. Beyond doubt, Statkraft has started to take increasing advantage of its position within hydropower and clean energy, and its communications strategy focuses on portraying the company as a power producer with the solutions for the future.

The three next chapters examine and explain these observed changes in the company's climate strategy, within the framework of a multi-level approach that sees corporate changes as influenced from the international, national, and company levels. The influence of EU factors is central to this thesis, as I seek to identify how the EU ETS and other policies have impacted on the climate strategy of Statkraft.

6. The EU level

EU energy and climate policy for the period leading up to 2020 is expected to form the basis for Statkraft's growth in respect of renewable energy and flexible power production. This includes stricter greenhouse gas emissions standards, higher targets in terms of the expansion of renewable energy and a more integrated European energy market' (Statkraft Annual Report, 2007:29).

This chapter discusses the second research question: 'To what extent and how can the EU ETS explain these changes [in Statkraft's climate strategy]?' As the overall aim of this thesis is to broaden our understanding of the effects of the EU's Emissions Trading Scheme (EU ETS), in this chapter we analyse changes in Statkraft's climate strategy as a function of factors from the EU level in general, and traits of the EU ETS in particular. We will look at how the EU ETS has influenced Statkraft's climate strategy by asking: What parts of Statkraft's climate strategy can be ascribed directly to the EU ETS? How has the EU ETS as a part of the EU's wider climate and energy policy affected Statkraft's climate strategy? The first point refers to the *specific effects* of the EU ETS; the second, to the *diffuse effects* of the trading scheme in the context of a wider policy.

Recalling the propositions discussed in chapter 2, we assume that the EU ETS provides Statkraft with few risks, but potentially many opportunities. The extent and shape of these opportunities are expected to be closely connected to stringency, predictability and complementarity. The more *stringent* and *predictable* the EU ETS is, the more likely will Statkraft be to adopt an innovative climate strategy (H1 and H2). The overall *complementarity* of the EU's climate policy will also affect the company's preferred strategy – the more coherent this climate policy is perceived by Statkraft, the more likely will an innovative climate strategy be (H3). The analysis in this chapter builds directly on the introduction to EU climate policy given in chapter 4.

I begin by discussing two specific effects of the EU ETS (on Statkraft's price analyses and investment decisions, and on its trading activities), drawing on the concepts of stringency and predictability. We will see that the EU ETS has offered Statkraft a range of new possibilities, especially related to the anticipation of long-term changes in the scheme. The second part of this chapter demonstrates how the EU's wider climate and energy policy has

served to underpin Statkraft's vision and strategy throughout the 2000s, especially as regards the greater stringency and predictability introduced with the 20–20–20 goals in 2007.

6.1 Specific effects of the EU ETS

Recalling the discussion of the changes in Statkraft's climate strategy in the period 2003–2009 from chapter 5), we now turn to the extent to which, and how, the EU ETS has influenced this development. We will see that, while it might be too soon to see far-reaching direct effects of the EU ETS, the future prospects are likely to have affected Statkraft's long term strategy.

6.1.1 Establishing a price on carbon

The EU ETS establishes a price on carbon, and this has had – and is expected to continue to have – an effect on power prices in general. The carbon price also affects the relative cost differences and profitability of various energy sources. Both these aspects of the EU ETS have an impact on Statkraft's climate strategy.

Affecting the power price

How does the EU ETS – a scheme that mainly covers large emitters in continental Europe – affect power prices in Norway? The EU ETS creates a price on CO_2 (the level of this price is a function of the scheme's overall stringency, cf. section 4.2.1 in this study), and this price becomes a cost component for installations covered by the scheme. Higher marginal costs for coal-, oil-, and gas-fired power plants will increase general power prices[24] (see e.g. Johnsen et al. 2008). Norway is active in the Nordic and North European power markets, and even if Norwegian power production is largely carbon-free, the price of CO_2 still affects power prices in the countries Norway trades power with. The costs of CO_2 influence Norwegian power prices indirectly, through their effects on import and export prices.

[24] It is hard to isolate the effect of the carbon price on general power prices, as these are affected by several other factors as well – fuel prices, precipitation levels etc.

The CO_2 pass-through into electricity prices may well have led to increased revenues for Statkraft. The issue of windfall profits (when energy producers pass on the price of allowances to their customers, even though they did not pay for these allowances themselves), is not so relevant in the case of Statkraft, but the company has profited from the general increase in power prices. Zhang and Wei (2010:1810) write:

> […] emissions trading resulted in large windfall profits, much but not all which was due to free allocation of allowances. Profits also increased for some generators because their generation mix had low emissions and so they benefited from power price increases.

I have not been able to find any figures on how much Statkraft has/is likely to have earned as a result of CO_2 pass-through into electricity prices. Some evidence, however, would indicate that the profits have been considerable. For instance, 2005 was a wet year, which normally means low prices for Statkraft's electricity. However, despite the low precipitation, 'we record the fourth highest annual prices in the history of Nord Pool. The main explanation is CO_2' *(Fossekallen* 2005, no. 4:26). After the adoption of the revised ETS, several Norwegian newspapers wrote of the expected increase in power prices. Knut Fjerdingstad, spokesperson in Statkraft, said to *Stavanger Aftenblad* (2008): 'Beyond doubt, we are well-placed. Norway will now get paid for what hydropower is worth, seen in an environmental perspective'. He went on to say that the company had made some estimates of the likely profits, but would not reveal any figures, due to competitiveness concerns.

Although increased revenues as a result of the EU ETS may not fall strictly under the definition of 'climate strategy', they are nevertheless important in explaining why Statkraft has been positive towards the new carbon market (Interviews 2010). The increased revenues also contribute to more resources for investments, making the carbon price a part of the backdrop to the company's investment possibilities and decisions.

Indirectly affecting investments

Perhaps even more interesting, in terms of this study's focus on climate strategy, is how the EU ETS has become an important element in price analyses, and hence in investment decisions. The analysis department in Statkraft supplies both short-term and long-term power-price forecasts to all parts of the organization, and has become increasingly aware of the EU ETS as a price driver. As chief analyst Anne Vera Skrivarhaug said to *Fossekallen* (2007, no. 4:28): 'In the long term, the CO_2 quota system is the real joker in the pack – along

with the deregulation of the European gas market. As a result, we are following the political debates closely.'

Statkraft has followed the political debates for many years, and took notice of the EU ETS already in 2003. According to the Annual Report (2003:17) for that year, 'the EU has adopted a quota system for the entire union, which will enter into force in 2005', commenting on the consequences for the power sector as follows:

> By increasing the production costs for power based on fossil fuels through CO_2 prices and by reducing the production costs for power based on renewable sources of energy through various forms of subsidy, power based on fossil fuels will become less competitive.

This argument is further specified in 2005: 'Since Statkraft's production is largely carbon free, this [the EU ETS] makes the company's output of hydropower and wind power more profitable' (Annual Report 2005:31). But has the EU ETS encouraged investments in clean technologies thus far? I have not found anything to indicate that Statkraft has made investments in recent years solely because of the EU ETS; or that it has refrained from investing because of the EU ETS (Interviews 2010). This is of course because a whole range of variables must be taken into account when investment decisions are taken (with the carbon price merely one of many components), but it is also due to the relatively low and unstable carbon price (Interviews 2010). The EU ETS has been characterized by considerable uncertainty since its start in 2005, and the price of allowances collapsed in 2007 (Point Carbon 2010:3). The carbon price has not been high enough, for example, to create incentives for wind energy to develop without a need for further financial support (Blanco and Rodrigues 2008). Thus far, the EU ETS has served only as a fuel-switch from coal to gas – and until carbon prices meet the levels of support schemes, there will be no switch from gas to renewables. To make wind and other new renewables profitable, the carbon price must be so high that it displaces both coal and gas (Interviews 2010). This same argument has been made by the International Energy Agency:

> If CCGT [combined cycle gas turbine] is compared with non-emitting technologies, the CO_2 price has to be in the range of €30 to €200 per tonne of CO_2 for renewable technologies to become competitive. For most renewable technologies therefore, other policies need to be enacted to increase renewables' market share (IEA 2003:9).

Statkraft was not directly subject to the EU ETS when it was adopted in 2005, but going into gas power in 2007 put the company in a compliance position. Statkraft knew this already from the adoption of the scheme in 2003, but saw it as no reason for stopping its planned

gas-power projects (Interviews 2010). On the contrary, it is possible to claim that the EU ETS made gas investments *even more* attractive for the company, as the scheme is primarily a fuel-switch mechanism, from coal to gas. The EU ETS can contribute to making gas more beneficial than coal, as products causing lower CO_2 emissions will be cheaper than products that cause higher emissions. Gas-fired power plants have the lowest carbon emissions of all power plants that rely on combustion of fossil fuels – coal plants emit more than twice the CO_2 than gas power plants to produce one kWh (IEA 2003:6). So, if carbon prices are high enough, gas power will be more profitable than coal power.[25]

Statkraft expects the EU ETS to have a growing impact on investments in the years to come: 'The establishment of a European market for carbon emission quotas has had a major impact on price formation in Europe's energy markets, and is also expected to have a growing impact on new investments' (Annual Report 2006:30). This anticipation has been especially clear in Statkraft since 2007, when the EU established the goal of a 20% reduction in CO_2 emissions by 2020, increasing the predictability of the EU ETS. According to Statkraft's 2007 Annual Report (p. 30), there 'appears to be little doubt that European emission allowance trading will continue towards 2020', and that this 'will provide predictability for new investments in the electricity sector'. The timeframe of 2020 is suits Statkraft well – not too short (as 2012 would be), and not too long (as 2050 would have been) (Interviews 2010). The EU has also signalled that it intends continue its policy beyond 2020, which is reassuring for investments in the power sector. In the long term, the EU ETS is one of several important factors for Statkraft to take into consideration when making investment decisions, as a higher power price will make more projects profitable (Interviews 2010). Some technologies will be more attractive, and some less – since differing amounts of carbon in energy sources mean differing effects of the carbon price for the producers. These

[25] The situation is complicated by the fact that high gas prices are an important factor in driving up the price of carbon. When gas prices rise sharply compared with coal prices, gas power becomes less competitive than coal-based power. (Statkraft Annual Report 2005:29). The criteria for allocating allowances (EUAs) are also important, as they affect how the electricity market sets prices and consequently which energy carriers will be chosen when new capacity is built. Statkraft has emphasized the need to treat the coal power and the gas power sectors differently under the EU ETS. If coal-fired power plants were to get a favourable allocation of allowances, that could, particularly in combination with high gas prices, have a negative impact on the competitiveness of gas power plants (Statkraft Annual Report 2006:28). Statkraft has been active in the discussion of allocation of allowances under the EU ETS, both in Germany and in Norway.

considerations were taken into account in Statkraft's 2009 scenario process, when the 'green globe' was used as a starting point:

> The EU's climate policy is decisive for the development of the European energy market, and formed the basis for Statkraft's analysis department in their work to identify four different scenarios which describe various solutions in energy and climate in the future. 'We have posed the following question: What are the most important forces for change, and which of them will have the greatest impact on the development of the energy market,' says analysis manager Bente Haaland *(People and Power* 2009, no. 4:27).

The four scenarios (presented in section 5.1.2) include several possible futures for EU climate policy – depending on, *inter alia,* the development of the carbon price and national support schemes for renewables (Interviews 2010). The 2007 and 2008 revisions of company climate policy nevertheless enabled Statkraft to make price forecasts, scenarios and adjustments in risk management. After 2007, Statkraft simply paid much more attention to EU climate policy (Interviews 2010).

Summing up, in the short term, the EU ETS has been neither stringent nor predictable enough to have a direct impact on investments. It has nevertheless been included as an essential variable in all Statkraft's price forecasts, and the CO_2 pass-through into electricity prices has meant greater revenues for Statkraft. It is important to recognize that the three first years of the EU ETS constituted a 'trial phase', and the EU did not expect great changes in the power system in those initial years.

Anticipations of a future EU ETS that is more stringent (resulting in a *higher* carbon price) and a more predictable (a more *stable* carbon price) are likely to have impacted Statkraft's long-term plans – supporting 'offensive' investments in gas and renewable energy. However, considerable uncertainty still surrounds EU climate policy, as evident in Statkraft's four scenarios. Different drivers will result in fundamentally different futures for the power sector. Many factors will influence the future carbon price, like the effects of the financial crisis and changes in an international climate regime.

6.1.2 Trading in emission allowances

In the short term, the EU ETS has affected Statkraft's climate-related *trading* strategy, as the company's trading portfolio has been expanded to include carbon-related products.

> First of all, the introduction of a new system creates a completely new market for the trade in quotas, which Statkraft wants to take part in [...] Secondly, the quota system will influence price-setting in the energy market. […] Participation in the quota trade can provide understanding of such price formation. For that reason, Statkraft aims to become an actor in the quota-trade market from the very start (reported in *Fossekallen* 2004, no. 3:8)

The statement above shows that the EU ETS created a new market after 2005, and hence opportunities for Statkraft for trading in new power products (EUAs, CERs etc.). As we saw when discussing changes in Statkraft's climate strategy (section 5.3.3), the company has become increasingly active in trading on the continent since 2005, and is now an active player also in the carbon market. Statkraft has justified its trading activities in three main ways: 1) trading is an opportunity to make money, 2) trading means being close to the markets, making it easier to understand the different drivers for power-price developments, and 3) trading is a way of managing risk. Due to all these factors, Statkraft has become an active player in the carbon market.

With the evolution of the carbon trading market, not only the carbon spot market but also some derivative markets (like the carbon future markets, options market, and forward market) have gradually emerged. Statkraft has expanded its trading portfolio to include all these products. In 2007, 'trading with renewables and emission allowances contributed around half of the profits in the whole trading and origination segment', and 'from the beginning, trading with CO_2 emission allowances and related products has been a profitable business for Statkraft Markets GmbH' (Statkraft Markets GmbH 2007:24)[26].

Statkraft would have been active in Europe's power exchanges also in the absence of the EU ETS, but the trading scheme has provided opportunities for Statkraft to expand its trading portfolio – and hence diversify its expertise and increase profits (Interviews 2010).

6.1.3 Summing up the specific effects

We have seen how the introduction of the EU ETS has provided Statkraft with new opportunities, and very few risks. It impacted on the company in two main ways: 1) by affecting power-price levels and the relative costs of different technologies, and hence

[26] Trading consists of dealing in various standardized products in different European marketplaces, while origination comprises bilateral trading in non-standardized products.

revenues and the basis for investments; 2) by opening up for trading and origination in emission rights. In the period under study here, the EU ETS has led to increased revenues and an expansion of Statkraft's trading portfolio. The company has also in the short term started to integrate the costs of CO_2 into its investment decisions. The most interesting specific effect concerns Statkraft's long-term strategy of strengthening its position as Europe's leader in pure energy: expectations of a high and stable carbon price will support investments in (gas and) renewable energy. The changes in stringency in the EU ETS from the first to the second trading period have not had any significant impact on Statkraft's climate strategy, but the expected increase in stringency in the revised EU ETS from 2013 onwards (the trading scheme has no date of completion) is expected to present the company with opportunities and a firm basis for growth.

We find support for the first and second hypotheses, as anticipation of a more stringent and predictable EU ETS (and thus a higher and more stable carbon price) from 2013 has supported changes in climate strategy in an offensive – or even innovative – direction. On the more general level this can be explained with Steger's typology of strategies: under conditions of low environmental risk and extensive market opportunities, companies will tend to adopt an offensive strategy (Steger 1993).

6.2 EU ETS as part of a wider EU climate policy

The overall EU climate and energy policy is also expected to influence changes in Statkraft's climate strategy, especially if this policy is perceived as coherent and complementary (H3). As discussed in section 4.2, the EU endorsed several ambitious climate targets in 2007 (the '20–20–20' targets), and in 2008 it proposed an 'energy and climate package' to achieve the objectives of reducing GHG emissions and boosting renewable energies by 2020. Also before 2007, with the 2001 RES directive and the EU ETS, the EU had a climate policy in place, but this was non-binding. In this section we will see how different EU goals and policies have served as a unified and firm foundation for Statkraft's climate strategy – especially after 2007.

6.2.1 The 20–20–20 goals: A firm foundation for Statkraft's climate strategy

> The EU's new package of measures (including the so-called 202020 target) represents an impressive response to the threat of climate change. The EU is set to implement a dramatic energy policy course change which will have an impact on our individual way of life, on industry and on traffic. It also offers great opportunities, perhaps especially so to Norway […] In the future, clean energy will be another great export industry. To reach its 202020 goals Europe needs as much clean energy as it can lay its hands on, and Norway can supply more and more. Think about that the next time you grumble about the weather. **Wind and rain are the new oil**' [my emphasis] (Editorial in *Fossekallen,* 2008 no. 1:2)

The EU's climate policy has been a firm foundation for Statkraft's overall strategy, especially since 2007, when the stronger focus on Statkraft as a flexible and renewable producer with the 'solutions for tomorrow'. It is hard to isolate the effect of EU climate policy on these adjustments, as this policy is a part of a general, international increased climate awareness and action – represented not least by implementation of the Kyoto Protocol and the IPCC report from 2007. Several factors have contributed to making climate policy a topical issue. However, the EU has been the actor that – to the largest extent – has translated these goals into concrete action, with ambitious (and legally binding) goals (Interviews 2010). The EU's climate policy after 2007 has in many ways been 'a gift' to Statkraft, as it was in line with Statkraft's already expressed strategic priorities, highlighting the company's advantages within environmentally friendly and flexible power generation; and it enabled Statkraft to strengthen this strategy and aim 'even higher' (Interviews 2010). The EU's climate policy backed up both the strategy of being a flexible producer of hydropower and gas, and the emphasis on innovation and new renewables. The demand for flexible energy will increase under the EU 20–20–20 regime, as greater new renewable power production (wind, solar…) will result in a growing need for highly flexible power production capacity, since wind and sun are unstable sources of energy.

6.2.2 The Renewables Directive

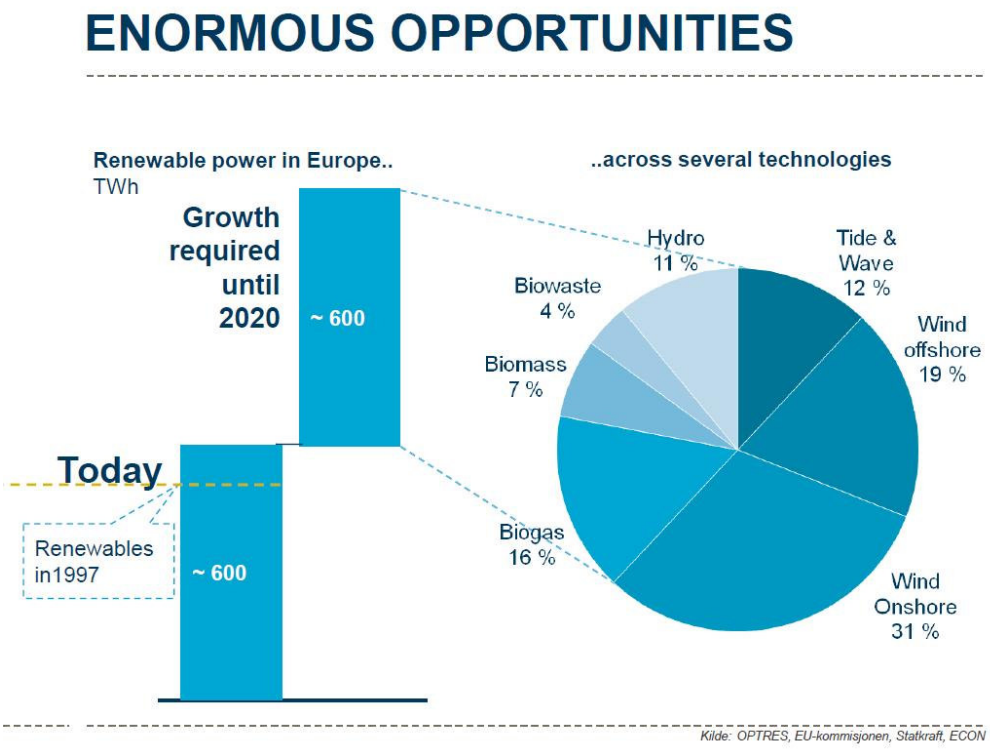
The message from CEO Bård Mikkelsen in Statkraft's 2007 Annual Report accentuates the opportunities that the EU's policy provides the company. The heading is 'Leading – in a Europe showing the way forward' (p. 8). The EU's 20–20–20 targets receive most attention here, with statements like: 'The EU's extremely ambitious energy and climate targets are inspiring, and at the same time, establish a firm strategic framework for Statkraft's activities', and 'This [the EU's policy] presents Statkraft with a wonderful opportunity for

growth'. Together with the revised ET Directive, the new *Renewables Directive* is also expected to have a major impact on Statkraft in the years to come. As explained in section 4.2.2, the directive establishes a binding target: 20% of energy consumption is to be generated from renewable sources by 2020. Statkraft's own calculations show that if the EU is to reach the target of 20% renewable energy, growth in generation must be doubled over the next 10 to 12 years, which means more than 600 TWh in new production (see, e.g., Annual Report 2008:34). Statkraft argues for a clear connection between the EU's renewable goals and the company's climate strategy:

> If the EU is to reach its target of a 20% renewable energy share by 2020, the required annual growth in renewable power generation has been estimated at around 50 TWh in the period 2010–2020. […] Statkraft has set ambitious targets for the development of wind power and hydropower in selected European countries (Statkraft Annual Report 2007:34).

The following figure (7) shows Statkraft's views on the need for renewable energy in Europe in the coming years:

Figure 7: Renewables growth required in Europe until 2020



(Source: Ulseth 2008)

Realization of these opportunities will, however, depend on national subsidy systems, as European power prices alone cannot make new renewable technologies profitable. I return to these support systems in chapter 7; suffice it here to say that the Renewables Directive has provided Statkraft with enormous opportunities for growth, both within old and new renewable energy technologies. The Directive is an important part of the backdrop of Statkraft's offensive long-term climate strategy. Other considerations and factors have been more central in relation to innovation efforts, and I return to this under section 8.2 (company level).

The complementarity of the EU ETS and the Renewables Directive in general is complex, as a large share of renewables introduced in the European power market will push carbon prices down (Böhringer and Rosendahl 2009). At this point, however, the two directives are considered complementary as regards Statkraft: they pull the company in the same direction (Interviews 2010). Both directives are concerned with making fossil-based energy sources less attractive and renewables more profitable, and that is in line with Statkraft's core competitive advantage and activities. Both directives may give Statkraft new opportunities. Other companies might not share this view of complementarity, but, as explained in section 2.2.3, my concern is with how *Statkraft* views the coherence of the various policy items. This means that hypothesis 3 is also supported in this analysis, as the EU's wider climate policy in total has provided Statkraft with a strong strategic foundation.

6.2.3 The climate policy as a EU energy market policy

An important contributing factor to the effect of EU climate policy on Statkraft's climate strategy is the EU's *energy* policy. The European energy markets have undergone great changes in the 2000s, with deregulation, consolidation, integration and increased competition (*Euractiv* 2009). The emergence of a common energy market in Europe and greater transmission capacity between countries has made Statkraft's role as a European swing producer more profitable. The company is now part of an international marked that needs more and more flexible power. The strategy of selling expensive flexible power in peak periods hinges on deregulation, with the climate policy creating the extra demand (Interviews 2010). The interaction between deregulation and climate policy will not be further explored here. Let me merely state that deregulated European energy markets are a precondition for

Statkraft's growth ambitions in both flexible and new renewable energy production – and a precondition for the developing carbon market.

6.3 Summing up the EU influence

The analysis in this chapter has supported our three first hypotheses: expectations of a more stringent and predictable EU ETS (H1 and H2), together with a complementary EU climate policy (H3), have influenced Statkraft to adopt a climate strategy at the pro-active end of the continuum. EU's climate and energy policy has been well-aligned with the competitive advantage already existing in Statkraft. Europe is opening up, making it possible for companies like Statkraft to expand into new markets. The 20–20–20 goals and the Renewables Directive brought a greater degree of predictability into Statkraft's framework conditions, and are likely to present opportunities for growth within new and old environmentally-friendly technologies in the years to come.

These new opportunities are an important part of the explanation of Statkraft's plans to invest between 80 and 100 billion NOK in environmentally-friendly energy up until 2015. The EU's climate policy works as nice 'background music', and as an additional driver for ambitious investment plans (Interviews 2010). Simply put, the EU becomes a confirming and facilitating factor, affirming that Statkraft is doing 'the right and the smart thing'. Some things are still uncertain, as it is hard to predict exactly how EU climate policy (and hence carbon price, support schemes and so on) will develop, but Statkraft has committed itself to a strategy adjusted to a Europe that is expected to require more flexible and renewable energy.

In discussing the second research question of this study ('To what extent and how can the EU ETS explain these changes [in Statkraft's climate strategy]?'), we have seen that even though the EU ETS and the EU are part of the explanation, also other factors must be addressed if we are to fully understand the changes in Statkraft's climate strategy. Why has Statkraft not used the opportunities provided by the EU to adopt an *innovative* climate strategy – in the short and the long term? Taking Statkraft's own statements about today's and the future's climate policy as a starting point, we can ask why the company has not moved even further up on the continuum. This question will be explored in the next two chapters, where we examine factors from the national and the company levels.

7. The national level

The EU ETS and the EU's wider climate policy are not the only drivers for changes in corporate climate strategies. Another alternative or complementary perspective is related to factors located at the national level. One type of influence is likely to be found in a company's home-base country, where it has its historical roots and headquarters. Another type of influence comes from the countries where a company operates.

In this chapter I take a closer look at whether and how Norwegian state policy, and policy from the countries in which Statkraft operates, can explain changes in the company's climate strategy. We have seen how factors from the EU level contributed to explaining why Statkraft's long-term climate strategy has been increasingly offensive in the period studied. Perhaps national-level factors can be part of the explanation for why its strategy has not been even *more* offensive, or even innovative, in the short and the long term. First, however, let me point out that Statkraft is affected by a whole range of policies and factors from the national level. It is difficult to make a selection, so I have decided to adopt a bottom–up approach, taking as my starting point the factors that Statkraft itself sees as the most important drivers for changes in climate strategy.

7.1 The influence of Norwegian policy

Statkraft is a 100% state-owned Norwegian company, and its history, headquarters and most of its activities are located in Norway. The Norwegian state influences Statkraft in two ways: as the company's sole owner, and as the regulative and legislative power in Norway. Recalling my hypotheses from chapter 2, we may expect that *the more supportive is Norwegian climate and energy policy targeted at the power sector, the higher will be the likelihood of changes in Statkraft's climate strategy in an innovative direction* (H4). I believe, with Skjærseth and Skodvin (2003:116), that 'a viable climate policy creates regulatory pressure, grants market opportunities and reduces uncertainty for companies with regard to future governmental priorities'. In this section we will therefore explore the supportiveness of Norwegian climate and energy policy targeted at the power sector, and see how this corresponds with the changes in climate strategy discussed in chapter 5.

7.1.1 The Norwegian state as a policy-maker

Putting a stop to hydropower development

Prime Minister Jens Stoltenberg's New Year's speech to the nation in 2001 signalled more stringent terms for hydropower development in Norway. Statkraft concluded that this would limit the number of new hydropower projects (Statkraft Annual Report 2000:11). Expansion was further limited in 2002 by the Competition Board *(Konkurransemyndighetene*) which protested against Statkraft's dominant position in Norway (Skjold 2009:204). In 2004, Christian Rynning-Tønnessen, Executive Vice President at the time, said to the Statkraft in-house magazine *Fossekallen* (no. 1:4):

> We are dependent on continued growth to create a strong, Norwegian-based company, and to be able to give out owners a sufficient return on their investments. In that *we can no longer grow much more in Norway*, it is natural for us to look to Europe [my emphasis].

In other words, Statkraft's strategy of European growth is partly a direct consequence of political realities in Norway, when, early in the 2000s, the company was denied access to new hydropower projects and purchases of shares in power companies in Norway. Expansion into nuclear or coal is not politically possible for Statkraft,[27] and gas power has been, and remains, controversial in Norway. While 'gas is green' in, for instance, Germany, that is not the case in Norway. The use of renewable energy sources, like as hydro and wind power, is far more popular with Norwegians than fossil energy production, even with CO_2 treatment (TNS Gallup 2009). In Germany, by contrast, electricity generation has been based largely on coal, oil and nuclear energy; compared to these, gas power is more efficient and generates less pollution. In Germany, the environmental movement greeted Statkraft's investments in gas-fired power plants with enthusiasm (see for instance *Adresseavisen* 2006).

With the Norwegian authorities sceptical towards both hydropower expansion and gas in the 2000s, Statkraft has had to direct its growth in flexible energy sources to countries in Europe

[27] A good example of Norwegian scepticism to Statkraft expanding into non-renewables is the so-called 'Sydkraft case'. Many politicians were disturbed when Statkraft became co-owner in Sydkraft, a major nuclear power producer in Sweden. It did not at all fit with the goal of making Norway a global leader in environmental policies (Skjold 2009: 232). Statkraft's new role caused strong political reactions, and several parties and politicians campaigned that Statkraft should get rid of its shares in Sydkraft by the end of the 1990s (ibid.). Statkraft was not relieved of its ownership of nuclear generation capacity before 2008, when E.ON. took over its shareholdings (Skjold 2009: 236).

and the rest of the world. But what about other forms of new renewable energy, like wind and ocean energy – could Statkraft go after such projects in Norway?

Renewable energy development in Norway

Judging by the rhetoric signals and ambitions set out by the Norwegian government in the 2000s, it seems reasonable to think that Statkraft had the possibility to invest offensively (or even innovatively) in new renewable energy in Norway in the period studied here. In a Report to the Storting in 1998, the Bondevik government stressed that new power generation had to be stepped up, and especially by using renewable sources of energy (Report No. 29 (1998–1999)). In 1999, the government declared that 3 TWh would be generated from wind by 2010. Norway's commitment to the climate change challenge and the need for more renewable energy has been reaffirmed by several different governments at numerous occasions in the 2000s. But has these objectives resulted in the establishment of actual incentives for the production of renewable energy? In the following, I will discuss the incentives planned and/or introduced to support the outspoken ambitions, in light of what Statkraft has considered as necessary support in the period studied.

Support for renewable energy

With the exception of some hydropower projects, European power prices are not sufficiently high to render new renewable technologies commercially viable. Some sort of support systems is therefore needed to secure growth within these technologies; a price on carbon is not enough. The Norwegian government established ENOVA in 2001 – a public agency for 'the promotion of environmentally friendly restructuring of energy consumption and generation in Norway' (ENOVA 2010). ENOVA has provided some investment support for the implementation of new energy technology, but it has been a challenge for this agency to develop good support schemes, to recruit good projects, and to avoid cancellations of renewable projects (Riis-Johansen 2010). In 2005, Statkraft wrote (Annual Report 2005:29): 'The opportunities for Norwegian players to contribute to the development of renewable energy resources in the future will depend on the framing and reliability of the financial incentive schemes'. Statkraft has on several occasions expressed the need for good support schemes, and that the level of support in Norway generally is too low (Statkraft Annual Report 2006:33).

Discussions on replacing the investment support given by Enova with a common green certificate market[28] with Sweden have been on the agenda several times in the 2000s. Sweden introduced a tradable green certificate support system in 2003, and the Norwegian authorities planned to establish such a market in 2007. Statkraft has always supported such efforts, with statements like: 'We are convinced that trading in green certificates is the most cost-efficient way of procuring new, renewable power' (Statkraft Annual Report 2005:7). However, after negotiations with the Swedish authorities, the Norwegian government announced in February 2006 that such a market could not be realized at that point in time. From Statkraft's point of view, '[…] the postponement of the establishment of a market of green certificates linked to renewable energy capacity in Norway is very unfortunate' (Statkraft Annual Report 2005:29), and 'The framework conditions for the construction of new wind power facilities are negatively affected by the fact that a market for green certificates in Norway cannot be realized at this point in time' (ibid.:48).

After the negotiations on a green certificates market had failed, the Norwegian government went back to proposals of more 'traditional' incentive schemes for the development of renewable energy. A new incentive scheme was presented in the autumn of 2006, planned to come into effect from 2008 (Report No. 11 (2006–2007)). This proposal said for instance that producers of wind power would receive NOK 80 per MWh of produced electricity over a period of 15 years. Statkraft's reacted to this proposal by writing: 'Statkraft considers the model itself to be good, but it is felt that the level of support is too low. With the current level of costs for developing wind power, it is difficult to see that many of Statkraft's current wind power projects can be realized with this level of support' (Statkraft Annual Report 2006:50). This support scheme was for that matter never realized (Riksrevisjonen 2009–2010:112).

The 'Agreement on Norway's climate policy' *(Klimaforliket*), was a multi-party response to the 2007 White Paper 'Norway's climate policy' (Report No. 34 (2006–2007); *Agreement on Norway's climate policy* 2008). This agreement states that Norway should be carbon neutral by 2030, and that Norway will voluntary strengthen its Kyoto commitment by 10 percentage

[28] A key feature of a green certificates scheme is that producers of renewable energy receive certificates from the authorities, proportional to their output. What is defined as "renewable" varies from certificate scheme to certificate scheme. The users of electricity are required to buy a certain amount of these certificates, and so the purpose of the scheme is to get more renewable electric energy into the market at the expense of traditional energy (Bye and Hoel 2009).

points. The agreement also includes a request for a re-opening of negotiations in respect of a Norwegian–Swedish certificate market – partly due to the anticipated increase in demand for renewables that will follow the implementation of the EU Renewables Directive.

Effects of the Norwegian renewable policies

In their book from 2003, Skjærseth and Skodvin (2003:131) write:

> Renewable energy (in addition to hydroelectric power) such as wave, wind, solar and bioenergy has never been high on the political agenda in Norway. […] In contrast to many other European countries, such as the Netherlands, incentive-based instruments to increase the use of renewable energy have been used only to a limited degree in Norway.

This statement can be said to be relevant also after 2003, as several accounts claim that little has been done to promote new renewable energy in Norway in the period studied in this thesis. The uncertainty surrounding a common Swedish–Norwegian certificate market has in particular been a heavy burden on the power sector (Riksrevisjonen 2009–2010:101). The Office of the Auditor General of Norway issued a report on goal achievement in Norwegian climate policy, expressing concern as to the uncertainty and low ambitiousness of support to renewable energy:

> Our review shows that uncertainty about support arrangements and lack of profitability in projects have resulted in planned projects not being implemented. […] the producers of renewable energy have had unpredictable framework conditions. As of the end of 2008, wind-power installations had been completed that represented an annual production of approximately *one* TWh (Riksrevisjonen 2009–2010:15).

Based on this, together with Statkraft's view on Norwegian policy as presented above, we may conclude that Norway's policy approach to promoting renewable energy has been not been supportive enough to attract new investments on a large scale thus far. True, Statkraft adopted an increasingly offensive climate strategy in the period 2003–2009 – but usually as long-term plans, and mainly for markets outside Norway. In part, this can be explained by the lack of sufficient state support in that period, leading to a general delay in phasing in new renewable capacity in Norway.

We now turn to the Norwegian state as Statkraft's owner, to see what sort of conditions this ownership has contributed for changes in the company's climate strategy.

7.1.2 The Norwegian state as owner of Statkraft

As set out in 2003–2004, Statkraft is to be managed solely according to business criteria (St.prp. 53). It cannot invest in environmentally useful projects that lack a sound commercial basis (Skjold 2009:16). However, on several occasions the Norwegian state has expressed the importance of Statkraft contributing to the development of renewable sources of energy. Report no. 13 (2006–2007) to the Storting, on company ownership, argues for instance that Statkraft shall be a European leader in environment-friendly, as this will help strengthen Norway's position as an energy nation.

At this point of intersection – a state-owned company run on a commercial basis – several interesting questions arise. Is state management inevitably less innovative than private? Have different Norwegian governments with different ideological affiliations affected Statkraft's (climate) strategy in different ways? What opportunities does the state actually have to exert political influence over Statkraft's business? All these topics merit studies of their own, and cannot be addressed within the limits of this brief thesis. Let me draw attention to one aspect of state ownership of Statkraft: the dividends policy. This is singled out in line with the bottom–up approach chosen for this thesis – I focus on factors held by Statkraft itself (in written materials or in interviews) to be decisive for understanding drivers and barriers as regards the development of its climate strategy.

It is relatively safe to conclude that the dividends policy of the Norwegian state has *not* been in line with Statkraft's own growth ambitions in recent years. According to Skjold (2009:200), 'from around 2000 onwards, the state has gained a great deal of from Statkraft's rising profits. Dividend rates of 75% have been quite common, and in some years, the state's share has been well over 95%'. This policy has caused a great deal of frustration in the company, and in the Annual Report from 2002 CEO Bård Mikkelsen writes: 'When the Government, as our owner, withdraws 95% of Statkraft's net income for the year in dividends, this affects our ability to realise profitable and environmentally friendly projects.' According to the 2004 Annual Report (p. 18) :

> The dividend requirement remains extremely high this year. The board is worried that the unpredictable dividend policy and the high level of dividend required contribute to uncertainty regarding the framework conditions for the group's planning and business management.

In 2009, the Statkraft board recommended that the Norwegian government should strengthen the company's equity by NOK 8 billion and amend its current dividends policy (Statkraft 2009b). This should enable implementation of Statkraft's ambitious strategy for a NOK 80–100 billion investment in environmentally-friendly and flexible power production (see section 5.1.2). By the end of 2009 (the close of the period studied here), the Norwegian state had still not responded to this enquiry.[29] It lies beyond the framework of this thesis to investigate *why* the Norwegian dividend policy has been shaped like this – except for the obvious reason of Statkraft being a revenue-generating machine and hence a valuable contributor to the Norwegian state budget[30]. Suffice it to say that this policy has led to frustration in Statkraft. Many hold that, with a different dividends policy, Statkraft could have achieved more and been a more offensive energy company (Interviews 2010). On the other hand, there is also reason to believe that there would be internal disagreement in Statkraft related to how and where any extra resources should be spent – should Statkraft go into new technologies and prioritizes innovation, or should the company continue with 'what it already knows' (meaning hydropower). I return to this dimension in the next chapter, in discussing the various views on Statkraft's identity (see section 8.2).

7.2 The national level – outside Norway

There might be common EU goals for increasing the share of renewable energy, but it is up to each individual country to decide what incentive schemes to establish for this purpose. The Renewables Directive also introduces differentiated national targets for each member state. As a result, incentives vary widely among countries and among different technologies.

Above we have seen how Norwegian regulations and state ownership have affected Statkraft's climate strategy in the past decade. Let us now turn to the effects of the national policies of *other* states. Following the gradual deregulation of the European energy markets,

[29] Statkraft did however receive a reply in December 2010; this will be commented upon in the epilogue.

[30] According to Skjold (2009:201), the handling of Statkraft's profits appears to be in complete contradiction to the general guidance on dividend policy, referring to a 1997 White Paper/Report to the Storting on state ownership, according to which companies 'with good access to profitable investment projects and whose growth prospects are promising' should be 'subject to only to moderate dividends demands'. According to Skjold, Statkraft belongs to this category of companies, but the state's dividends demands have not been moderated.

Statkraft has become an increasingly international company. As discussed in chapter 5, a large part of Statkraft's climate strategy is planned for, and has been implemented outside Norway. There have been investments (and plans) in gas- and wind-power production in countries like Germany and the United Kingdom. Surely there must be something about conditions in these countries that can explain why Statkraft has decided to go in for projects there. Countries with feed-in tariffs[31] or other support schemes have been particularly successful in building up an innovative industry for renewable energies (Jänicke and Lindemann 2010:132).

Recalling the hypothesis from chapter 2, I assume that: *The more ambitious the support schemes in other European countries targeted at the power sector, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction* (H5). This topic will be discussed by examining the development of one particular aspect of Statkraft's climate strategy: its wind-power engagement.

7.2.1 The case of wind power

To find the explanations for Statkraft's investments in wind power (the Hitra, Smøla and Kjøllefjord wind farms in Norway, see section 5.3.2) we must examine the support schemes of other European countries. In 2002, Statkraft concluded that '[…] the wind power investments are made profitable because trading in green certificates is being stimulated by an increasing number of European countries' (Statkraft Annual Report 2002:15). Statkraft entered an agreement with the Dutch company Nuon in 2002, which wanted to buy green certificates. This agreement secured the profitability of the wind-power projects at Hitra and Smøla *(Fossekallen* 2002, no. 5).

In 2006, Statkraft decided to intensify its work in establishing a wind portfolio in the United Kingdom, based on the following argument: 'There is a limited potential for wind power developments in Norway under the existing incentives scheme, and Statkraft has therefore chosen to invest in wind power in the UK, where the regulatory framework is highly attractive' (Statkraft Annual Report 2006:21). In 2007 Statkraft was granted its first wind-

[31] Feed-in tariffs are a policy mechanism for encouraging investments in renewables. Essentially, they involve a premium rate paid for clean energy generation, e.g. from wind turbines.

power licence outside Norway, in the UK, and Ingelise Arntsen, Executive Vice President at the time, said the following in the press release: 'There are two fundamental reasons for us investing so heavily in wind power in the UK. There are good wind conditions here and also the best financial incentive schemes in Northern Europe today' (Statkraft 2007). In this connection, Statkraft's Knut Fjerdingstad also seized the opportunity to criticize the Norwegian support systems for wind and renewable energy:

> We want to become the largest in Europe as regards environmentally-friendly energy […] – We intend to emphasize projects abroad because it is difficult to find profitable projects in Norway. The framework conditions are simply better in Europe […] In Norway we receive 8 *øre* per kilowatt hour in support for wind power. In the UK, we receive about 50 *øre* per kilowatt hour through support arrangements *(Teknisk Ukeblad* 2007).

Summing up, we can see that the level of support (and hence project profitability) is a determining factor when Statkraft decides where and how to invest in wind power. The discussion gives support to our hypothesis (H5), in that ambitious support schemes in other European countries have contributed to Statkraft's climate strategy becoming increasingly offensive in the 2000s. These support schemes have been established due to many reasons – improved security of supply, improved employment prospects, and – last but not least – because of the EU's Renewable Directive and the transition to a low-carbon economy. The renewables targets have a great impact on national energy policies, as the share of renewables must increase considerably in the years to come. The support schemes are also working alongside the EU ETS, as government support is essential to spurring innovation and abatement efforts in the power sector.

7.2.2 Statkraft and a common European support system

As an extension of the above conclusion on the effect of national support schemes, we may note that Statkraft has advocated the introduction of common European support system. A total of 30 different renewable energy support systems are currently in operation around the continent (Statkraft Annual Report 2008:33), and Statkraft holds that a common system for support, or at least a greater degree of harmonization, would be more appropriate and lead to more renewable energy at lower cost in Europe. (See e.g. Statkraft Annual Report 2006:33.) In 2007, the Statkraft Group presented a proposal on a European green certificate market to the EU Commission, saying that this type of common market would 'limit the burden on the environment and ensure that the most cost-effective projects are realized first, regardless of

geographical location and the type of technology that is used' (Statkraft Annual Report 2007:51).

7.3 Summing up the national influence

According to the second explanatory perspective applied in this study, key sources of company behaviour can be found at the domestic political level. This chapter has argued that the renewables and dividends policies of the Norwegian state have had a moderating effect of Statkraft's strategy in the short term. While Norwegian attitudes towards new hydropower and gas power, together with the Competition Board's views on Statkraft's size in Norway, have worked to stimulate changes in strategy in Statkraft (in terms of technologies as well as geography), Norwegian state policy on renewables has made it more difficult for Statkraft to adopt a pro-active climate strategy in the short term. Norway has lacked a good support system or a market for green certificates, and, together with a strict dividends policy, this has been an obstacle to offensive development in Statkraft.

This finding supports hypothesis 4 in this thesis. Also hypothesis 5 finds support in the discussion of support schemes for wind energy in other European countries. Statkraft is run on a commercial basis, and needs sufficient support to go in for new, renewable technologies. Finally, we note that there is a link from EU renewables policy, via national support schemes, to changes in Statkraft's climate strategy. This chapter is hence to some extent a continuation of the previous chapter, as it calls attention to some of the indirect consequences of EU policy.

Despite Norway's lenient policies on ownership and renewables in the short term, the EU's climate policy together with the prospects of a more offensive Norwegian climate policy in the future (cf. *Agreement on Norway's climate policy*), makes it relevant to ask why Statkraft's *long-term* strategy is 'merely' offensive – and not innovative. Here I will draw on a third perspective, and look for explanations inside Statkraft itself. What sort of climate strategy does the company want to pursue? How has Statkraft dealt with the framework conditions set by the EU, Norway and other European states discussed thus far?

8. The company level

The previous chapters showed that while the EU's climate policy, together with support schemes in several European countries, have had a confirming and reinforcing influence on Statkraft's offensive climate strategy, Norway's policies on ownership and renewables have had a moderating effect on this strategy. In this chapter I explore the explanatory power of the corporate level. The overall aim here is to understand why Statkraft's short- and long-term strategies have become increasingly 'offensive', but cannot yet be considered 'innovative'. The two previous perspectives focused on external drivers for change in climate strategy, while this chapter examines the determining factors within the company itself.

As explained in section 2.2.5, I have chosen to focus on one main factor: Statkraft's identity. I assumed that *the more Statkraft can be characterized as a company with an innovative identity prior to and during the period studied here, the higher the likelihood of changes in Statkraft's climate strategy in an innovative direction* (H6). A company that identifies with innovative solutions is more likely to react pro-actively to climate regulations than a company without such an identity. Section 8.2 explores different views of company identity within Statkraft, to see what opinions have prevailed regarding Statkraft's role as an innovator.

First, however, I begin (section 8.1) with a glance at the company's history, showing how the choice of (at least) an offensive climate strategy in the 2000s represents a natural continuation of the company's past. Path-dependent factors internal to the company can to a large extent explain the changes in Statkraft's climate strategy in the 2000s, i.e. what there has been for the EU to reinforce and Norway to moderate. This chapter builds directly on the historical account given in the background chapter (Ch. 4).

8.1 Statkraft's history

8.1.1 An active participant in deregulated markets

As shown in the background chapter (section 4.3), Statkraft is a company with deep historical roots. Statkraft as we know it today was established in 1992, when the old Statkraft was divided into two state-owned enterprises: Statkraft SF for power generation, and Statnett SF for the national distribution grid. This followed the adoption of the Energy Act in 1991, whereby Norway became one of the first countries in Europe to deregulate its electricity markets.

The new state enterprise Statkraft had a hard time adjusting to the new, liberalized reality. During the first half of the 1990s, Statkraft was affected by large power surpluses and low prices, which meant economic problems for the company (Skjold 2009:179). Statkraft experienced heavy deficits between 1992 and 1994, a period characterized by a lot of hard work to get back in economic balance. There was not much room for offensive and innovative investments and acquisitions (Nilsen and Thue 2006:307). In the early 1990s, Statkraft prioritized bilateral long-term power contracts and turned its back on the new marketplace (Skjold 2009:170). However, when Statnett spot prices rose in 1994, Statkraft directed its attention to this new market, seeing it as strategically interesting (Nilsen and Thue 2006:321). As long as spot prices were higher than fixed-contract prices, Statkraft would lose money, so the spot market gradually assumed a more central position in the company's sales strategy (Skjold 2009:175). Statkraft also learned to use its competitive advantage in the organized market – the ability to predict supply and demand, and adjust production in line with those expectations (Skjold 2009:176). Statkraft used its hydrological, technical and economic expertise to make considerable profits on the power exchange. Skjold (2009:178) sees Statkraft's success in the in the new market, and later at Nord Pool, in relation to the company's historical areas of expertise:

> To summarise: when Statkraft entered the marketplace, it could capitalise to a great extent on in-house assets: its production plant and its wide-ranging technical skills, developed during its period as an administrative department while working under quite different conditions and regulatory frameworks.

Statkraft's trading and market skills were further developed when the company established trading offices in Germany and the Netherlands in 1999. These offices have been active in

trading and origination in the Continental power and gas markets and the UK's gas market (Statkraft Annual Report 2003:27). By being an active participant on the trading floors in Europe, Statkraft could gain valuable knowledge of new markets. Relating this development in the 1990s to Statkraft's climate strategy in the 2000s, it becomes apparent that Statkraft has been an active participant in liberalized power markets for over 15 years, and has extensive experience in transborder European business. The historical competences and experience with trading and price analyses that Statkraft had developed over more than 30 years, from Samkjøringen to Nord Pool, were to prove extremely valuable when the company earnestly entered the European markets in the 2000s.

8.1.2 Competitive advantage of flexibility

Statkraft's expertise in market analysis and trading is considered the company's core competitive advantage, together with its solid experience from production, maintenance planning and optimization of flexible power plants (Interviews 2010). These two advantages are closely interlinked, and have been developed in a path-dependent series of steps in recent decades. The strategy of being a flexible producer (maximizing income by strategic use of the flexibility of the hydropower plants in Norway and gas plants in Germany, and running these when prices in Europe are at their highest) requires extensive knowledge of the markets. Such first-hand information is best obtained through ownership of production units, which gives immediate access to the national trading floors (Skjold 2009:238).

To get the best out of Statkraft's unique production asset in the Nordic countries, one solution became to get involved in gas power on the Continent. That would also be a natural continuation of the company's early trade in gas, as Statkraft had amassed valuable knowledge of the gas markets and the Continental power market. Statkraft wanted to extend its possibilities to operate as a swing producer; and, with hydropower concessions in Europe limited, gas power became a natural and profitable choice (Interviews 2010). The company wanted to transfer the expertise gained from its hydropower engagement to the gas- power market. Thus, there were many reasons for going into gas power, and Statkraft had begun planning this development many years before the introduction of the EU ETS (Interviews 2010). All in all, Statkraft has one of the most flexible generation and reservoir capacities in

Europe, and a central part of the company's identity is to be the peak supplier to Europe (Interviews 2010).

8.1.3 Summing up

Statkraft's climate strategy in the 2000s builds on 100 years of experience with hydropower, and 15 years with liberalized markets. The company's increased interest in flexible energy sources in Europe in the 2000s is thus a natural continuation of its historical competitive advantages and strategic aims. 'To become one of the leading energy companies in Northern Europe with cutting-edge competence in the field of hydropower' – that has been the vision since the early 1990s. Even if this vision has now been expanded somewhat broadened in terms of technologies and geography ('to be a European leader in environment-friendly energy'), the main message stays the same. Of course it is convenient for Statkraft that this strategy should fit in so well with a Europe in the process of deregulation and increasing demands for climate-friendly energy and balancing power, but much indicates that Statkraft would have sought to become a swing producer based on hydropower and gas in any case. This discussion has also been essential in showing why Statkraft entered the CO_2 markets and why its price-analysis team became aware of the effects of the carbon price early (see section 5.3.3); it lies in Statkraft's historical identity to be an early mover when it comes to trade and obtaining market information.

8.2 An innovative identity?

Statkraft is first and foremost a *user* of technology, and to a lesser extent a provider. The company is interested in contributing to innovation of new technologies, but discussions continue within the company as to the degree (and type) of commitment (Interviews 2010). As the previous section showed, Statkraft's offensive climate strategy is largely a natural continuation of the company's history and traditional competitive advantages. The emphasis on hydropower, gas, market optimization and trade remains central to the company also today.

It can, however, be argued that Statkraft could have chosen to go into a broader spectrum of new renewable technologies, directing its investments towards more innovation and R&D. In

line with the hypothesis from section 2.2.5, I expect that a previous and current 'identity of innovation' is likely to result in an innovative climate strategy, as it will affect the company's desire and ability to utilize the opportunities presented by, for instance, EU climate policy. Recalling the definition of 'innovation' used in this thesis, we can see this is related to R&D in low- and zero-carbon power generation technologies that are *new to the company.*

A doctoral study by Per Ove Eikeland (forthcoming) on environmental innovation in Nordic energy systems concludes that Statkraft was a laggard in environmental innovation throughout the 1990s. In the 1990s, Eikeland concludes that 'Statkraft […] pursued a stable specialization strategy with highly restricted diversification of business activities, which restricted the diversity of its resources, technological and marketing capabilities' (Eikeland, forthcoming). From his comparative study of Statkraft and the Swedish company Vattenfall, he concludes that Vattenfall has responded differently and become more broadly environmentally innovative than its Norwegian counterpart (ibid.). My studies confirm this picture of Statkraft in the 1990s, as innovation initiatives seem to have been random and few, prior to 2006 (Interviews 2010, see section 5.4.1). Greater emphasis was put on innovation from 2006 onwards, but already from 2008 it was decided that innovation efforts should be concentrated around improving existing competences. Much indicates that this is related to internal discussions in Statkraft on *what the company should be.* There will always be a trade-off between 'further exploring new technological possibilities and more fully exploiting existing ones' (Pinkse and Kolk 2010:265). Companies face the dilemma of whether to search for new solutions and technologies that still require huge amounts of R&D, or to up-scale existing technologies that have already proven themselves (ibid.) Should Statkraft cultivate its profile as a company with cutting-edge expertise in flexible power generation and market operations – or should it go after greater diversity in technologies by focusing more on innovation?

8.2.1 The 'flexible' identity

We may speak of two main views on what Statkraft's 'essence' or core identity is and should be, and hence of innovation and diversification in the company. Both a 'flexible' and an 'innovative' identity are evident – the former referring to a focus on flexible power generation, old renewables and trading, and the latter being concerned with innovation, and

R&D on new climate-related technologies. The 'flexible' line of thought emphasizes Statkraft's core competences and historical identity – market analysis, optimizing of flexible power plants and energy trading.

Several pieces of evidence in this thesis have indicated this as the predominant way of thinking in Statkraft. The company has its competitive advantage in specializing in flexible power generation and trading, and seems logical to want to cultivate and expand this advantage further – not least because it is highly relevant and advantageous in a European market where more wind power and other non-flexible power production increase the need for flexible production capacity. Proponents of this view build on Statkraft's inheritance and historical identity (as shown in section 8.1) as well as the overwhelmingly majority of the assets in the company. On the other hand, this strand of thinking is also diversified – as one part of it is closely connected to Statkraft's identity as an administrative unit, a manager of Norway's hydropower resources; while the other is more attuned to trading and the liberalized market (Interviews 2010). The group that thinks Statkraft's essence is 'administrative' builds on an understanding of Statkraft as a world leader in *hydropower*, questioning why the company should get involved in anything else. This group is also concerned with innovation, but not in the sense of R&D in new and unproven technologies – they think innovation should be done gradually and in small steps, and related to, for instance, gradual improvements in hydropower plants. Representatives of this approach have been sceptical to the 'big leaps' presented by the company's innovation department, preferring more incremental innovation related to existing technologies instead (Interviews 2010).

8.2.2 The 'innovative' identity

Another way of thinking has gained strength in Statkraft in the 2000s, as one group has tried to link Statkraft's (current and future) essence more closely to innovation and technological diversification. This group has representatives throughout the entire organization, but is mainly concentrated around the innovation unit established in 2006 (Interviews 2010). These new ideas have to some extent also been spurred and supported by the more market-oriented groups in Statkraft, who have seen innovation efforts run on a commercial basis as a way of increasing future market shares (Interviews 2010). As we have seen, innovation has received

more attention, especially after 2006, and this is partly rooted in a discussion of what being a European leader in environmentally-friendly energy actually means. In 2007, this question was posed to Siri Hatlen, executive vice-president for 'New Energy' in Statkraft at the time:

> That is a good question, and I don't think Statkraft has finished discussing the full extent of our vision. You can choose to measure being a leader in terms of the number of TWh, but I think this provides a very incomplete picture. To be a leader you also have to 'lead the way'. This would involve Statkraft being one of those who take the lead, who have the courage to be visionary and ambitious in a way no one has managed before. *(Fossekallen* 2007, no. 4:21)

She mentions the company's ocean programme and the osmosis project as examples of areas where Statkraft could lead the way, and, as head of the New Energy unit she claims to be working on delivering Statkraft's core business for the future. Another good example of this way of thinking is the former mentioned '101 solutions' project developed with Bellona prior to the 2009 Copenhagen conference. This project statement is representative of a way of thinking that became increasingly evident in Statkraft in the 2000s: the company should exploit new market opportunities, and take larger steps in an innovative direction. CEO Bård Mikkelsen wrote the following in *People and Power* (2009, no. 4) prior to the Copenhagen conference:

> One of the most important issues will be finding new methods to cover the world's need for energy. Statkraft's vision is to *contribute to meeting this need* by delivering cleaner energy [my emphasis]. This is why we recently opened the world's first osmotic power plant prototype at Tofte in Norway. We know that this form of energy production can contribute to greener energy all over the world, and we hope to commercialise the technology within the next few years.

The company's 'innovative' identity has been constructed on the basis of essential contributions from individuals – from the innovation department itself, from the management in Statkraft (with CEO Bård Mikkelsen as a 'friend' of innovation), and from representatives of the market-oriented groups in Statkraft. Innovation efforts have been justified both as a way of seizing new market opportunities, and by pointing to Statkraft's responsibility for providing the world with cleaner energy (Interviews 2010). One of the dividing lines in the internal debate on corporate social responsibility (CSR) in Statkraft relates to the company's role as an innovator. While some believe that Statkraft's CSR mainly is about safe and low-risk management of Norwegian taxpayers' money, others hold that Statkraft has a responsibility to go a bit further – take some risks, and contribute more to the innovative solutions of tomorrow (Interviews 2010).

8.2.3 Statkraft's identity in the period studied

It seems reasonable to conclude that even though innovation and diversification have received more attention in Statkraft during the past half-decade, there can be no doubt that the traditional view of Statkraft as an administrator of hydropower resources has remained dominant. There is discussion in Statkraft related to whether it is strategically smart to build on existing competitive advantage, or whether one should exploit new market opportunities and go after first-mover positions. Of course it is possible to find a middle way (as the company to some extent has done), but, in line with Eikeland's findings from the 1990s, I would say that Statkraft has continued to focus on *specialization* within flexible power production also in the 2000s.

Statkraft as an organization was not quite ready for its new innovation department in 2006; many groups did not understand why establishing such a unit was at all necessary (Interviews 2010). There will always be a fight for money and resources within an organization. Innovation seemed a risky way of spending them, and that led to legitimacy problems for the innovation unit (ibid.) Thus, Statkraft did not have an identity of innovation prior to the period studied here, nor has it really developed one in recent years. Hypothesis 6 of this thesis can be supported, as Statkraft's placement on the continuum as offensive, but not yet innovative, is due partly to internal views on company identity and essence.

Innovation as an asset providing good reputation

Before summing up the findings of this chapter, I would like to briefly explore an alternative explanation to Statkraft's greater focus on innovation since 2006. Innovation has been increasingly prioritized not only because the company wishes to contribute to climate solutions a low-carbon energy system. Innovation is also recognized as an asset with good effects on reputation and recruitment – these justifications for innovation have been supported by several 'camps' in Statkraft (Interviews 2010). As senior vice-president for innovation Sverre Gotaas said to *Fossekallen* in 2006 (no. 3:7): 'It is also important to be perceived as an innovative company, not least with respect to recruitment'.

As shown earlier (section 5.1.2) Statkraft's reputation was low in the early 2000s. The CEO and others wanted to change public opinion about the company, and also raise the morale of those working in Statkraft. That would in turn help to attract a skilled workforce. Statkraft

decided to aim for '… a reputation on a par with the foremost big companies of Norway' (Brende 2010), and the company started to use its production of pure energy and its innovation efforts actively in the work on creating a new image, or brand. The various PR campaigns sought to portray Statkraft as an innovative company, and these efforts got results:

> Since work began on building an image or 'brand' in 2007, Statkraft has climbed 89th place, to 60th last year, and now to 38th in 2009 [on Synovate's major reputation survey 'Large Norwegian Enterprises'] […] According to Synovate, part of the explanation lies in the big campaigns in the mass media, emphasizing our involvement in the production of renewable, clean energy. Another reason is that the public reacts positively to such messages, due to the growing awareness of climate changes. Statkraft has shown the greatest improvement of all companies [in the ranking] *(People and Power* 2009, no 4:19)

There has, however, been some internal disagreement on the extent to which innovation should be 'used' so extensively in the company's communications strategy. While some forces in Statkraft seem to have viewed innovation as an asset only to the extent it provides the company with a good reputation, others have expressed the view that marketing campaigns may have gone a bit 'too far' (Interviews 2010). According to some respondents, the extensive focus on innovation in PR campaigns, annual reports and so on could sometimes be misleading and give a wrong impression of what Statkraft is actually doing, while under-communicating that Statkraft is still to an overwhelmingly extent a hydropower producer (Interviews 2010).

8.3 Summing up the internal influence

The increased focus on clean energy in the EU, at the national level, in the general public and by other stakeholders has been 'a gift' to a company with a portfolio based mainly on hydropower. Emphasis on the issue of climate change has been in Statkraft's self-interest and its greater focus on flexible and renewable energy production in the 2000s, and has been well-aligned with the company's history and competitive advantages. It is evident that external regulations (especially the EU) have created an extra impetus and a new drive for Statkraft – and the company has sought to seize these new opportunities.

This chapter has, however, also showed the internal disagreement related to *how far* Statkraft should go. Should it prioritize the historical competitive advantage of flexible power and develop its position as a European swing producer? Or should it focus on new forms of

renewable energy? The company has tried to do both in the 2000s, advancing its position in both respects. An 'innovative' identity has gradually matured alongside the traditional one, focusing on Statkraft's possibilities to contribute to the development of new climate-related technologies. This is apparent in the company's long-term strategy, where wind power, solar power and other technologies are accorded for attention. All the same, there can be no doubt as to Statkraft's top priorities – hydropower (and gas) are still the company's most important assets. Innovation is also considered an asset, but perhaps more as a part of the company's communications and recruitment strategy than due to any sincere wish for portfolio diversification. Statkraft is still a company with a 'flexible' identity – its essence is to be Europe's peak supplier and a world leader in hydropower production.

Finally, in the context of the wider topic of this thesis, we should note that external regulations, like the EU ETS or the Renewables Directive, can be used to strengthen or weaken different 'camps' within a company. While the EU's demand for clean energy can be an argument for strengthening Statkraft as a peak supplier (meaning that investments should be directed towards hydropower and gas), it can also be used to justify investments in new renewable energy, as a greater variety of technologies will be needed in Europe in the future. The policy has not excluded any of the strategic options under discussion in Statkraft, and both 'camps' within the company make reference to EU climate policy to underscore their arguments (Interviews 2010).

9. Concluding remarks

This thesis has examined the effects of the EU's Emissions Trading Scheme on the Norwegian power company Statkraft. In order to do so, I posed the following research questions: *Has Statkraft's climate strategy changed in the period 2003–2009? If so, how? To what extent and how has the EU ETS influenced these changes?* I have sought to identify the key conditions that determine the climate strategy of a power producer, systemized at three levels: the EU, national and company levels. In this chapter, I will recapitulate the analytical framework applied, before summing up the empirical findings and their implications for analysis and further research.

9.1 The analytical approach

The explanatory focus in this thesis has been changes in Statkraft's climate strategy in the period 2003–2009. I have based my assessment of these changes on a continuum from 'defensive' to 'innovative', signalling a gradual increase in climate-friendly commitment and activities. I have mapped Statkraft's placement on this continuum on the basis of four indicators: climate-related changes in 1) overall corporate vision and strategy, 2) organization, 3) investments, and 3) innovation and R&D. To explain changes in climate strategy, three perspectives were developed based on the multi-level governance approach and Steger's (1993) typology of environmental strategies. Factors from the EU, national, and company levels were expected to influence climate strategies through mechanisms of risks and opportunities, with degree of opportunities regarded as especially relevant in the Statkraft case – as the company has a portfolio based mainly on renewable energy. The EU level was expected to present Statkraft with many opportunities to the extent the trading scheme and other regulations are sufficiently stringent, predictable and complementary. This perspective was based mainly on the 'Porter hypothesis' (Porter and van der Linde 1995a, 1995b). Secondly, under the national perspective, supportive and ambitious national policies were expected to create opportunities and hence climate-strategy changes tending in an innovative direction. Finally, the company level postulated that opportunities are utilized, shaped and created by factors within the company in question. This perspective was mainly built on the theory of 'organizational essence' (Halperin et al. 1974).

9.2 Main empirical findings

In chapter 5, Statkraft's climate strategy in the period under study was assessed according to the four indicators. I found that Statkraft's climate strategy has changed, becoming increasingly 'offensive'. In the short term, the company has strengthened its overall commitment as a producer of flexible and renewable energy sources, investing in hydropower, wind power and gas power. New growth initiatives were emphasized with the reorganization of 2008; and innovation efforts have been stepped up somewhat, especially after 2006. Statkraft's applied strategy in the period 2003–2009 has become increasingly 'offensive', but not been pro-active enough to be called 'innovative' in the categorization applied in this thesis. This is due mainly to the combination of three factors[32]: 1) the company has added non-renewable sources of energy to its portfolio (gas power), 2) its innovation efforts have been modest compared to its core activities, and 3) the main focus is still on 'old' renewable energy (hydropower), and efforts to diversify the company portfolio seem rather half-hearted.

As to the longer term, Statkraft's strategy for the period 2009-2015 presents an ambitious programme for growth in clean energy, with planned investments of between NOK 80 and 100 billion. The strategy signals greater emphasis on innovation, with R&D work within new energy technologies such as osmotic power, offshore wind power, wave and tidal power. It appear that Statkraft is aiming to move further up on the continuum in the direction of what this study has termed an 'innovative' climate strategy in the future. These plans are an important reason why Statkraft's climate strategy can be categorized as *increasingly* offensive, but not yet 'innovative', in the period 2003–2009.

Chapter 6 looked at the explanatory power of factors stemming from the EU level. In general, support was found for the hypotheses of this perspective, as anticipation of a more stringent (H1) and predictable (H2) EU ETS in the near future, together with views of a coherent EU climate policy (H3), contributes to explaining why Statkraft changed its climate strategy in an innovative direction. The anticipation of a stronger carbon market towards the year 2020 threatens companies with fossil-based portfolios, as a high carbon price carbon

[32] Cf. table 1 in chapter 2, highlighting differences between an 'offensive' and an 'innovative' climate strategy.

increases the marginal costs of production. In order to comply with the scheme, such companies will be dependent on abatement, or purchasing allowances. Statkraft, by contrast, is likely to profit from a stringent carbon market, as it can provides companies with competence in renewables with new opportunities for increased revenues (from both the pass-through of the CO_2 price to the electricity price, and from trading in emissions allowances and related products) and growth (as investments in renewables are likely to be more profitable). Thus far, the EU ETS has worked as a fuel-switch mechanism between coal and gas, with minimal threat to Statkraft's gas-power involvement. The company has already started to integrated costs for CO_2 in investment decisions, and the carbon price is an important element in Statkraft's scenarios for the future. All in all, the EU ETS has provided Statkraft with some opportunities and benefits on the short term, but the greatest impact is expected to come with the beginning of phase III in 2013 and onwards – when the scheme will become more stringent and the carbon price is likely to be higher. Also other studies have shown that the steering role of the EU ETS in promoting renewable energy and low-carbon development has remained limited thus far, but that this could change in the future (see e.g. Hoffmann 2007; Zhang and Wei 2010).

The EU's wider climate and energy policy and the 20–20–20 goals have provided a solid strategic framework for Statkraft's objectives and long-term plans. The Renewables Directive is expected to result in a sharp increase in the demand for renewable energy; carbon policies are expected to be stronger; liberalization is likely to continue; and massive investments will be needed in the European power sector. Statkraft sees itself as being well-positioned to meet this new reality. Its role as a hydropower (and gas) producer will be especially relevant, as a Europe increasingly based on wind power and other unstable resources will entail a growing need for highly flexible power-production capacity. That is not to say that Statkraft would have been a dramatically different power company today if there had been no EU climate policy: but this policy has provided the company with an extra set of opportunities, a solid framework and renewed confidence.

Chapter 7 examined the fruitfulness of the national perspective. The hypotheses presented proposed that the political context characterizing both the home-base country Norway, and other countries where Statkraft operates, could explain changes in the company's climate strategy. The analysis showed empirical support for both hypotheses. The absence of a supportive policy on the part of the Norwegian authorities can to some extent explain why

Statkraft has not adopted an innovative climate strategy (H4), while support schemes in other European countries can help to explain why Statkraft has become increasingly 'offensive' in the period studied (H5). In contrast to the factors from the EU level, Norwegian policy has had a moderating effect on Statkraft's climate strategy, particularly in the short term. A weak Norwegian renewables policy – inadequate support schemes and unpredictability related to the establishment of a market for green certificates have forced Statkraft to look for good support systems abroad. The dividends policy set by the Norwegian authorities has left Statkraft with only a small proportion of its profits throughout the period, making it hard for the company to implement a more ambitious growth strategy. By the close of the period studied here (end 2009), Statkraft was still waiting for a reply from the Norwegian government on whether the current dividends policy could be altered and the company's equity could be strengthened by NOK 8 billion, in order to realize the its ambitious long-term plans.

Chapter 8 assessed the merits of theories developed under the company-level perspective. It showed that low stringency in EU policy and a lax Norwegian policy towards Statkraft are not enough to explain why company strategy has been offensive, not innovative, in the period studied. According to hypothesis 6, company 'essence' and identity are central for understanding changes in climate strategy, and this was to a large extent supported in the analysis. By looking at factors internal to the firm, it becomes obvious that the main way of thinking within Statkraft is still related to technological specialization and 'old', well-established renewables. The company's identity and history is closely tied to hydropower production, and resistance to innovation and technological diversification and development has been prominent also in the 2000s. Statkraft is meant to be run along commercial lines, and the dominant perspective in the company is that Statkraft is a user of technology, not a developer, investing where it has its competitive advantages: namely, in flexible energy production, trading and market analysis. New renewable energy sources and innovation have received greater attention than in the 1990s, but efforts have been too few and random for Statkraft to be called 'innovative' in the sense applied in this thesis (cf. chapter 2). This gives support to hypothesis 6 – as long as Statkraft lacks an 'innovative' identity, it is less likely to adopt an innovative climate strategy.

9.3 Analytical implications

The first analytical observation is that accurately understanding changes in company climate strategies requires drawing on a range of theoretical approaches, emphasizing explanatory factors at different levels. The multi-level governance approach is normally used to understand EU policy-making, but this study has shown that this approach can be fruitfully applied to the implementation of policies in companies as well. All three perspectives were necessary to provide a full picture of why Statkraft's climate strategy changed as it did, but whereas the EU perspective emerges as most important for understanding long-term changes, the national and company perspectives were central in explaining why Statkraft has not been innovative in the short term. For future work, it might be of interest to include the global and sector levels in other in-depth company studies, for an even better understanding of why companies develop as they do.

A second observation is that Steger's (1993) model fails to take into account the influence of company internal factors. Steger's typology is relevant since it highlights the influence of *external* regulations on company strategy, and this thesis has confirmed that the EU ETS and other external regulations from EU and national levels affect companies through mechanisms of risks and opportunities. However, the model lacks a necessary element: a focus on how the company itself identifies and responds to such external demands for organizational change. This thesis has argued that how a company makes use of opportunities is heavily dependent on that company's identity and 'essence'. It is not possible to understand fully the effects of a climate regulation without understanding the nature of the company/ies involved in implementing that regulation.

This means that while Steger's four categories (defensive, indifferent, offensive and innovative) have proven useful and suitable, the focus on only external determinants for climate strategies is somewhat misleading. It is for instance theoretically possible that, even with a regulation presenting a company with low environmental risk, a company may still adopt an innovative strategy. That has not been the case for Statkraft, but the discussions in chapter 8 were nevertheless based on the assumption that a combination of many opportunities and an innovative *company identity* could result in an innovative climate strategy. A company's placement on the continuum from 'defensive' to 'innovative' does not depend solely on external factors.

A final analytical observation concerns the interaction between policy instruments on the one hand, and various elements of a company's identity on the other. Different identity 'camps' within a company can frame a regulation differently in seeking to achieve their goals for the organization. The EU ETS, for instance, has been used by both the 'flexible' and the 'innovative' camps in Statkraft: the scheme has been used to justify both a more flexible (old renewables and gas) and a new renewables (innovative) focus. Indeed, one and the same policy instrument can be interpreted differently by different groups in an organization– which in turn indicates that an instrument may prove to have consequences other than those originally intended by policy-makers. This again shows the importance of in-depth company case studies in research on policy implementation – fully grasping the effects of regulations requires understanding the company's 'essence' and identity.

9.4 Further research

My major recommendation regarding further research concerns in-depth company studies. Studies of one or a few companies in comparison are of outmost importance for enhancing our understanding of the effects of climate-policy instruments. This thesis has argued that, due to the considerable influence of company-specific factors, regulations will not affect all companies equally. Moreover, different 'camps' within an organization may interpret a regulation differently, making in-depth studies necessary to show how a regulation is actually implemented.

This study has also focused on the importance of understanding how different policy instruments work together. The third hypothesis, on the effects of the complementarity of different pieces of policies, has perhaps been less thoroughly explored in this thesis. I see a need for further studies on how the different pieces of EU legislation interact at company level, especially to show whether the policies pull companies in the same direction. A whole range of new climate regulations will come into effect from 2013 onwards. It is essential that these regulations should not affect each other negatively if the EU is to achieve its ambitious 20–20–20 goals.

Regarding Statkraft in particular, future research would do well to look more deeply into the company's innovation history. That concerns not least the different 'camps' in the company,

where studies should explore the relative power of different groups as regards strategic choices.

9.5 Future prospects

The EU ETS is still a new policy instrument. Carbon trading started in 2005, and it is too soon to see all the effects of this climate policy. Thus far, the scheme has been characterized by many changes, and the revision decided in 2008 can be expected to result in a total different trading regime from 2013 onwards. Increased stringency and predictability in the EU ETS are essential to provide the necessary backdrop to changes in the power sector, and Statkraft's ambitious growth strategy. If carbon prices continue to be volatile and moderate, this may severely affect investments in low-carbon technologies. The EU is now discussing a unilateral 30% emissions target instead of 20%, as the financial crisis has led to a significant drop in EU ETS emissions, and hence reduced costs for emitters seeking to meet the current target (EU Energy 2010). The EU will need to find a solution to this problem in order to provide Statkraft and the power sector with greater predictability.

Regarding the future prospects for a Norwegian renewables policy, we may note that negotiations on a common green certificates system with Sweden were taken up again towards the end of the period under study. Such a system would provide more advantageous framework conditions for the development of new renewable energy in Norway in the next decade, and this is likely to have a positive effect on, for instance, Statkraft's plans for wind power. The EU Renewables Directive has created extra pressure for the development of a green certificates market in Norway; the Directive is also expected to result in new support systems in other European countries. Discussions on Norway's target under the Renewables Directive are still not completed, but one thing is certain: the level of this target will be of great importance to Statkraft's development in the years to come.

Finally, regarding the future prospects for internal changes in Statkraft, it will be interesting to study the effects of the recruitment to the company in the 2000s. The 'greening' of the company's communications and recruitment strategy can be expected to attract pro-active and environmentally-aware employees. Might this result in a changed view on Statkraft's role as an innovator and 'climate-leader'? Do the new employees feel that 'leading' means

leading the way into new and unproved climate-related technologies? It will also be of interest to see how discussions on community interests versus Statkraft's interests will play out in the future. Is society best served by a company that focuses on what it has already proven itself good at – or should it take some risks and seek to contribute to the technological diversification needed to face the climate challenge?

Epilogue

In the months following the period under study in this thesis (2003–2009) several important events took place, and 2010 became an eventful year for Statkraft. For one thing, Bård Mikkelsen left after nine years as company president and CEO, and Christian Rynning-Tønnesen took over.

In January 2010, Statkraft[33] was awarded the contract for Dogger Bank – the largest European offshore wind-power zone, off the northeast coast of England (Statkraft 2010a). Extensive surveys and assessments will be carried out in the following years, and investment decisions for the enormous project are anticipated from 2014. As of the end of 2010, Statkraft holds a total of five wind-power licenses in the UK. The Dogger Bank project could be the beginning of extensive involvement in offshore wind, entailing a greater diversification of the company's current portfolio.

Following a strategic review, however, in June 2010 the new Statkraft management announced that it intends to *focus* Statkraft's 2009–2015 strategy and reduce its investment plans (Statkraft 2010b). The company now plans to grow along three main lines: 1) flexible power generation and market operations in Norway and the rest of Western Europe, 2) international hydropower, and 3) wind energy in Norway, Sweden and the UK. That means that the company has reduced its focus on new renewables – the tidal project was terminated, Statkraft sold its solar power business in November, and investment plans for wind power and district heating have been scaled back compared to previous plans (Statkraft 2010b, Interviews 2010). Statkraft has also signalled that it will reduce its innovation efforts, and concentrate on the osmotic power project (Interviews 2010).

Parallel to this, Statkraft's frustration with the Norwegian dividends policy was growing. Arvid Grundekjøn, then Director of the Board of Statkraft, openly criticized the owner – the Norwegian state – in June 2010 *(Klassekampen* 2010). Thereupon the owner dismissed Grundekjøn from the Board, and Svein Aaser took over. The tightening of the company's long-term strategy was, according to Statkraft, a necessary consequence of the Norwegian

[33] The Forewind consortium, consisting of Statkraft, Statoil, Scottish and Southern Energy (SSE) and RWE npower.

state's dividend policy. As stated by CEO Christian Rynning-Tønnesen in a press release (Statkraft 2010b): 'We still need a positive clarification on capital and dividend policies going forward, but these measures underline the group's ability to continuously adapt our plans to maintain a satisfactory credit rating.'

It is evident that Norwegian authorities approve of Statkraft's more focused strategy, because the picture suddenly changed again toward the end of the year. The Norwegian Storting decided to increase the equity capital of Statkraft by NOK 14 billion in connection with the final adjustments in balancing the national budget for 2010 (Statkraft 2010d). In response, Chairman of the Board Svein Aaser said:

> The Board is very pleased with the Government's support for the company's strategy. The equity increase will enable Statkraft to strengthen its efforts both in and outside of Norway. This well-received decision will enable Statkraft to go forward with the strategy revised in 2010, for future growth in flexible and renewable energy (Statkraft 2010c).

In addition to these changes related to dividends, the Norwegian authorities' policy on renewables has also changed in 2010. Norway and Sweden agreed on a common market for green certificates in December, to be in place by 1 January 2012 (OED 2010). The new system is expected to generate 26.4 TWh renewable energy by 2020, each country financing 13.2 TWh (ibid.).

Statkraft scaled down its ambitious long-term strategy in 2010, but is still aiming at considerable growth within flexible and renewable energy worldwide. Two central elements of Statkraft's framework conditions have changed in recent months, and it will be of considerable interest to see how Statkraft chooses to utilize the new opportunities the increased equity and a new certificate market represent – perhaps it will undertake the leap to the 'innovative' category after all? Only the future will show how Statkraft, the carbon regime, and national framework conditions will develop – but there can be no doubt that Statkraft is set to remain one of the most interesting Norwegian companies to follow in the years to come.

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Appendix I: List of Interviews

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Beisland, Atle, Senior Portfolio Manager, Trading and Continental Operations, Statkraft, 15 October 2010, Lilleaker.

Skrivarhaug, Anne Vera, Chief Analyst, Market Analysis, Trading & Continental Operations, Statkraft, 6 September 2010, Lilleaker.

Dahl-Viggen, Kjerstin, Adviser, Norges Vassdrags- og Energidirektorat (NVE), 5 October 2010, Oslo.

Thue, Lars, Professor in Modern History at Centre for Business History, Norwegian School of Management (BI), 26 August 2010, Oslo.

Skjold, Dag Ove, Research Fellow, Vestfold University College, 14 October 2010, Horten.

Torvanger, Asbjørn, Senior Research Fellow, CICERO, 15 September 2010, Oslo.

Mikkelsen, Bård, former CEO and President of Statkraft (2001-2010), 13 October 2010, Oslo.

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