

PREVIOUS PAGE: At the earliest stage of Norway's industrialisation, waterpower was regarded as an almost mythical phenomenon. Such ideas were also expressed in art and this work by the well-known Norwegian artist Theodor Kittelsen is a case in point. The painting is entitled The Trolls have been Tamed.

POWER FOR GENERATIONS

Dag Ove Skjold

Power for Generations Statkraft and the role of the state in Norwegian electrification

Translated by Anna Paterson

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Hydro power stations build and owned by Statkraft until year 2000.

Introduction

Before the 2005 election to the Storting – the Norwegian parliament – the right-wing party Høyre (Right) announced that it was committed to part-privatisation of Statkraft, the state-owned power generation company. The statement triggered vigorous responses from the parties on the left of centre. The troops rallied around the social democratic Arbeiderparti (Labour Party) and jointly declared war on the very idea of allowing private entrepreneurs anywhere near the largest power company in the country. More generally, they argued that not just Statkraft but the entire electricity sector should remain in public ownership. The promotion of nationwide, preferably public ownership would ensure that Norway's assets, such as the values inherent in its large waterpower resources and potential for providing a robust, stable supply of electricity, would benefit all its citizens.

Høyre's 2005 proposal to privatise Statkraft was completely in line with current international thinking. Since the early 1990s, many countries in Europe and elsewhere in the world have deregulated the national electricity supply and followed up by fully or partly privatising production and distribution. In Norway, however, the state enterprise and the local authority-owned companies have survived the privatising trend more or less intact. One important factor was that the 2005 election brought in a new government by a "red-green" coalition under the Arbeiderparti leader Jens Stoltenberg. So far, every new attempt to push the privatisation of Statkraft has been effectively blocked by the ruling majority.² The Stoltenberg government has also taken new legislation through the Storting, which has placed even stricter limits on opportunities for foreign operators to buy shares in, let alone have significant ownership of, stakes in Norwegian hydropower production. Public opinion in Norway is apparently wholly in favour of these policies. Attitude surveys carried out over the last few years show that a large majority wants public agencies to be in charge of hydropower production and electricity distribution, while an even larger majority supports national ownership.3

The recent debate about the status of Statkraft has homed in on an important question: why has public and national ownership become such a hotly defended feature of the industry in Norway – seemingly much more so than in most other countries? And



The spectacular Skjeggedalsfossen (Skjeggedal Fall) at Odda in Vestlandet (western Norway) was a much admired tourist attraction during the 19th century. By 1906, the tourists had to give way to heavy industry when the company A/S Tyssefaldene began construction of a generating station to supply its power-hungry factory at Odda.

why do attitudes to the power industry differ markedly from those held about other state-owned enterprises? In the last two decades there have been several examples of full- or part-privatisations of such enterprises. Telenor, once a wholly state-owned telecommunications monopoly, is today part-privatised and this, as well as other privatisations, had the full support of the Arbeiderparti, among others. The leading leftwing party has actually, from time to time, been a driving force behind this process.

The question can be put the other way round: why do right-wing parties such as Høyre and the Fremskrittsparti (The progressive party) insist on privatisation of the state power company and with it, the huge asset made up of the numerous hydropower stations, of different sizes and located in every part of the country? It can hardly be a strategy calculated to attract votes, given all the evidence of solid popular support for public ownership. Does their conviction rest on current conventional wisdom that state management is inevitably less innovative and efficient than the private counterpart? Does ideology matter? Or are the key arguments related to more practical considerations, such as the need to channel state spending to other tasks?

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ELECTRICITY AND THE MODERNISATION OF NORWAY

These are some of the core questions which are discussed in this book. The book reviews the role of the state and its commitments in the Norwegian electricity sector, beginning with the very first state purchases of waterfalls in the 1890s. The account continues with the state-led expansion during the years before World War 1, the retraction in the 1920s and 30s and the new wave of more robust expansion that started after WW2. The post–90s phase of economic liberalisation takes the story up to the present day.

My objective has not been so much to describe all aspects of the developing state engagement in the sector, but rather to illuminate and debate its significant driving forces as they change with time. Why, for instance, did the state become a keen buyer of waterfalls already prior to 1900, at a time when electricity still tended to be regarded as a curiosity? What were its goals when, after 1945, the state went in for an exceptionally energetic programme of hydropower station construction? In fact, it invested so heavily that in the end it ranked as the country's largest power producer by far, with more than of a third of the total production capacity. How do we regard public and state ownership at present, given that the whole idea is questioned, while the opportunities to exert political influence over deregulated businesses are at the same time shrinking due to supranational legislation on competition? In other words, the central questions in this discourse concern how and to what extent the framework of political and institutional conditions has been reflected in the reformulations of the objectives for state ownership in the electricity sector.

The history of the electricity industry, including the role of the state in the development of the critically important distribution infrastructure, makes essential contributions to the understanding of how, in the course of the 20th century, Norway came to develop from a traditional agrarian economy into one of the wealthiest industrial and welfare societies in the world. Indeed, electricity has probably meant more for the progress of modernisation in Norway than in most nations. Thanks to its gigantic resources of waterpower (except for European Russia, Norway has more waterpower than any other country in Europe), the country had near enough unlimited access to energy during the early stages of industrialisation. The falls were waiting to be exploited and used to supply business and domestic consumers with exceptionally cheap current, and this was an asset of which the country availed itself to the full. Few realise that, as early as in the 1920s, Norway already consumed much more electricity per inhabitant than did any other population in the world. At this point in time, a larger proportion of Norway's citizens had access to electricity in the home than in any other country.⁵ As this book will show, the state was a key agency in bringing about this progress, first through general measures such as laws and regulations, later through its own power production ventures.

OWNERSHIP AND PERFORMANCE

As well as attempting to cast light on economic and social development in modern Norway, my aim is to contribute to a less dogmatic debate about forms of ownership and state ownership in particular. At present, this debate tends to be strongly polarised and ideologically driven. It also often moves onto shaky historical and empirical ground. Neo-liberal politicians and academics back up their arguments in favour of private ownership by stressing that, from the 1970s, state-run enterprises tended to be characterised by failing profitability and poor service.⁶ Few would disagree that during the 70s, the oil price turmoil and other setbacks unsettled the world economy and of course also affected many state-managed companies in infrastructure-related sectors. The often monopolistic status of these organisations had tended to weaken the drive to restructure, and to promote more cost-effective and efficient working. In the 1980s, it became clear that Norway wasn't immune to these problems. However, many of those in favour of more privatisation base their arguments on the belief that, by definition, state enterprises perform less well than privately run companies. It is however hard to explain why, for instance, several of the most expansive, aggressive and profitable operators in today's international electricity markets are at present either fully or partly state-owned, or else very recently privatised. This group includes Statkraft, the Norway's state-owned power company, which in the last few years has had results and returns on capital that many private businesses would find very difficult to achieve. During the last decade, Statkraft has also expanded into a growing international corporation. The pro-privatisation arguments also fail to account for the fact that the creation in the early 90s of the first and perhaps most dynamic power market in the world was driven by a mainly publicly owned electricity sector. In fact, this marketplace became the model for a large number of other countries. Insights provided by studying empirical data, as well as by the historical context in general, will make it possible to re-examine and clarify such apparent paradoxes.

But it is not only those *in favour* of privatisation who tend to fall back on oversimplified and stereotypical thinking; it is also true of the apologists for public and state ownership. Often, it is pleaded in defence of public ownership that it helps to sustain political and social equilibrium and is therefore especially valuable. To provide a robust and stable electricity supply system and to facilitate environmental and other political goals are examples of such socio-political gains. However, it is highly questionable whether ownership is all that significant a factor in this context, given today's deregulated, liberalised markets. As for Statkraft, the politicians have already come down firmly on the market side of the divide by deciding that the company is not to be seen as part of officialdom, but to be managed solely according to business criteria. For instance, the company can no longer be told to invest in environmentally useful projects that lack a sound commercial basis, or supply heavy industry with power at

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less than the market rate. The specific responsibility for maintaining the overall power balance in Norway has also been removed from Statkraft. In short, the company has been set free from the explicitly political and social roles which it had to perform before its liberalisation. These facts are often less than clearly stated in discussions about state ownership. In fairness, I should add that among the supporters of public ownership there are also those who doubt the wisdom of the market model. Generally, though, it seems that the logic of the market politically is well on its way to being accepted, even keenly supported. Today only a minority prefer to replace the market with a return to traditional monopoly regulation.

Some scholars have rejected such ideologically based approaches. Instead, they argue that success or failure of the power market and its operators is primarily to be found in regulatory policies, how the liberalisation processes have been carried out and, more broadly, how the institutional "environment" favours or disfavours reform and change. In other words, these scholars argue that functioning market institutions, effective regulation of competition and so on, matter more than whether a company

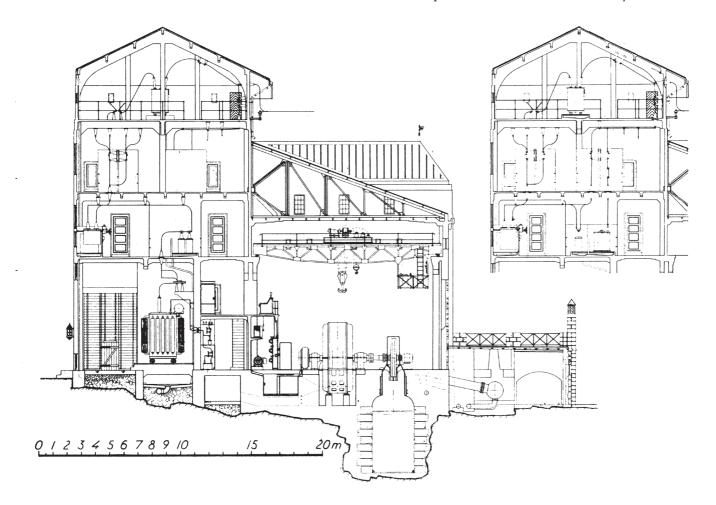
Transport workers during power development in Glomfjord, 1918

is a private or public enterprise. This book is written from such a perspective. At the same time, it builds upon the assumption that regulatory change, reform processes and adaption can be understood only within an explicitly historical framework of analysis. Allow me to elaborate.

THE IMPORTANCE OF HISTORY AND HISTORICAL ANALYSIS

Historians feel no need to elaborate on the relevance of historical analysis to contemporary issues, although others sometimes doubt the validity of basing conclusions about the present on past events. This study of "the politics of power" is informed by the approach known as the new institutional theory, which states that past decisions strongly influence later institutional and technological choices and options. Taking the case of the electricity industry, I will argue that the performance of agencies, the effects of market reform and the appropriateness of market functions are best understood in the context of developments over the last hundred-odd years. ¹⁰ In other

Engineering design, section of Hakavik Power Plant.



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words, long-standing organisational, as well as structural features of the electricity sector have shaped the implementation of the market reform and the degree to which it functions effectively.

The influence of historical realities can be illustrated by examples. For instance, that Norway pioneered the liberalisation of the power market at the time it did, was not primarily related to the influence of a general, international trend. In comparison with many other European countries, Norway was relatively late to liberalise. Rather, the main reason was that, by the early 70s, Norwegian power producers had uniquely created a form of market-based trade in power. In 1971, the National Coordinating Board (Samkjøringen Norge) set up a power exchange market in which all major and most minor operators participated. The power market was intended to facilitate flexible, nationwide pooling of power and so allow producers to meet the relatively unpredictable needs due to Norway's total dependence on hydropower. The market allowed producers with stored water in excess to sell to others with low resources. The exchange system was not based on the profit motif, but on the idea that surplus power should be handled in the most effective way within a monopolistic trade. It was perhaps especially interesting in that it habituated the producers to doing deals in a way that had much in common with the more extensive and strictly commercial trading introduced some twenty years later (in 1991). 11 This early form of marketplace also provided economists with a promising source of data. Such research, as well as practical experiences of working the exchange market, played an important role in the planning and implementation of the later market reform and eased the transition in the 90s to a more wide-ranging trade in power. Success in such cases is by no means a given, as seen for instance in the comparable deregulation of the Californian electricity industry and the 2001 crisis that followed in its wake.

Another noteworthy point is that historical circumstances eased, to a considerable degree, the transition of Statkraft into a liberalised power market. In the first place, during the twenty years of the exchange market, Statkraft had been its largest operator. Secondly, over a very long time, the company developed and put to good use increasingly complex software tools to analyse production data, make forecasts and optimise production capacity. In this context, too, it was decisive to know the background conditions characteristic of a system based on waterpower. Such tools have also proved to be exceptionally useful in adjusting to the market, in which the essential skill is precisely that of making well qualified guesses about future production and hence about pricing developments.

Finally, it is very important to recognise the role played in the successful change to market-based trading by the structure of Norway's electricity sector. The electricity distribution has traditionally been organised in a remarkably fragmented way and always included a large number of quite small operators. This made the Norwegian

system much closer to the ideal organisational pattern set out in market theory, as compared with most countries, where the structure of electricity distribution has tended to be an array of large, vertically integrated unitary companies, at either regional or national level. Such organisational concentration of all aspects of the industry has in many cases created quite major obstacles to effective competition. ¹² In Norway, it was also very advantageous that the state, through its production company Statkraft, owned the national grid, i.e., the top level of the transmission system that links regional units into a national network. It is a crucial condition for creating a power market that no single operator should own, or control in any other way, the core transmission grid. In many countries, single, regional co-owners have caused major difficulties by refusing to rescind ownership or control of their grid. In Norway, on the other hand, nothing prevented the department of state from taking the national grid out of Statkraft's control and create an independent grid operator. This intervention was completed in 1992 and the new organisation, Statnett, was provided a neutral administration and management of the grid. This served the main grid as well as the power market, which depends on smooth transmission. In turn, the existence of a neutral grid- and market operator strengthened the confidence of the traders in the effectiveness of the marketplace.

This brief historical analysis indicates that there are some structural features of institutions, which make them particularly adaptable to certain kinds of organisational change, i.e., from a monopolistic to a competitive system. It is perhaps an unexpected approach, since new institutional theory is usually applied to discussions of how the characteristics of institutions might hinder change. However, it seems that the Norwegian reform of the power trade is an interesting positive instance of "path dependence", a term that reflects a central assumption of the theory. ¹³ Later, I will present other examples of institutional structures that proved to have either negative or positive effects on subsequent change and innovation.

THE ORGANISATION OF THIS BOOK

I have organised the text along chronological lines, and split it into three main sections. Part I, which is entitled *Ambiguity*, deals with the period which starts in the 1890s and ends with the end of WW2 in 1945. The title refers to the unresolved role of the state within power generation during this time. From the 1890s and until around 1920, the state bought up plenty of waterfalls in every region in the country. Many of these falls were among the largest and most suitable for power plant construction, and the purchases made the Norwegian state into the biggest owner of waterfalls in northern Europe. But what use the state would make of its resources remained unclear for a long time: nothing forced it to be an active owner and station builder. There were several

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reasons for buying up waterfalls, but at one stage the most crucial was probably to secure strategically and economically important sources of waterpower for the nation. However, keeping such natural assets safe didn't depend on the state actually owning them. It followed that to sell on to local authorities remained a perfectly realistic alternative. Reasonably clear, direct objectives for the state interventions in the sector emerged first in 1918, when the Storting decided that the state would undertake the construction of what was, for its time, a gigantic generating station at Nore near Oslo, the capital city. The progressive politicians and industrial civil service experts, who were jointly responsible for administering waterpower and electricity, had great ambitions for the development of a wide-ranging state commitment to energy production, and especially so during and immediately after WW1 (1914-18). However, their visions crashed before taking off. The economic downturn that started in 1920 meant that the state's power interests, tied as they were mainly to the Nore station programme, plunged into a deep financial crisis. The political enthusiasm for this area of investment gradually fell to near-zero. By the mid-30s, there were actually negotiations underway about a sale of the Nore station.

No one could have predicted that the state commitment to power production would undergo a renaissance once the inter-war economic crisis had ended. The retreat of the state didn't seem to affect the rate of construction of generating stations to any great extent. In Norway, the local authorities had been heavy investors in the electricity sector long before the state got its plans off the drawing board. It was primarily the enthusiasm of local authorities for building power stations and distribution networks in their areas which had led to the early and outstandingly wide take-up of electricity in Norway before the 1920s. There was no reason why local communities should not continue to carry the responsibility in the future. However, after 1945, the state went on the offensive once more and this time with every intention to make the changes stick.

Part II, entitled *Expansion and Consolidation*, covers the period from 1945 to the mid–80s. In it, I discuss how, quite soon after the end of the war, the state returned with renewed vigour to pursue the goals that had come to the fore around the time of WW1. Now, as then, the ultimate goal of this commitment was to establish a power supply that served the "common good", i.e., domestic and ordinary business consumers. Also, the state agencies in the sector were charged with a task they had not had to deal with before: to provide the basis for the growth of "an industrial state". During the 1950s and 60s, and under the leadership of the Arbeiderparti, the social democratic party which from 1945 had come to exert virtual hegemony in Norwegian politics, the state constructed a whole array of generating stations at large waterfalls. By now, its main objective was to create good conditions of growth for new, energy-hungry industries. By the mid–60s, well over half the state's huge and growing power output supplied heavy industry. However, even in its new, expansive role, the state didn't





act as an outright rival of the local authorities, but rather as a supporter. At the same time as local public interests continued to grow, a kind of ad hoc partnership with the state developed. The local councils remained as dominant electricity distributors in their areas, while the state served primarily as a wholesale supplier to those local companies, which needed to top up their output. Also, by making selectively large contributions to communities and regions with weak finances, the state shouldered a special responsibility for ensuring that electricity was supplied in a fair and balanced way. The local authorities, for their part, rarely had any interest in meeting the energy demands of heavy industry, or capacity to do so. Nor was there much local backing, financial or otherwise, for building the so-called core grid lines, i.e., providing connections between larger districts or regions. During the 50s and 60s, the state poured money into the construction of a national grid in order to create a countrywide, cohesive system. That goal was almost reached by 1970. At that point, and at first only informally, the state also took on the function of supervisory coordinating body for the electricity sector.

Part III is called *Emancipation?* In it, I discuss the period from 1986 to the present. The chosen watershed year was picked because it was in 1986 that the state created a company called Statkraft to manage its power production. Another, arguably more radical change took place in 1991, when Norway launched the most progressive power market reform in the world. Few would deny the statement that this reform had a greater effect on the state's power enterprise than the reorganisation five years earlier. On the other hand, the changes made in 1986 allowed what I call "the process of emancipation" to start, i.e. a gradual removal of direct political control of the power trade. In the course of the 90s, this distancing grew more marked as the market reform took hold and became an established success. During this time, Statkraft turned into a nearly independent company, with objectives and long-term goals which differ hardly at all from those of other commercial businesses. This new way of working has had a whole raft of important consequences for the company, for the state as its owner and for society as a whole. In which ways does it matter that the state can no longer use its own power company as a tool for political inventions in the energy sector? Why should the state own a major business anyway, given that it is becoming increasingly indistinguishable from a private company? These are just some of the many issues, which will be thoroughly examined in the third and most weighty part of this book.

Observant readers may have wondered at the question mark in the title: why *Emancipation?* It is there to emphasise my view that there is nothing irreversible about the deregulation of Statkraft, or about the liberalisation process in general. Neither is a one-way process and the present market system can be profoundly affected by currently unpredictable factors. For instance, in many countries the margin between energy supply and demand is likely to become narrower. Were it to lead to the possibility of a national

shortage, the government must act to prevent such an outcome. This would cause repercussions in the electricity sector, which might prevent its on-going internationalisation. After all, this chain of events has a historical precedent: during the 1920s and 30s, increasingly vigorous political demands for national control of the electricity sector led to extensive buy-outs of foreign owners of production in most european countries, and a nearly complete reversion to national ownership that persisted at least into the 80s.

I would like to make it clear that to describe the last twenty years as adding up to a period of emancipation is not intended to suggest unqualified approval. Although "emancipation" usually has a positive meaning that implies deliverance, the word is used here in a more neutral sense of "freeing from control".

Statkraft has financed this project, but on the understanding that it was to be an objective and independent presentation of a historical study based on a purely academic approach. Statkraft, the commissioning body, has always respected this condition in spirit and in practice. Anything less would have meant that this book would not have been published, at least not with my name on the cover. Senior advisor at Statkraft, Trond Rostad, has supported me with his knowledge and contacts, but has never attempted to influence my evaluations, points of view or conclusions. I am deeply grateful to him and also want to thank the company leadership and staff, who have generously agreed to speak to me. I am grateful to my employers at Vestfold University College, who has supported my work by granting me nine months leave of absence. Thanks are also very much due to Hege Gundersen, executive editor at Universitetsforlaget, who has contributed crucially to the completion of the project without too great a digression from the original timeframe. Last, but certainly not least, I want to thank professor Lars Thue at the Norwegian School of Management, a colleague and collaborator in several large research projects focused on the Norwegian electricity sector, who has made all these years stimulating and instructive.

Tønsberg, August 2009 Dag Ove Skjold

*Part I*Ambiguity (ca. 1890–1945)



Chapter 1

Creating a Public Enterprise

"In this country the public power supply has developed freely into what is, in every significant respect, an activity managed by the local authorities. The organisation of our power supply is in many ways based on that of our communities. No other country has adopted this policy as consistently and to such an extent."

n 1925, Birger Stuevold-Hansen, executive head of Norges vassdrags- og elektrisitetsvesen or NVE (Norwegian Watercourse and Electricity Board), gave a wide-ranging talk on Norway's electricity supply. One of the themes that Stuevold-Hansen emphasised in particular was the role that local authorities played in the industry. It's easy to see why. By the mid-20s, the local authorities had taken over the control of nearly all of the "public power supply", in Stuevold-Hansen's words. By "public supply", the NVE chief meant electricity provision for households, farms, most of industry, and other small and medium-sized enterprises – in other words, all types of power users except heavy industry. At this time, the state had very limited generating capability. And although the private interests in power production were considerable, the investments had mainly been restricted to stations built to supply power-hungry industries. It was rare for industry to deliver power to "the general public".

Stuevold-Hansen was right to stress the rather unusual way in which the public supply was dominated by the local authorities. Many countries had developed a communal or regional involvement in local provision of electricity, in addition to private sector ownership, but none to an extent that matched Norway's. As for private ownership, it had existed in Norway during the 1890s, the earliest stage of its electrification, but as the new century began, privately run power stations supplying the general public were already becoming scarce. The field was open for a pretty complete local authority takeover. In the countryside, where electricity arrived more slowly than in towns and cities, the county councils were the main actors from the start.

This development raises several fundamental issues. The first and most obvious question concerns the reasons why the Norwegian local authorities were so keen to provide electricity. Was it due to a lack of private initiatives? Or was there a general consensus that the electricity supply should be under official control? Secondly, there is the matter of what this particular ownership structure meant for the spread of electrification. Did local authority control have a stimulating or an inhibiting effect on the uptake of the new technology?

A COUNTRY BLESSED WITH WHITE COAL

There is a story going around that the long-serving head of NVE, Fredrik Vogt, was once asked if it wasn't rather extravagant to use electric current for room heating. It was more common in Norway than in most other countries – but wasn't it a little like burning mahogany logs in a stove? Fredrik Vogt is said to have replied that, as far as he was concerned, it seemed perfectly fine and reasonable to burn mahogany, if you happened to live in a mahogany forest. Vogt's point was of course that there was no need to be strict about how electricity was used because Norway had such a wealth of hydropower.

PREVIOUS PAGE: As early as its year of foundation in 1868, the Norwegian Trekking Association devoted great attention to the spectacular waterfalls as tourist attractions. The Skjeggedals Fall (Ringedals Fall) at Odda, with 160 meters of free-falling water, was a major attraction for foreign tourists all the way back in the 1830s. Photo from the turn of the previous century. The waterfall was developed by Tyssefaldene, Inc. starting in 1906. Gunnar Knudsen proposed in the Storting [Parliament] in 1892 that the state should buy waterfalls which were valuable as tourist attractions, to protect them from development, but the proposal was not followed up.

Norway's usable waterpower corresponds to over 130 TWh (tera- or trillion watt hours).³ This makes Norway better supplied than any other country in Europe except for European Russia. Much of this potential has its origin in the country's peculiar topography.⁴ A long (500 kilometres), narrow and precipitous mountain range runs along the western coast and shelters the rest of the country from the Atlantic Ocean. When moisture-laden winds come sweeping in from the Atlantic, large amounts of rain or snow are deposited along this coastal strip. The result is an array of short, steep rivers, like a string of pearls that follows the coast with its many fjords, all the way from the south to the northern shores of the Midt-Norge (central Norway) region. By another stroke of national luck, innumerable hollows were ground into the mountain-sides during the last Ice Age. With the passage of time, nature turned the hollows into lakes, which were to serve as perfect water storage pools for hydroelectric schemes many thousands of years later.

During modern times, the bulk of Norway's population settled in the south and east of the country, where the landscape is of a more lowland type. But even here, many streams and rivers flow through the countryside. Many of the large waterways come from the same mountain sources as the rivers along the west coast. The northernmost part of the country has a similar lowland topography, strikingly seen in the most northerly county, Finnmark, which shares a border with Russia. However, the north has many large watercourses, too.⁵

In summary, Norway's resources of flowing water are not only very large, but also geographically quite evenly distributed. Even though certain areas have been especially generously provided, greater or smaller watercourses have been available for power generation in almost all regions and counties. Also, waterfalls of every size, ranging from huge to relatively small, can be developed using a variety of extraction models. Early on, the smaller falls were very well suited for building power stations to supply local electricity networks. On the other hand, the stations on the big coastal falls were soon used to feed power to large local industries. Later, as electricity provision expanded, and with it the utilisation of power, the scattered generating stations were linked to the national grid.

Compared with other countries that rely on hydroelectricity, Norway has been fortunate both in landscape structure and in its nearly nationwide homogeneity. On the European continent, hydropower is as a rule drawn from large, water-rich rivers with low falls, which tend to be concentrated in certain regions. During the early stages of growth in power production, these geographical factors contributed to the difficulties of the electrification project. Large volume flows and low fall heights mean that only large-scale installations can be profitable, and this in turn demands a high basic rate of consumption. Besides, the early transmission technology hindered a sufficiently wide use of the output from clustered watercourses. Worse, the waterpower was often



Birger Stuevold-Hansen, a lawyer, was the first Director General of Norges vassdragsog elektrisitetsvesen or NVE (Norwegian Watercourse and Electricity Board), an organisation set up in 1920. Establishing NVE meant that regulation of electricity generation and distribution nationwide became the responsibility of one single authority. The NVE also managed the state's own interests in power station construction and electricity generation.

concentrated in areas distant from large population centres. This was the case for instance in France, where the best falls are in the eastern alpine watercourses, and in Germany, whose primary resources are in its southern mountains. Sweden also faced this problem, because most of its large watercourses are in the north of the country, while people and industries were mainly localised to southern and central regions.

WATERPOWER - THE DRIVING FORCE BEHIND THE INDUSTRIALISATION OF NORWAY

For hundreds of years, watercourses have been crucially important assets for Norway's economy. Water supplied energy to enterprises like sawmills and grain mills, and from the 16th century, to the growing number of iron works. Watercourses also provided the transport routes for timber from the inland forests to the coast. Timber and wood products were major exports from the beginning of the 16th century and for several hundred years to come. Watercourses not only supported industrialisation, but also shaped the distribution of people. It is not coincidental that just about all the larger towns in eastern Norway are situated near where streams or rivers enter the sea.⁹

The power of running water was an important energy source in most pre-industrial

societies.¹⁰ However, the key technological advance in the industrial revolution of the 19th century was the harnessing of steam power to run engines. For the first time, the world had access to essentially unlimited energy, which, unlike mechanical waterpower, was not tied to a specific place. By the same token, steam power and the later development of the steam turbine were the most important means of generating electricity during the century that followed.¹¹

Norway was an exception from this pattern in that neither industrialisation nor electrification depended primarily on the use of steam power, or the steam engine. Waterpower continued to dominate also during this period. True, the role of steam cannot be dismissed: by 1900, powered machinery installed in Norway represented a total wattage of 150 000 kW and, of this, 30% was generated using steam. During the

Norway is blessed with thousands of small and large waterfalls. During past centuries, the falls have been important sources of energy for many kinds of human activity. This picture from the 1880s shows a woodchip mill in a small Norwegian community.



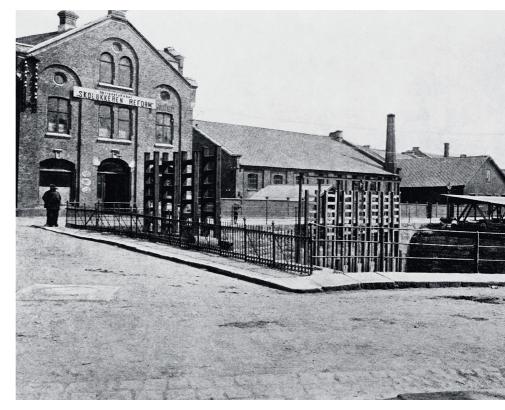
last decades of the 19th century, steam was particularly important for the development of the flourishing sawmill and mechanical engineering industries. ¹² Having said that, it is noteworthy that, at the start of the 20th century, waterpower was the source of energy for 70% of all powered installations. As industrialisation progressed, the proportion of the contribution made by waterpower grew steadily. By 1920, it had reached 90% and, by 1950, 95%. Of course, in terms of absolute numbers, the use of steam also kept rising, at least until the early 1920s. However, hydropower production grew so much faster that, already by the beginning of the inter-war years, steam was well on its way to being marginalized in industry. ¹³

Within electricity generation, the outcome of the "race" between water and steam power was decided even earlier. Norway's very first generating station used hydropower: it was built in 1877 at the mill Lisleby Brug near the town Fredrikstad. During the 1880s and 90s, several stations using steam were constructed, but the new technology never came to play a leading role in this context either. In 1901, waterpower drove more than 70% of the total installed generating capacity, which was in excess of 36 000 kW. Only a very few steam-powered stations of any size were built in Norway after this time.

The fact that steam was never extensively used has been explained, at least in part, as a consequence of the late industrialisation. Sweden, for instance, is rich in wa-

terpower, but it industrialised earlier and steam became much more important than in its neighbour Norway. Though this is relevant, it is also obvious that if Norway had not been able to draw on such large and favourably distributed waterfalls, the role of steam would have been much greater. In Sweden, steam remained important, not only for powering industrial machinery, but also for electricity generation, despite the large waterpower potential. By 1915, steam still provided more than two-thirds of the total generated output.15 The continued influence of steam on Swedish industrial expansion is mainly due to the more clustered distribution of useful watercourses and the relative lack of falls that were easily adaptable to small-scale generation, as compared with Norway.

In 1885, the industrial enterprise Laugstol Brug in the town of Skien was the first company to start selling electricity to subscribers. Laugstol Brug was backed by, among others, the young shipbuilder and industrialist Gunnar Knudsen, who was very keen on electricity. Knudsen later had two terms as the Prime Minister of Norway.



HEAVY INDUSTRY: AN ELECTRICITY-POWERED ENCLAVE

Electricity as a power-source became important to Norwegian industry at an early stage, as the graph shows (Fig. 1). The so-called "energy-demanding" industrial processes in electrochemical, electrothermal and electrometallurgical manufacturing were also major users of electricity. The electricity supply was an essential part of these processes, which were based on scientific methods in contrast to the relatively straightforward technologies of the 19th century. New technologies proved crucial for the development of industrial production and are essential elements in a new era, described by economic historians as "the second industrial revolution". Despite being on the periphery of the industrialised world, Norway could attract modern, advanced enterprises, thanks to its waterpower.

Industrial processes dependent on electricity were in use already at the turn of the 19th century. One example is the carbide production that started up in 1899 at the Hafslund factory, which relied on electrical energy generated in a station on the Sarps waterfall near Sarpsborg, a town on the eastern side of the Oslo Fjord. Industrial growth took off in earnest after 1905. Norsk Hydro's gigantic project in the remote Vestfjord valley, deep inside Telemark county, kick-started the electricity-dependent phase of Norwegian industry. Norsk Hydro began its expansion in 1905 by constructing a power station and an experimental unit at Notodden on the Telemark watercourse Skiensvassdraget. Further along the same river system, the company later enlarged the power station at Rjukan in order to achieve an output of 145 MW. When completed in 1911, Rjukan was by far largest hydropower station in operation anywhere. The power it generated went to supply a nearby fertiliser factory, also owned by Norsk Hydro. From the outset, Norsk Hydro was one of the world's most advanced companies in its field.

With time, other power-dependent projects got underway. In 1908, the company Alby United Carbide Factory started up carbide production at Odda in the west. The power came from the huge generating station in Tysse, an adjacent community. To provide the energy needed for ferrous alloy production, generating stations were built at Ålvik in Hordaland County and at Sauda in Rogaland County. Several aluminium smelters came on stream at this time, for instance at Kristiansand and Arendal in the far south. ¹⁸

Energy-dependent industries of this type were large-scale enterprises. By the beginning of the 1920s, such industries owned almost 45 percent of the country's total generating capability. However, the sector mattered little in the context of general electrification. Time and place defined the growth of power-hungry manufacturing that relied almost exclusively on dedicated sources of energy. In each case, the plant functioned as a separate entity without links to the electrical grid, which was expanding as a parallel development. The result was what some called the "dual electricity supply", which simply meant that the supply to heavy industry was largely kept apart

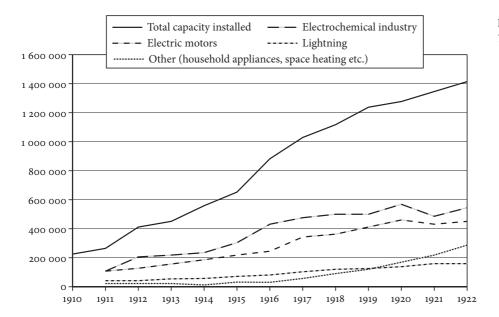


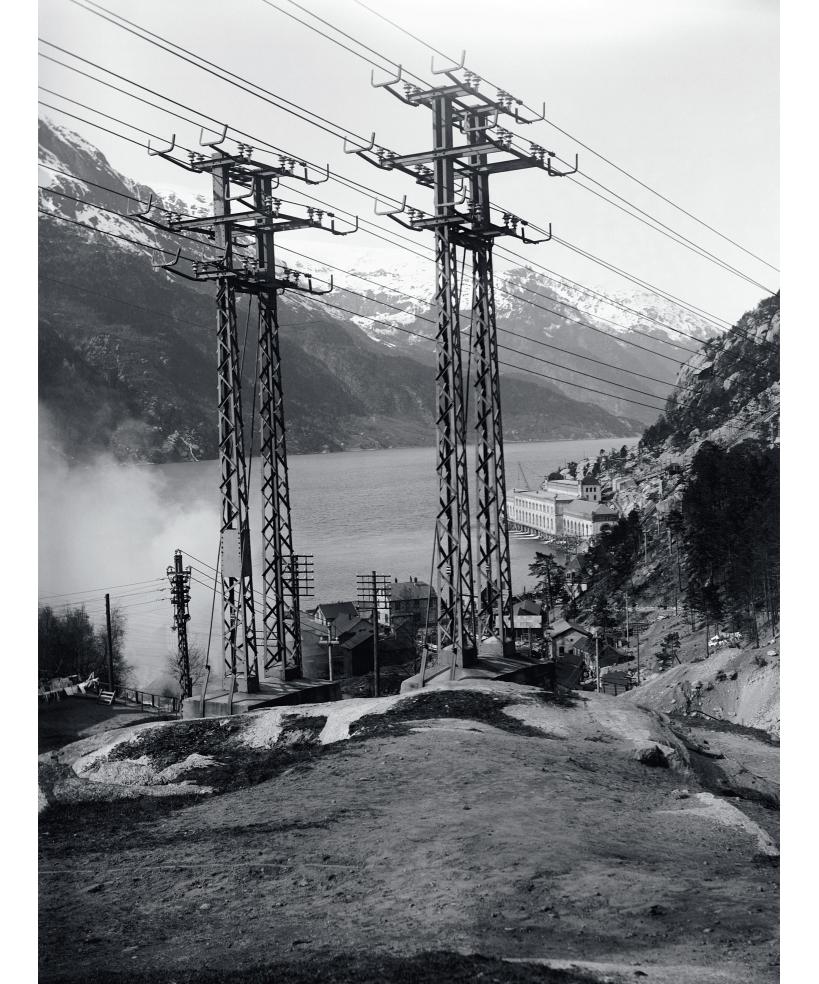
Figure 1
Total capacity installed, main purposes (kW)

from that to the general public.²⁰ The division was largely due to the fact that the big factories tended to be built in distant locations, high in inland valleys, or on sparsely populated western fjords. But the duality was also a consequence of the political thinking at the time or, to be more precise, to Norway's marked scepticism about letting the public electricity supply be controlled by heavy industry and private enterprise in general.

THE PUBLIC POWER SUPPLY BECOMES THE RESPONSIBILITY OF LOCAL AUTHORITIES

At the end of the 19th century, the generating and supply technologies were still undeveloped. Naturally, they were also seen as highly unpredictable. Who would put up with the uncertainty and risk associated with investing in this new technology?

In the vast majority of countries, private entrepreneurs were spearheading the growth of this new industry. By the 1870s, privately owned industries and other commercial ventures had begun to construct small generators to provide electric light. The so-called "block stations", which arrived on the scene in the 1880s, were able to supply current for lighting residential blocks of flats and whole city blocks. In that decade, the very first privately financed generating stations opened, i.e., businesses that generated electricity and sold it on to subscribers. In Norway too, the first such station, set up in 1885 at Laugstol Brug near the city of Skien, was privately owned.²¹ Laugstol saw daylight, as it were, just three years after the opening of Thomas Edison's Pearl Street Station in New York, which is generally agreed to be the first of its kind in the world.²²



In many countries, private enterprise remained the dominant or, at least, the most significant electricity provider well beyond the pioneering years. By 1910, most of the supply was in private hands in France, Italy, The Netherlands, Germany, Spain and Denmark, among others.²³ Across the Atlantic, the same pattern is seen in the USA and Canada.²⁴ However, there were also nations where public bodies were increasingly prepared to acquire interests in power generation, and especially within the sector we have described as "public power supply". Among them are Great Britain and Sweden, and some parts of Germany. One country stands out, though: it is Norway. There, public ownership of the public supply soon became more widespread than in any other European country.

It was Norway's local authorities which were particularly engaged developing the means of distributing electricity to the people. They seem to have taken on this task earlier than anyone else. In the 1890s, arguably the decade when electricity had its Norwegian breakthrough, some communities were already very keen. As we have seen, the first private generating station had opened in 1885, but Hammerfest, the northernmost town council in the country and in the world, was operating its own station already in 1891. It was second one in Norway and the first in city council ownership. During the 1890s, several other councils followed Hammerfest's example. Of the twenty-odd Norwegian towns and cities that were electrified during this decade, over half belonged to the local government and the rest to private enterprise. ²⁵

In other words, around 1900, a mixed ownership structure had emerged Europewide. Mostly, the proportions of private and public agents were relatively balanced, although private enterprise was dominant in many countries until after WW2 and, in some, later still. However, in Norway private electricity providers were almost rarities after the 1890s. During the first two decades of the new century, when the status of electricity was changing from curiosity to widely available commodity, hardly any private power stations were built to supply the public. The figures tell their own story: in 1924, the first year with reliable statistics, 410 localities had access "to generating stations, or to distribution networks with significant impact on the public supply" and 394 of these installations were in local authority ownership. The review also showed that, of the 850 million NOK invested so far in the public supply, local authorities had raised 85 percent. ²⁶ Between 1900 and 1920, local government in Norway had jumped at the chance of becoming involved in the sector with a determination and with results, which were frankly staggering.

FORCES DRIVING THE EXPANSION OF PUBLIC OWNERSHIP

Why were Norway's local authorities so eager to subject the electricity supply to local and public control? This is a large and complex question, which is difficult to answer

OPPOSITE PAGE: Massive transmission lines link the handsome Tysso power station to the carbide works at Odda. In 1908, the completed power station and factory ranked respectively among the largest in Europe. Unlike most countries, Norway's heavy industries were only minimally interconnected by power lines and industrial complexes tended to function as "electrical enclaves".

in a way that is both comprehensive and relatively brief. However, let me attempt to point to the most obvious and most important factors influencing these decisions.

For a start, we should take note of a crucial condition, which allowed the authorities to engage in industry: muncipal financial freedom of action. This was probably greater in Norway than in the overwhelming majority of other countries. The financial framework for the activities of Norwegian local authorities was defined in the so-called *Formannskapsloven* of 1837, or the Act of [Responsible] Chairmanship. The law is often referred to as the "constitutional foundation" for local government. Under the 1837 Act, local authorities were given independent and extensive powers of taxation, with only few stated restrictions on the kinds of economic activities in which it engaged.²⁷

Secondly, Norwegian local government had the *political will* to use to the full its freedom of action under the Chairmanship Act. A growing trend towards communities becoming involved in economic ventures took off strongly in the 1880s. This rapid growth was perhaps related in particular to the new social radicalism of the Venstre (Left) Party, the oldest political party in the country and the party that, along with the conservative Høyre (Right) party, dominated politics.²⁸ In the 1890s especially, Venstre took to the barricades to fight for the establishment of local, publicly funded agencies in a wide range of enterprises. This was in part an attempt to respond to the heightened social tensions that accompanied growing industrialisation. The Høyre Party campaigned for it, too, although with less commitment. Venstre also wanted to attract the more radical elements who were gaining wider social influence through the political democratisation at the start of the 20th century. Universal male suffrage in Storting (parliamentary) elections had been introduced already in 1898 and female suffrage followed in 1913. The corresponding dates for local council elections were respectively 1901 and 1910. At the local level, the extension of voting rights had laid the foundations for what has been characterised as the transition "from elitist to populist local councils".²⁹ As the established parties reached out towards the lower social classes, the process of democratisation encouraged new groups, which often favoured public services, to enter the political arena intending to join the decision-making.³⁰ Every political change provided another boost for local, communal problem solving and public ownership.

THE LOCAL AUTHORITY AS A MAJOR INVESTOR

This growing tendency to adopt community-based public ownership models at once brings to mind the "civic populism"-movement, which became especially prominent from the turn of the century in the USA and Canada. This movement agitated for increased democratic control of key social provisions such as the electricity supply and other important elements of infrastructure.³¹ There were, however, fundamental

differences between these populist arguments and the Norwegian "communality movement". The emergence of "civic populism" in North America was to a large extent a reaction against the dominance of business corporations within socially vital areas, including telecommunications, gas and electricity supplies. Many thought that clinging to the skirts of big business would undermine local, publicly owned institutions. By the 1920s, a handful of leading corporations and holding companies controlled most of the electricity provision in the USA.32 In Canada, too, large private interests managed supplies to major regions of the country.33 Local political organisations rarely had any chance of influencing the "big business" power brokers.

In Norway, the shift towards public ownership was not motivated by resentment of private capital, and any similarities to the civic populism movement were mostly spu-

rious. There were few large, private interests involved in local infrastructure and, on the whole, the public and private sectors were not opposed to each other. To sharpen the argument, you might well say that with regard to infrastructure-related areas of operation, local government in America and Canada had submitted to private capital, while the situation in Norway was the opposite. Some Norwegian historians have in fact emphasised this feature as characteristic of the country's modern social organisation at a still more wide-ranging and profound level. For instance, the historian Francis Sejersted has analysed Norwegian capitalism in terms of a "democratic capitalism", i.e., a form in which capital is subject to popular governance.³⁴

The powerful role of the local authority in Norway was largely based on its role as the one-stop planning regulator for "conduit systems", i.e., systems depending on physical networks, such as water and gas supplies, trams, telephones etc. The planning authority could dictate almost exactly the conditions to which private developers must conform and held the right to refuse permission.³⁵ Of course, at least in the West, planning by local permit is a practically universal practice, rather than just Norwegian. But even though we lack knowledge about the extent of development refusals, there are reasons for believing that Norwegian councils actively used their control of



Electricity revolutionised many aspects of life, including communication. Norway's first telegraphy line was completed in 1855 and its first central telephone switchboard in 1880. As early as 1894, there were 14,000 telephone subscribers in Norway, or 1 per 140 heads of population – many more than anywhere else in Europe.

planning to regulate or prevent private enterprise projects to supply electricity.

Now, it is also important to point out that public ownership did not necessarily imply doubts about, or active denial of, private ownership. It might also represent a relative *absence* of private initiatives – that is, local government compensated for low levels of private commitment. Compensation for lacking private electricity provision has been identified in some instances of council-backed gas works construction.^{36, 37} It is likely that awareness of gaps in supply was also a contributory reason when, at an early stage, some communities built local generating stations. As has been already said, Norway was short of private organisations with capital resources sufficient to invest in a public electricity supply. In places where a supply was provided from a privately financed source, it was typically drawn from industrial power stations, whose directors – with varying degrees of enthusiasm – had undertaken to let the general public buy current as a business sideline. As for the countryside, private investors were hardly likely to turn up there in large numbers, however welcome they would have been. Sparse, scattered populations do not offer good opportunities for profit; local authority intervention was not only desirable, but also very necessary. In conclusion, it seems fair to state that in Norway, unlike many other countries, the power industry never became a commercial venture and that its public status was primarily the outcome of deep political and social structures.

HYDROPOWER AS A SYMBOL OF MODERNISATION

Local government participation in the public electricity supply fitted into a wider trend towards public provision of services. All the same, their exceptionally far-reaching engagement in this particular sector remains to be clarified. For one thing, the councils showed much less systematic concern about the gas supply, which actually served many of the same purposes as did electricity. In fact, out of the 17 gas works constructed in Norway before 1911, only two were local authority-backed. Local participation in the development of telephone networks was marginal. Other infrastructure projects, such as water supply and sewage disposal systems, were constructed on a much tighter scale and only rarely extended beyond city boundaries. We need to identify the critical factor causing both wealthy and less well-off localities to invest large sums on a new, partly unknown technology with seemingly limited applications.

A striking feature of the early debates about electrification in Norway was the almost boundless expectations of the new technology and how widely shared they were. There are records of near-utopian fantasies about the new opportunities it would offer. Indeed, in the eyes of many, only electricity could change poor, marginalized Norway into a modern, industrial welfare state – a state able to satisfy people's hopes of a life that was richer, freer and less harsh. True enough, such visions were not unique to

Norway and the Norwegians. In most industrial countries, and especially early on, electricity was acclaimed as the very symbol of Progress and Modernity.⁴⁰ Even so, electricity had an unusually potent status in Norway, where it was widely seen as a force for modernisation and an agent of social reform. Obviously, this contributed markedly to the very great commitment shown by local government for the development and control of the new power source. But why was electricity given this role?

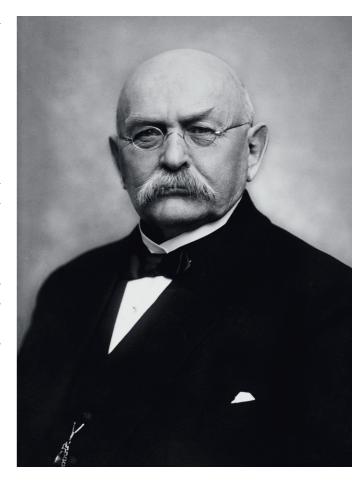
The Norwegian enthusiasm for electricity was inextricably linked to the country's tremendous hydropower resources and, from early on, visionaries realised their potential. The ship-builder, engineer and parliamentarian Gunnar Knudsen expressed a typical opinion when, in 1892, he wrote in an open letter to the Storting:

"On the subject of electricity generation, the great results of recent scientific investigations indicate decisively that our country, with its innumerable waterfalls of which only a fraction have been utilised, has conditions more favourable than any other in Europe, for development of such areas of commercial activity in which mechanical work is required."

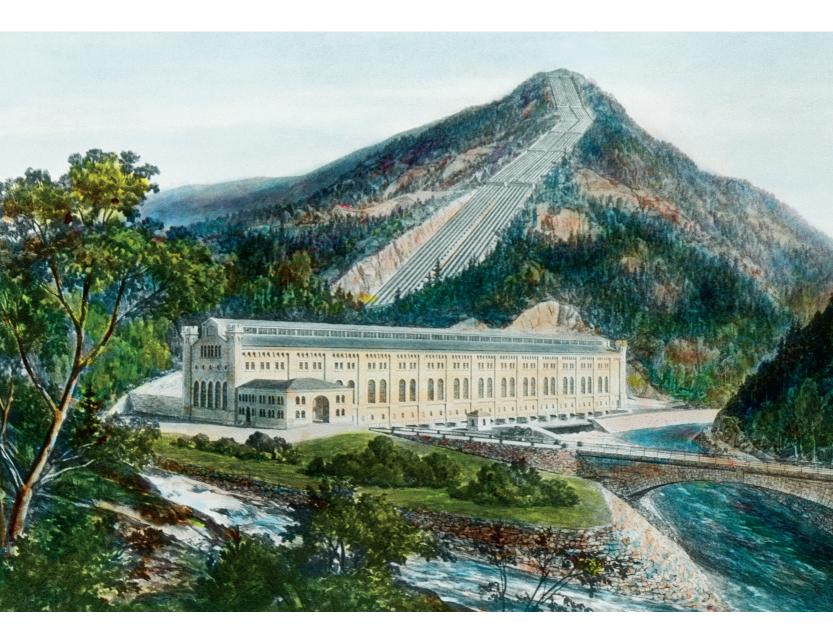
Knudsen's was not a lone voice. Many others, and especially engineers, shared his views. Well before the start of the 20th century, there was a distinct awareness that Norway's supply of hydropower compared very favourably with other countries. It was widely agreed that by exploiting

this resource, the country could catch up with the large industrial nations on the continent and make up for having been less well suited to using the great technologies of the 19th century, notably railway transport and steam power.⁴² Instead, the country had a unique advantage when it came to the most important technical advance of the new century.⁴³

One outcome of industrial expansion in the 19th century was the belief that technology would be a driving force for social progress. It became an article of faith that was widely held throughout the West.⁴⁴ In Norway, and especially towards the end of the century, the gospel "electricity means modernity" also gained by absorbing ideas from the growing movement of national self-assertion. Since 1814, Norway had been governed as part of a union with Sweden, its immediate neighbour. By then, Norway had already been ruled from Denmark for several centuries. The union with Sweden ended in 1905 and Norway became an independent state. The ambition to modernise and develop on the basis of native resources was an important element in the Norwegian nationalist movement: economic independence was to be one outcome of this



Gunnar Knudsen's (1848-1928) two terms as Prime Minister were 1908-1910 and 1913-1920. His grand vision for the development of the country's waterpower included firm state control over this resource. Between 1906 and 1917, Gunnar Knudsen was an important supporter of the introduction and later extension of the so-called "concession laws", legislation that prevented foreign speculators from buying Norwegian waterfalls, and favoured state ownership.



Nore power station was built by the state and came on stream in 1928. The preparation of the construction plans had been initiated more than twenty years earlier. This illustration shows how Gunnar Sætren (Director of Watercourses) imagined that the station would look. The drawing is dated 1910, which was eight years before the Storting (Parliament) finally decided to start construction.

change in political status. In this context, hydropower had a special role. It was seen as Norway's own, specific chance of developing into a modern, industrial state on the basis of independence. As we shall see next, national considerations were of major importance for the regulation of waterpower after 1905.

However, the nationalistic tenets were not all that strongly held at the local level, and this was of course where initiatives to develop hydropower had to be taken at first. Still, the vision of modernisation came increasingly to inspire also local politicians. Many of them, and many entrepreneurs, saw hydropower as a possible stimulus to innovation and progressive development of local businesses. This in turn would promote population growth, increase revenue from taxation and improve welfare. In many places, there was also an unmistakeable wish to derive a competitive advantage. Counties and communities which could provide large quantities of cheap electricity, were likely to expand ahead of those who could not.

WATERCOURSE REGULATION IN A STATE OF CHANGE

While it was clear from early on that waterpower was remarkably well suited to electricity generation, the advantages of developing production under public control were far from obvious. When the era of electricity began, Norwegian watercourses were in main privately owned and less subject to legal regulation than in the great majority of other countries. How did it happen that, all the same, public institutions were the chief developers of this valuable resource?

Europe has longstanding traditions of public regulation of watercourses. In some countries, they were regarded as state property already under the Romans. State ownership applied in particular to large, navigable rivers, which had key functions as communication and transport routes. The regulatory powers grew wider still well into the 19th century and came increasingly to include also watercourses that were not navigable. Above all, reform of this traditional framework of water rights was driven by a desire that the opportunities to use hydropower should be adjusted to suit the new industries. Apart from the large, public watercourses, the principle of so-called coastal ownership rights applied. It established that whoever owned a strip of riverbank also had the use of the flowing water alongside it. But in most countries, the right of riverside owners to interfere with flowing current was strictly limited by the so-called away of natural flow, which stated that no one was empowered to change the natural flow of a river. The background was the need to protect landowners further downstream against damaging interventions, such as diverting water from the main channel.

Of course, the concept of natural flow came to stand in the way of modern industrial practices. One of the problems it caused was the sheer difficulty of obtaining permission to dam in order to achieve a more even supply. The natural flow principle was an institutionalised barrier against such "novel" forms of watercourse use and, as a consequence, against modernisation. Most countries recognised this and introduced more progressive legislation. In the new regulations, principles of "reasonable use" and of "beneficial use" replaced natural flow, allowing riverbank owners considerably more freedom to control flow. The new legal definitions made it possible to put watercourses to wider industrial use. Some countries, like Italy and France, went further still to facilitate economic progress and, among other changes, introduced planning laws to prioritise industrial exploitation. In some German states, the law permitted state expropriation. It is interesting to note that Great Britain and the USA, once in the forefront of industrialisation, where among the last countries to drop the old ownership rule and the natural flow principle. It is

Before, as well as after the breakthrough of industrialisation in Norway, watercourse legislation had two chief objectives: one was to ensure "classical" communal rights, especially with regard to transport, and the other to maintain a fair balance



between claims on water access made by different local enterprises. On the whole, the significance to communities of some watercourses, and conflicts of interests it caused, had been a crucial consideration in determining the extent of both public ownership and regulatory management. That Norwegian rivers were, by and large, privately owned and less subject to legislative control than in most other countries, might have been due to the fact that claims, and hence disputes, were relatively rare and usually limited in scope. 49

It is true that the private commercial interests can generate conflict. One case in point is the crucial role played by rivers and lake systems in timber transportation, which tested the organisational skills of all involved. Early on, the so-called Timber Boards were set up to direct timber transportation on most of the larger waterways. ⁵⁰ Although the Boards couldn't deal with all problematic issues, they almost certainly served to limit the need for legislation. With time, the Timber Boards and their later replacements, the Joint Timber Associations, together with the associations of factory owners, undertook to manage watercourses for the purpose of timber transportation. Once the era of hydropower expansion had begun, the power producers usually joined the organised factory owners and so became part of an existing, voluntary system of

coordination.⁵¹ As it turned out, combining the responsibility for timber transports and power production was a good idea. These sectors often had overlapping interests, for instance in projects to smooth out seasonal changes in water flow.⁵²

But, of course, it will not do to suggest that all was well with the management of Norwegian river systems. Tough confrontations did occur, between timber companies as well as other parties. Even so, the issues at stake were rarely hard enough to need resolving by public bodies. It is important to note that the construction of hydropower stations in Norway didn't challenge established interests, nor lead to calls for state intervention, as often as in other countries. Only in 1887 did Norway get watercourse legislation that explicitly stated that its aim was to assist in the development of new ways to exploit waterfalls. The Act of 1887 provided, among other things, for wider powers to dam and regulate

OPPOSITE PAGE: Strong reactions came from many quarters when it became apparent that the state planned to regulate Gjende and Bygdin. One of the most active opponents at this time was the botanist Hanna Marie Resvoll-Holmsen, who had already expressed her fear in the Norwegian Trekking Association's Yearbook for 1917 that "industry's long, bony arm might poke in here between the mountains and scoop off Gjende's emerald green water".

Norway's topography means that its waterways tend to be unsuitable for shipping. In the 19th century, canal construction took off. Two large canals were completed in the east of the country. The illustration shows a part of the Bandak-Norsjø canal, which reaches far into Telemark County.



Norway was a major exporter of timber to Europe already in the 16th century and rivers served as essential transport routes from the inland forests to the sawmills and shipping ports. Log drifting, as shown in this photograph from 1934, was the most common way to transport timber until well after WW2.

flow in connection with industrial activity. In other words, it adopted the principle of beneficial use, as explained above.

But it is noteworthy that the new proposals were not drafted with the aim of changing existing laws on private ownership. It was not regarded as necessary to interfere with the Norwegian ownership structure to allow for new forms of use. Instead, the old principles were carried forward, just when many other countries had got rid of them, or were about to jettison or substantially limit their applicability. In



contemporary "progressive" circles, the 1887 law was thought old-fashioned and not visionary enough. ⁵³ In fact, private ownership hardly ever proved to be a substantive obstacle to new, more wide-ranging forms of watercourse exploitation. At least, there is little evidence to suggest that the increasing "industrialisation of the rivers" of the late 1880s had met with serious resistance from other interests. ⁵⁴ When public ownership nevertheless became the norm in Norway, the reasons were quite different – as we shall see below.

HYDROPOWER IN THE HANDS OF SPECULATORS

The principle of private ownership made Norway's waterpower a resource that was easily marketed. Traditionally, rights to waterfalls were bought and sold without public regulation, regardless of whether the falls were large or small, and without restrictions on foreign purchasers, who were in practice equal to Norwegians.⁵⁵

Traditionally, people had not been fighting over the waterfalls, with the exception of certain falls of the eastern region, which had powered sawmills for hundreds of years. However, towards the end of the 19th century, power generation technology and the growth of industries meant that waterfalls acquired a new and greater potential. During the 1890s, foreign industrial or venture capital companies bought several of the larger, more central falls in the eastern region. ⁵⁶ By the turn of the century, the dramatic "race for the falls" had started. By now, both Norwegian and foreign interests were very keen to buy on a grand scale. Falls in southern Norway were particularly sought after and not only at sites along the coast or near major population centres, but also in more remote, sparsely populated inland areas. Some purchases were made for specific industrial purposes, but most were acquisitions intended to be sold on at sizeable profit – the contemporary expression was "fall speculators".

Initially, the trade of the fall speculator grew out of the limelight, but by 1905 it had become subjected to closer scrutiny. Partly, this was because the sellers – local farmers, in the main – often lacked insight into how rapidly the value of the falls was increasing and were paid accordingly. Stories soon started circulating about massive falls changing hands for disproportionately small sums. Perhaps even more important was the frequency with which the buyers turned out to be foreigners, or to represent foreign interests. Naturally, this did not go down well in a nation committed to liberating itself and gaining independence. The turning point came in the spring of 1906. A series of critical articles in a leading newspaper insisted that, among others, Swedes were acquiring substantial sources of waterpower. Allegedly, the deals were kept secret by using so-called "front companies", i.e., companies with Norwegian names, or managed by Norwegians, but owned by foreigners and controlled from abroad. The newspaper articles triggered violent debate, both in the Storting and elsewhere in official Norway.

The outcome was the so-called "Panic Law", which got into the statute books later that year. The Panic Law, as the name suggests, was a rushed measure, intended to deal with a trend that seemed to threaten fundamental Norwegian rights. Most importantly, it defined a contractual license, or concession, that potential foreign purchaser had to obtain before being allowed to buy a waterfall in Norway. That is, the law did not forbid foreign ownership of waterfalls, but insisted that only the government could allow the deal to go ahead.

The Panic Law brought the waterfalls under national control. Actually, since 1888, non-Norwegian legal persons had been required to obtain permission to purchase real estate in Norway. However, the Panic Law extended this condition to non-representative Norwegian companies, i.e., those with foreign-owned majority shareholdings. In other words, it prevented purchasing through front companies. And it wasn't the end of the matter: the Panic Law initiated a thoroughgoing revision of the entire state system of watercourse regulation.

LAND CONCESSION LAWS: LOCAL AUTHORITIES ARE PRIORITISED

The Panic Law was the start of a decade-long political battle, often referred to as the "concession debate". It ended only when, in 1917, the Act on Acquisitions of Waterfalls, Mines and Other Real Estate passed into law. Meanwhile, the legal framework for buying and developing waterfalls was amended repeatedly and grew steadily more restrictive.

An essential feature of the concession laws was that the distinction between foreignand native-born property owners was gradually weakened, and that between public
and private ownership strengthened. The advantage came increasingly to lie with the
public owners. Step by step, the requirement to be licensed, both to buy and to manage
waterfalls, came to apply to Norwegian individuals and companies. Furthermore, private owners were also subject to the so-called *hjemfallsplikt* (end-of-lease obligation).
At the end of the period of the lease, the rights to the fall and to any generating stations
returned to the state. Local authority investors were spared not only the requirement
to be licensed in order to buy the lease, but also to meet the end-of-lease obligation.
Obviously, local authorities found it very helpful to be exempt and felt free to invest
in power station construction, secure in the knowledge that it would remain theirs
for all eternity. There were also other passages in the legislation, which essentially
favoured local authorities.⁵⁷

Naturally, the land concession laws did not immediately shake up the ownership structure of waterpower resources. In no sense did the legislation abolish the fundamental principle of private property rights. Purchased waterfalls continued in private ownership and falls that were already developed, or developments that had received

planning permission before the end-of-lease obligation had passed into law, were exempt. However, in the long term, the new laws on concessions and, in particular, the clauses setting out the end-of-lease obligation, would lead to a gradual transfer of water resources to the state. True, the period of the lease was long – 50–70 years at first – and in certain circumstances, the law permitted extensions. But nothing changed the fact that private hydropower stations would end up as state property. The end-of-lease clauses defined the conditions for a form of gradual nationalisation of private waterfalls. It should be pointed out that a sale of a local authority-owned waterfall to a private agency would trigger an end-of-lease situation, even though the leasing clauses had not applied to the initial purchase. At the time, the there was strong support for the principle that local authorities should be prioritised developers of the public electricity supply.

The existence of these restrictions of course affected private participation in the development of the power industry. Local government, keen to protect the advantages conferred by the concession laws, treated suggestions of privately owned plants sceptically. In other words, the new regulations meant that private capital came to play only a very minor role in the provision of the electricity supply to the general public. Seen from a longer perspective, local government privileges significantly reduced private investment in hydropower across the board; its wide-ranging public monopoly rights made the private producer's situation uncomfortable. Also, market opportunities narrowed dramatically.⁵⁸ To whom would a privately run power station deliver its output?

The concession laws may also have affected construction of power stations linked to heavy industry, but the extent is unclear. The belief that the new legislation hindered industrial expansion in Norway is part of conventional wisdom. ⁵⁹ On the other hand, there are those who argue that the laws were not at all strictly interpreted, especially in the earlier years. It has been pointed out that, for one thing, private industries using hydropower started up also after the leasing clauses had become law. ⁶⁰ Actually, neither set of opinions is based on sufficiently strong empirical data. ⁶¹ But it seems likely that the concession laws dampened private interest in investing in this area, particularly after the most restrictive of the new regulations, the acquisition law of 1917, had come into force.

POLITICAL BATTLES ABOUT THE SHAPE OF FUTURE SOCIETY

Some historians argue that the concession laws, and the issues they raised, add up to the single most controversial topic of Norwegian politics in the first half of the 20th century. As we have already noted, it is true to say that people and politicians were united behind the decision to control foreign acquisitions. The strong prioritisation of public ownership was much more controversial. Stated simply, the battle lines were drawn between the conservatives, in favour of minimal state intervention in the use

and ownership of waterpower, and the social liberals and radicals, who held the opposite view. In other words, traditional ideological standpoints with regard to the role of the state drove the opposing arguments.

At the same time, it has also been said that the battle about the concession laws was just a restatement of a more deep-seated political conflict about what were the most desirable social and economic developments. The concession laws were directed against private ownership in general, but more specifically against big capital and big industry. Of course, initially the large industries were the only agencies able to develop major waterfalls. Many social liberals and radicals regarded these industrial giants with distrust, partly out of fear for their economic and political power, and partly out of a concern, shared by many, that large factories were sources of radicalisation and social unrest. In these circles, the ideal "harmonious" and democratic development of the economy was to be based on small units and decentralised ownership. Their opponents welcomed big industry, regarded as the organisational model for the future. They spoke of the leading economic powers, such as Great Britain, the United States of America and Germany, where the growth of giant industrial corporations appeared to be the perhaps most important characteristic of ongoing industrialisation. 63 However, in the concession law debates, the winners were those who fought for a localised, democratically run economy. We have noted before that Norway's economic and political system is strongly dominated by democratic norms and traditions. Such deeply rooted tenets formed the basis for the defence of the "small-scale economy" and, in turn, shaped the concession laws.

This photo from the 1920s shows power transmission lines under construction. The hydropower station is in Ålfoten in Vestlandet. The Ålfoten development is a good example of the kind of money that could be earned by buying and selling waterfalls. The industrialist and waterfall speculator Ragnvald Blakstad bought development rights for the waterfalls in the area for 6,500 NOK in 1899. In 1918, a power company run jointly by the local authorities bought the very same rights from Blakstad for 900,000 NOK!

NORWAY: "THE ELECTRIC COUNTRY"

In conclusion, we will look at the electricity supply in Norway at the start of the 1920s. How far had electrification advanced? Consumption per head of population is one possible measure, as is the number of households with access to electricity. How did Norway compare with other countries on these counts? This overview will also examine electrification status in the context of ownership. What effect did the ownership structure have on the spread of electricity?

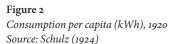


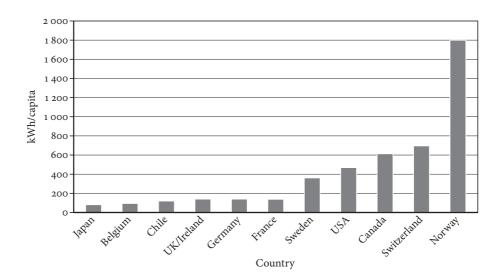


In terms of the measure "consumption per head of population", Norway's position at the start of the 1920s was most unusual, as clearly shown below (Fig. 2). Norway was not just out in front, it was in a league of its own. The Norwegians consumed on average 1,800 kWh per year, while the Swiss, who ranked second on the list, managed only 700 kWh on average. Consumption in large industrial countries, such as the USA, Germany and Great Britain, tended to be much lower still.⁶⁴

It is true that comparisons of averages can easily create incomplete, even quite mistaken, ideas of how widely electrification had spread. This would be the case if, for instance, only a small group had owned a majority share of the machinery of production and hence consumed the bulk of the power output. At the start of the interwar years, this was to some extent true of Norway. In 1920, a small cluster of power-hungry industries consumed about 45% of the total output and also owned a comparable proportion of the productive capacity. As we have noted above, these companies also had marked "enclave" characteristics, in the sense that they had few links with the rest of the economy and with society at large. They employed relatively few workers, focused almost exclusively on exports and were mostly owned by foreign capital. As we have noted, these companies had almost no significant role in supplying the public.

The dominance of big industry is not going to diminish the impact of the data displayed above. Even if industrial consumption is taken out of the data, Norway remains at the top of the international rank order. The public supply was also exceptionally large. The proportion of the population living in households with access to electricity was also higher than in any other country. As shown in the next graph (Fig. 3), by the early 1920s, more than 60% of all Norwegians had access to a domestic current supply. Canada and the USA were the runners-up with about 40%, but in Norway's neighbour Sweden the proportion was below 20%, despite its large hydropower resources.





What was the explanation of the fact that a sparsely populated country, with its scattered population and location on the very margin of industrialised Europe, turned out to be such an undoubted leader of nationwide electrification? Was it simply that Norway had been lucky in having outstanding natural energy sources?

We have already seen that Norway's hydropower resources gave it a very favourable position from which to start. At the same time, the ownership structure obviously contributed to both the spread of an electricity supply and a high rate of consumption. We have noted that once the local authorities took on the role of power producers – with the effect that the electricity supply belonged to the community – the subtext was that all the local people should have a share of the new asset. Initially, it was probably not quite so straightforward in practice. However, the public power companies often extended the distribution network far further than was necessarily good for business profits, and hence often further than a privately owned company would have done. In other words, local authority ownership was one of the circumstances that promoted the wide reach of the general supply. Also, the effect was often redistributive in the sense that the profitable parts of the business were made to subsidise the unprofitable parts.

The significance of forms of ownership is also indicated by a comparison between the situation in Norway and in countries where ownership was mainly in private hands. In the USA, for example, the electrification of the countryside had been very sluggish, because power companies realised it made no great business sense. ⁶⁵ In the towns, too, the domestic take-up of electricity remained relatively slow until the end of the 1920s. The American historian Ronald Tobey has suggested that power providers placed low priority on domestic supplies given that profits were so much lower compared with industry. According to Tobey, the providers also set escalating tariffs

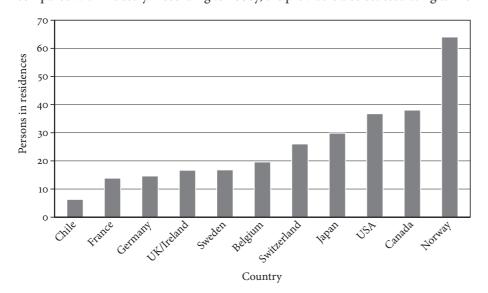
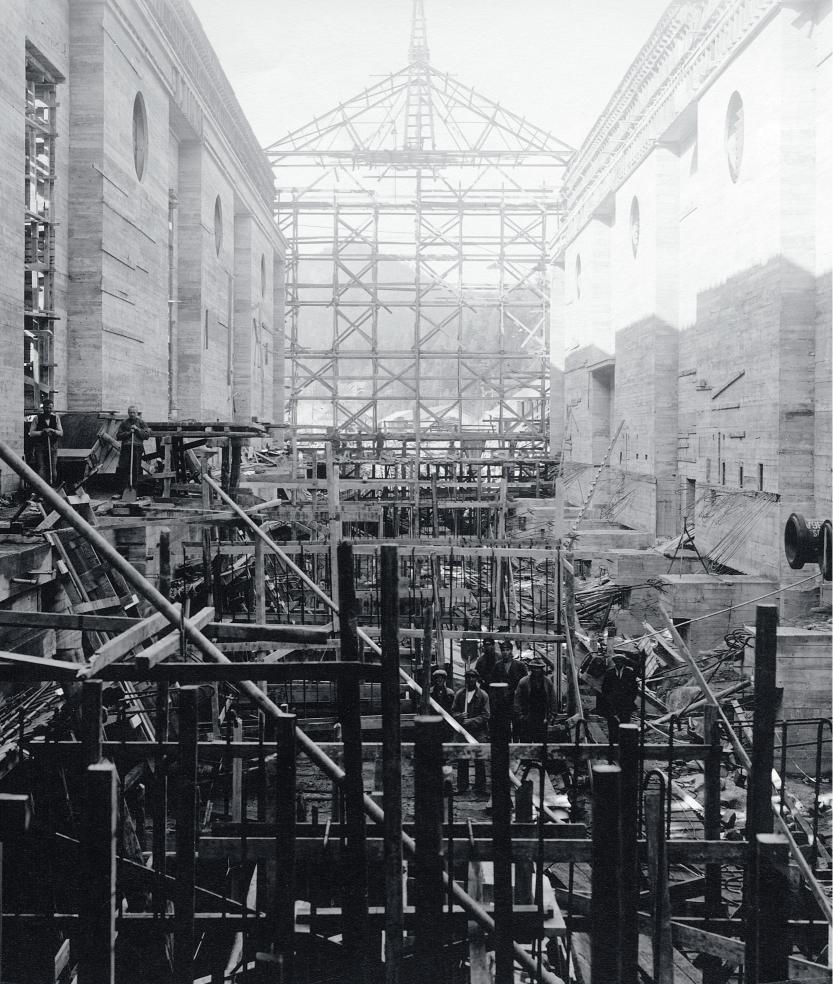


Figure 3
Persons in residences with electricity in percent of total population



that did nothing to stimulate consumption. 66 In Norway, the drive to maximise profits was absent and this naturally made for lower prices. At the time, Norwegian power suppliers consistently set their tariffs so as to stimulate the use of electricity. 67 The local authority owners in fact took their role as entrepreneurial leaders of the power industry very seriously. All these factors, in addition to the country's abundant hydropower and the duty of community-owned electricity providers to extend the distribution network to reach all the local citizens who wanted it, served to make Norway the most extensively electrified country in the world already in the early 20s. At this time, however, also the state was ready to become a power producer and the national electrification process was about to enter a new stage. This is the theme for the next chapter.

OPPOSITE PAGE: In 1892, the capital of Norway, Oslo, opened a city council-run power station. In 1894, the city had also installed an electric tram network, the first in Scandinavia. The picture shows a tram on its way across Eger Square. The Royal Castle can be seen in the distance.



Chapter 2

From regulator to entrepreneur

The first signs that the national power policy was radically changing direction came in 1918. The state had been an active regulator of power provision for a long time, but only engaged itself in production to a very minor extent. However, 1918 was the year when the Storting decided that the state should develop the huge Nore falls in the Buskerud district in eastern Norway, about a hundred kilometres from the capital city. This was in clear breach of its own previous policy. The Nore capacity of more than 200 MW would make it one of the very largest hydro-power stations in Europe, and the state one of Norway's largest power producers by far. The plan was to use the output to provide electricity for the general public in the eastern region or, more precisely, to the electricity companies and regional power suppliers run by the local authorities.

hat was the reasoning behind the Nore project? The conditions had long been thought to favour such a development. The state had begun to buy up the rights to waterfalls even before the turn of the century and its holdings were accumulating, slowly at first, then at an increasing rate after 1906. Indeed, purchasing had become so brisk that, by 1918, the Norwegian state was one of Europe's largest owners of waterfalls. Its primary aim was to secure national ownership of the most sizeable waterfalls with the best industrial potential, although not necessarily to carry the construction programmes forward. However, as time passed, the state's new role raised expectations, not least in the eastern region, where it owned several of the biggest and most promising falls. Many thought that limits should be set for how long officialdom could keep its "dead hand" on such valuable resources. Sooner or later, it was argued, these falls must be handed over to able and willing developers, or else the state itself must undertake the task. In the Storting, district representatives from the eastern region supported the latter option with particular alacrity. They demanded that the state should shoulder its responsibility for providing a modern electricity supply to all localities, including those lacking funds or suitable waterpower sources. In the first instance, state-owned falls would be used to equalise supply.

Such arguments were widely accepted during this period, as the political consensus increasingly came to back ideas about social welfare and fair distribution of wealth. The social liberal/radical party, the Venstre (Left), dominated the Storting in the period 1905–20 and was especially keen to promote more interventionist policies along those lines. One of the main aims of its social policy at this time was to provide the cheapest possible electricity to as much of the population as possible. The party had agreed that it was perfectly acceptable to use the state apparatus as a means of achieving its goal.

However, had World War 1 not broken out in 1914, it is doubtful whether the development of the Nore falls would have been undertaken four years later. The war contributed in many ways to strengthening the arguments for active state involvement in the energy sector. In the first place, the collapse of coal, coke and liquid fuel imports caused major energy shortages in wartime Norway. The supply deficit had serious consequences for both businesses and households, and, as time passed, grew into a critically important social problem. By then, it seemed only natural for the state to intervene more actively and, for instance, promote the development of indigenous hydroelectricity in order to replace the lost energy sources from abroad. Secondly, the energy crisis also made large power projects more realistic, including Nore. The lack of imported energy sources was a factor in what became massive transfer to electricity, which in turn meant that large-scale hydropower projects no longer seemed as risky as before. A third effect of the war was that the exceptional conditions drove an

PREVIOUS PAGE: Under construction: the turbine hall of Nore power station, the largest hydropower station in northern Europe. The state undertook the building and the station started up in 1928, supplying power to local authorities in central Østlandet.



all-round easing of the criteria for state investment. Last, but not least, throughout the war years, new views on how to improve the electricity supply gained ground. Projects such as the Nore one were favoured, because large power stations and large, integrated distribution areas were seen as crucially important. Generally, systems operating on a large scale were taken to imply a more effective type of organisation. The backing for such up-scaling was particularly strong inside the departments of state that managed hydropower and electricity.

According to Johann Collett-Holst, head of the team charged with overseeing the construction of transmission lines for the Norwegian state in the 20s, there were hardly two transmission lines in the world with the same mast structure. This photo of pylons in Østlandet, as they looked in 1925, shows clearly how great the variations could be.

THE NORWEGIAN STATE BECOMES NORTHERN EUROPE'S LARGEST OWNER OF WATERFALLS

As we have seen, one of the most important tasks for the state was to smooth the way to local authority ownership of hydropower. As 1920 approached, councils were acquiring a extensive resource base in this sector. It is true that the purchasing of waterfalls by local authorities was not just done with short-term needs in mind. In particular,



A woman collects coke from the Provisions Council in Oslo. The Provision Councils came about as a result of the general supply crisis during World War I. They were established 26 July, 1916 with the task of organizing the delivery of necessities for the population's needs. when some of the financially strong authorities bought up falls at an early stage, in locations that quite often were quite far away, their aim was to meet anticipated needs for long time ahead.²

However, at this point, the state too began buying up waterfalls. Already before the turn of the century, the Storting had voted through money, and purchases were made, especially in southern Norway, from the mid–1890s onwards. The pace accelerated, making the period between 1907 and 1920 a very active phase. It was in 1907 that the Storting decided to buy the Nore falls in the Buskerud district. In western and southern Norway, the state bought the rights to develop, among others, the Ulla and Kvina watercourses. In the northwest, state ownership included the Tafjord and Rauma watercourses, and, from 1918, the falls in Fykanåga, with its existing power station at Glomfjord. In the east, in addition to the Nore falls, the state bought the rights to Mår and Tokke watercourses, among the very largest in that part of the country.

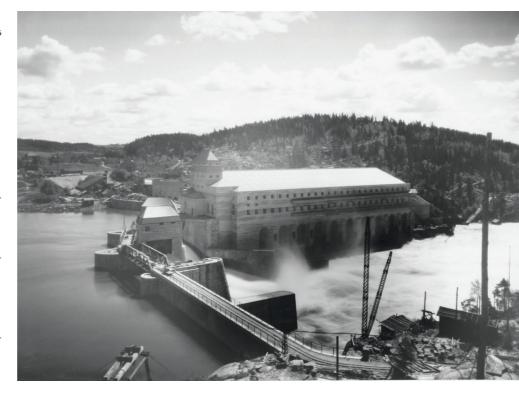
By the start of the 1920s, this purchasing policy had resulted in the state owning waterfalls with a combined capacity in excess of 1,000 MW. Also, it held extensive rights to falls on older state-owned land, which provided at least another 700 MW. Hence, by 1920, the state owned concessions with a potential output amounting to more than 1,700 MW, which corresponded to at least four times the combined developed capacity that supplied the nation with electricity at the time. This made the Norwegian state the largest owner of waterfalls in northern Europe.³

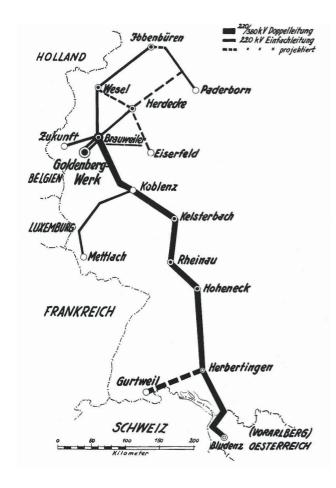
What were the motives behind the state spending on waterfalls? Apart from the earlier purchases made mainly to satisfy the needs of the state railway company, the Storting actually had no clear ideas about what the falls might be used for. In the first instance, they were bought to ensure that they remained in Norwegian ownership. In other words, it was in response to the original intentions behind the legislation about concessions, which, as we have seen (cf. Ch. 1), was enacted to regulate foreign ownership of Norwegian real estate assets. Secondly, the Storting's ambition was to provide security of supply to the general public. The situation had to be prevented from developing into one in which large, highly capitalised industries had acquired the best falls at the expense of local authorities and the public electricity supply. In Østlandet (eastern region), industries owned many of the best falls, including those near towns and more densely populated areas, which would have been especially well suited to supplying the public.⁴

There was a third and important reason for buying falls: it would help to prevent the establishment of power monopolies. Around the turn of the century and notably in the large industrial countries, there was a new and growing trend of collaboration between enterprises leading to monopoly and corporate group formation. In Norway, this tendency was regarded with scepticism. Large corporations, as well as concentration of markets and capital into few hands, were phenomena that did not fit in at all

well with the Norwegian ideals of democratic control, small-scale organisation and decentralised ownership structures.⁶ Anyway, because waterfalls constituted a limited resource there were also good grounds for regulating ownership rights. Any entrepreneur who owned a large proportion of local hydropower would be nearly immune from competition in that region. Besides, the transmission technology itself lent itself to monopolisation: if an entrepreneur built or came to own the grid supplying a region, other operators might find access to transmission very difficult.⁷

The state was able to counter the tendency towards power monopolies through strategic purchases of waterfalls. It was however not only a case of reining in private capital. When it came Solbergfoss power station in Østfold came on stream in 1924. It was the outcome of a project run jointly by the Oslo council-owned electricity company and the Norwegian state. The Solbergfoss is part of the River Glomma, the largest watercourse in the country. Contrary to most of Norway's hydropower installations, it was a typical "run-of-river" power station, i.e., lacked facilities for storing water.





Sketches dating back to around 1920, showing the electricity generating and transmitting system of the German company RWE (Rheinisch Westfalische Elektrizitätswerk). Between the world wars, most of the industrialised countries were going in for large, integrated systems – as did Norway. During this period, the local distribution networks were gradually being merged into larger, regional units, particularly in the eastern region.

to power monopolies, the threat might just as well have come from town councils with good finances. That local authorities acquired fall concessions was initially seen as positive: the entire hydropower management plan was based on this intention. But, at the same time there was a clear understanding in the Storting that hydropower ownership must be reasonably evenly distributed between muncipalities and regions. The country must not end up with the well-off authorities owning all the best energy sources, while the poorer ones were denied useful access. Such concerns expressed the concept of hydropower as a shared social good.

To summarise, the state had three main reasons for buying waterfalls: tipping the balance of owner nationality, counteracting monopolisation and securing a fair distribution of hydropower. But how would the falls be used in practice? Should the state develop the stations and continue to own them? Or were there other solutions to these problems?

WORLD WAR, STATE EXPANSION AND ENERGY CRISIS

It was not a foregone conclusion that the state should become the developer. Before the First World War, several official investigations had argued against a wide-ranging state commitment to power production.¹⁰ The generally agreed view seemed to be that the future

role of the state should be to make things easier for the local authorities and, in any case, not hinder them. One report concluded that some of the waterfalls ought to be sold on to local authorities which had failed to acquire any. The state should step in only in order to support local authorities which could not manage to act as developers on their own. In other words, the task of the state was to be limited to what might be called "social development of hydropower".

War often brings big changes. During the First World War (1914–1918), the economic influence of the state widened radically. This had little to do with political ideology. The objective was to secure distribution of and access to vital goods such as food, clothes and fuel. Businesses and consumers alike had to put up with the state deciding, to a much greater degree than before, how and by whom resources were to be used. Also, its nearly unlimited willingness to spend money was a striking feature of the time. Between 1914 and 1920, state spending increased more than six times, from 123 to 746 million NOK. 12 It has been pointed out that the cash flow grew without anyone having an overview of the full extent of its growth. "Disorder in the national

economy" is a phrase that has been used to describe what was happening during these years. ¹³ The reduced constraints on state spending presumably contributed to making the realisation of large investment projects easier.

The energy supply was one of the areas with a strong state presence. Norway had never before experienced a critical shortage of this vital commodity until the war years, when imports of coal, coke and liquid fuels fell dramatically. The country was vulnerable: at the start of the war, imported fuels represented as much as 70 % of the total energy consumption. The country had never before been so dependent on imported fuels. ¹⁴ In the course of the war, the proportion contributed by imports was reduced to less than 40 %.

In these circumstances, the state had to take a greater share of the responsibility for energy provision and began to import coal to supplement the private trade. It also intervened directly in the distribution of energy sources by imposing rationing. The supply crisis triggered a fundamental rethinking of the official energy policy, since it had proved the inherent weakness of being dependent on imports for socially crucial commodities such as fuel. There was actually no need for Norway to have ended up in this situation. The country could be well on its way to self-sufficiency through a more focused investment in hydropower projects. Electricity had obvious potential advantages. During the war years, consumption had increased massively, so much so that many electricity companies and power stations had found it problematic to keep up with the growth in demand. Towards the end of the war, several electricity providers had to introduce current rationing.

Before the war began, some politicians and engineers, and also others concerned with energy issues, had raised the possibility of an increased level of national self-sufficiency based on developing hydropower. In the course of the war, they received a great deal of support, as did those who argued that the state should be allowed to play a bigger role in this area. Small-scale electrification with local authority backing would not be helpful: the investments must be shifted towards the construction of power stations large enough to supply whole counties or regions. Building large-scale power stations, as well as electricity transmission and distribution systems, was however something that it was felt only the state could undertake. Helpfully, the state already owned a whole array of major waterfalls. Finally, another important consideration was that highly ambitious projects of this kind seemed much less risky in 1918 than in 1914. It was a widely shared assumption that the strong growth in electricity consumption seen during the war would continue, even though other conditions would return to normal. Good future trade returns from selling power, even if in large quantities from new sources, was regarded as guaranteed.



In central Østlandet, the Nore power station and its transmission lines made a major contribution to integration during the interwar years. Current from Nore started to flow in 1928 at a voltage of 132kV, the highest so far in use in Norway.

A NEW PARADIGM

Those in favour of increased investment in large-scale power stations and electricity transmission systems could point to developments in the main industrialised countries. Until the time around the start of WW1, supplying electricity had in most cases been a local activity, in Norway as well as elsewhere. However, the war years had seen the increasingly large and more integrated systems for electricity provision being built, developments which were most pronounced in Germany and the USA, and to a lesser degree in countries such as Great Britain and France. Several factors had led to this increase in size of the systems. One factor was the ongoing improvements

in technology, which made possible the transmission of electricity in large quantities over great distances. ¹⁷ Another factor was the development of the steam turbine with its considerable "advantages of scale". Of course, constructing ever more effective turbines was conditional on there being a market for power, but the market had expanded in parallel with the distribution system. Large systems, and hence markets, also had other things in their favour: wider access simplified the process of building up a customer portfolio with different consumption regimens, which in turn evened out oscillations in generator loads over the 24-hour cycle. ¹⁸ Finally, advantages were to be had by "coordinating" stations with different production schedules, i.e., connecting the plants brought opportunities for major gains in efficiency. In addition, coordination also made for enhanced supply reliability. A large system enabled a supplier in trouble to call on others for support, while when operating in isolation, the lack of connections to other stations meant that a production break-down necessarily would have adverse consequences. ¹⁹

As we have seen, steam power had no significant role in Norwegian electricity production. However, hydropower too has characteristics that make integration a useful route to follow. It is an outstandingly attractive power source, with one critical flaw: it is dependent on the forces of nature and therefore highly unpredictable. Water levels in river systems are very variable and nobody can forecast how much water will be flowing at any one time. True, the unpredictability can be reduced by building dams to store water, but this is not always possible. To protect the power stations wholly against fluctuations in rainfall is difficult. While warfare might interrupt the coal supply to a thermal generating station, one drought year might damage a waterpower station nearly as badly. Integration and collaboration between stations can reduce this vulnerability a great deal. It was especially advantageous to coordinate production between stations with and without water storage facilities, and also stations in areas with different rainfall patterns. This way, they offer each other mutual support at times of water shortages and also reach worthwhile synergies by exchanging power more systematically. In an extended system, one electricity company with an energy surplus – i.e., plenty of water – can sell its production to a company with a shortfall. This is preferable to letting the water flow unused into the sea, while another company fails to meet its customers' needs. Both partners gained by collaborating in such situations, which were not at all unusual.²⁰

Integration and collaboration meant that hydroelectricity producers could utilise their plant more effectively and at the same time enhance supply reliability. The benefits from coordination depended on a adequately structured distribution network, with a certain level of operational maturity. In Norway at around the time of WW1, only the central south-eastern region had the kind of system that made thinking along these lines realistic. The potential was great, however, because Østlandet contained

quite a number of large and medium-sized generating stations, some with storage dams, and some without. The storage facilities were found especially in association with the watercourses to the west of Oslo, while large stations without capacity to store water were in the main located along the Glomma river system to the east of the capital.

BRINGING THE STATE ON BOARD

In Østlandet, integration and collaboration offered great potential gains in efficiency, but by the end of the First World War there were still few signs of such coordination. The Ministry of Works (Arbeidsdepartement), which was the department of state with responsibility for the power sector, saw this as a good reason for beginning to take an immediate interest in these matters. There were those who argued that the value of coordinating was too great to leave its implementation to chance. The issues at stake were socially significant and hence it was the part of the remit of the state to step in and make coordination happen. Besides, this was of immediate relevance. The growing energy shortage towards the end of the war, acutely felt in industrialised Østlandet, meant that it was urgent to start utilising the existing production capability as effectively as possible.

The civil servants in the Ministry of Works had formed the view that the state must take the lead in the development of integration and collaboration. Part of their thinking was that the local authorities neither wished to be involved, nor had the capacity to guide the system in the desired direction. That the Østlandet power companies were not collaborating already was seen as an unequivocal manifestation of this inability. The Ministry concluded that insistence on local independence was the basic reason why integration into a cross-boundary system had been perceived as a threat to local self-sufficiency. Although integration and collaboration could bring advantages, one outcome could of course also be an unwanted dependence on others. The great majority of the local authorities had made self-sufficiency the cornerstone of electricity provision and the state had actively used this fact to create its power policy. Local independence had seemed capable of overruling all other ambitions and considerations. As new, more broad-based policies began to develop, it became questionable whether each local authority in the future could continue to act as master in its own house. Not any longer, according to the Ministry of Works. The men from the Ministry let it be known that more extensive and interventionist regulations were on the cards. One suggestion was that the state should be able to require electricity companies and generating stations to join and collaborate, whenever it seemed reasonable. Such views were brand new. Issuing directives to local authorities was not a widely used method of state governance, in this or any other areas.

However, the feeling in the Ministry of Works was that a more active engagement by

the state was needed to bring about collaboration and integration of local systems. For a start, integration could only be achieved after large investments in new transmission networks and related technologies. It was neither normal nor reasonable that single local authorities should carry such financial burdens. Also, joint plant management and other collaborative working required some form of overarching coordination. Both tasks, according to the Ministry of Works, were properly the responsibilities of the state. Besides, another consideration was that the state had to undertake the construction of large generating stations, which would be able to serve core functions in regionally coordinated networks. There were obvious problems attached to being the owner of a transmission system, without also owning sources of power production. At this point in the argument, several considerations merged. If the state were to create its integrated regional system of large generating stations and transmission systems, it would also have the potential capacity to supply inexpensive electricity to areas without usable hydropower sources. As has already been noted, this was a task that more and more people felt ought to be a special responsibility of the state.

THE NORE SYSTEM

Already before WW1, suggestions had been made to the effect that the state should handle the development of the large Nore falls in Buskerud, in state ownership since 1907. At the time, major and well-founded doubts had been expressed as to whether there was a need for the huge quantity of power that Nore would generate. Besides, it was an exceptionally costly project.

During the war years, many social landmarks changed. The old fear that to sell power would be problematic disappeared as a consequence of the massive growth in consumption, as well as of factors like the widening area of state intervention and the generally reduced constraints on state investment. When, finally, the idea of integration and coordination was accepted, it added yet another reason for developing the Nore falls. They appeared to be the most high-yielding in that part of the country, able to provide power at a very low cost. Also, the falls were well placed to form the core of a future regional electricity network.

Based on plans drawn up by the Watercourse Board (Vassdragsvesenet) and the Ministry of Works, the government was able to present a development proposal in 1918. The Nore station had a potential capacity of more than 220 MW, which would increase the Østlandet power supply by more than a third. The plans included bulk electricity transfers to large parts of the region. As well as distributing the Nore electricity, the transmission lines would serve as a shared network that also served the other regional generating stations. The vision was that Nore and the other large generating stations would be coordinated into a jointly managed system.

The time was right for a project of this kind. Despite the high cost, a majority voted for development. True, the plan was to carry out the construction programme in stages linked to the growth of consumption. But a large part of the work, including building the dams and the station itself, must be done at the first stage, expected to be complete in 1925.²¹

THE FOUNDING OF THE STATE WATERCOURSE AND ELECTRICITY BOARD (NVE)

Although the state had not undertaken any large power station projects before accepting the Nore plan, it already had wide-ranging competence in the field of watercourse management and electricity provision. This was true of the Watercourse Board in particular, with its wide management brief.²² In 1918, the relevant departments of state employed about 100 people, mainly engineers with diverse backgrounds, but there were additional professionals elsewhere in the state system.

In 1919, the Ministry of Works acted on a decision to bring together all civil service staff with training in professions related to watercourses and electrical power provision in one joint organisation. A future of new and heavy responsibilities lay ahead, not least with regard to the development of the Nore falls with its requirements for considerable expansion of both staff numbers and skills. The project was the context for a realisation of how important it was to coordinate knowledgeable people and manage them as efficiently as possible. The Storting supported the views of the Ministry and during 1920–21, the new organisation was founded and set to work. Its name was Statens vassdrags- og elektrisitetsvesen or NVE, i.e. the National Watercourse and Electricity Board.

With the NVE in place, the central institution in the state administration of the power sector had been established. Setting up the NVE was one expression of how, around 1920, the state took on more ambitious plans to exert control over electricity provision. The NVE was given the responsibility for all administrative issues related to watercourses and electricity. It was also charged with overseeing all aspects of construction and on-going management of the state-owned generating stations and transmission networks. As a result of such directives, the Board undertook a mixed brief, which entailed being an administrative department for the sector in its entirety, as well as the management organisation for the state-owned enterprise working within the sector.²³



AT THE CROSSROADS?

"The perturbations and lasting changes brought by catastrophes such as war result from forces that are strong enough to disrupt the momentum of systems." So writes the historian Thomas Hughes in his comparative work on the electricity supply in the USA, Germany and Great Britain. Hughes shows how WW1 cleared the way for thoroughgoing institutional changes in the electricity supply systems of these countries. In all cases that he discusses, regional systems had won the day, in principle and in reality. At this time and in these countries, large networks had increasingly seemed the most rational and the most forward-looking form of organisation. The established model, small-scale and based primarily on local initiative and ownership, was fading fast and becoming regarded as passé – that is, as a form of organisation which was no longer in tune with the technological and financial realities.

The new trends towards regionalisation in these countries caused major changes in the long-established structures of ownership and authority. A locality's right to self-determination was often undermined when its areas of electricity supply became integrated into a regionalised system. There were many instances of resistance to this process. But, as Hughes shows, there were technical and economic undercurrents, which as a rule turned out to be too powerful to navigate against. In the next chapter we will look more closely at the dawn of regionalisation in eastern Norway during the 1920s and what its consequences were. Was institutional change, with increased centralisation and weakened local control, the scenario that the citizens of Østlandet had to face, too?

Before the Norges vassdrags- og elektrisitetsvesen or NVE (Norwegian Watercourse and Electricity Board) was set up in 1920, watercourses and electricity supplies were admnistered by different departments of state, the most important of which was the Vassdragsvesen (Watercourse Board). This staff photograph was taken in 1910. Ingvar Kristensen, the Director, is number two from the left of the second row. Kristensen was an ardent supporter of strong and wide-ranging state involvement in the electricity sector.



Chapter 3 Setback

The decision that the state should take on an entrepreneurial role in the energy sector was taken at a time when the economic forecasts were quite bright, despite the war and its consequences. When it came to turning these plans into reality the outlook was much more depressing. In the autumn of 1920, the postwar economic downturn in Europe had gained momentum and gradually begun to affect Norway, too. During 1921, it became a full-blown crisis, with falling demand, bankruptcies, unemployment and collapsing banks. The instability was to last throughout the 1920s and 30s. For the electricity providers, the faltering economy meant that growth of current use slowed down and financial pressures increased dramatically, not least because of the need to service debts. The involvement of the state in power provision was also hit hard.

n present-day welfare societies, the state is expected to intervene actively at times of economic decline. It can raise the level of public investment, stimulate demand and help to maintain established enterprises. In the interwar years, these ideas had yet to become accepted practice. Instead, the dominant view in Norway, as well as in most other countries, was that when the economy was in poor shape and revenue declined, the state and its citizens alike should cut expenditure and save resources. And so it was: the parliament – the Storting – stuck to a tough policy of restraint during the 20s and 30s. The civil service was trimmed. High-cost projects, especially in the infrastructure sector, were postponed and existing state commitments examined much more critically. The fact that finances had been tight from the start of the crisis reinforced this prudent stance. In order to finance new undertakings during WW1, state borrowing had been increased sharply and this debt made the post-war position still less secure.

State engagement in power provision suffered. The declining growth of consumption hit the public providers as much as anyone, apparently proving that there simply was no market for the state-managed electricity supply. Both generating stations, Nore in the east and Glomfjord in the north, ran up major losses from the first, piling up more burdens for an already depleted treasury. The result was that electricity became another victim of the savings policy imposed by the Storting. In the long run, the whole wretched situation did its bit to ruin the reputation of the idea that the state should act as a power provider. By the mid–30s, the broad political consensus was that the state should back down from these commitments. Powerful voices were arguing that the time had come to sell the Nore station. The state department in charge of watercourses and electricity, the NVE, was subjected to severe scrutiny, in particular the section responsible for planning and construction of power stations. No one could miss the writing on the wall. At this point, the notion of the state as an electricity producer seemed ripe for writing off.

FROM POWER SHORTAGE AND OPTIMISM, TO EXCESS POWER AND DEPRESSION

The tremendous growth of electricity consumption during and just after WW1 was the immediate cause of a serious power shortfall (see Chapter 2). After 1920, the situation was reversed. Throughout the interwar years, Norway had a practically chronic excess of electricity. This was especially so in Østlandet, in the southeast. This was because of the weaker growth in demand as well as the vigorous investment in power stations and systems during the previous years. During the war, rapidly increasing demand had inspired great hopes for the future and triggered an avalanche of new projects for stations and transmission systems. But power stations take quite a long time to build

PREVIOUS PAGE: A private enterprise company started the construction of the Glomfjord power station in Nordland County, but the site and the plant were bought by the state in 1918 and the station completed in 1920 – just in time for the economic decline during the 20s. There were no buyers for the Glomfjord output and the whole venture added to the huge financial losses sustained by the state during the interwar years.

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and most of them started production in the early 20s, i.e., just when the demand was beginning to plateau. The country's production capacity actually increased by 50% during the 20s, a fact which to a large extent was due to the completion of stations initiated before the economic downturn.² The effect of the depression was reflected in seriously reduced growth of production capacity only in the 1930s. During that decade, growth increased by barely 20% and, besides, was a function mainly of expansion at existing stations. Hardly any larger stations, whether for industrial or general use, were built from scratch at this time.3

In summary: while previously, the consumers had fought to get their power needs met, after 1920 the companies had to fight to sell their electricity. Forced to rethink their sales strategy, the companies tried a range of methods to boost sales. Several companies launched new types of tariffs, structured to stimulate consumption. Other ideas included advertising, information and demonstrations, often intended specifically for households. Many of the power companies set up their own retail outlets, selling electrical goods

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at wholesale prices and offering tempting instalment plans. Also, their trade association coordinated bulk purchases of equipment and material, which made it easier to pressurise suppliers to lower their prices. The production sector also found this approach useful when confronting the newfound enthusiasm among the suppliers for forming cartels. However, the most important move was probably that the producers decided not to raise their unit charges, despite their increasing running costs. Since

New uses for electricity were invented throughout the interwar years. The photo shows the entrance to the editorial offices of Aftenposten, one of Norway's largest newspapers. Modern illumination was deliberately used by many enterprises for marketing and brand profiling purposes during this financially testing period.



Despite the hard times between the world wars, modernisation of the home carried on regardless. The new electrical devices became part of many households: one example was this electrical cooker. Cheap electricity and vigorous marketing efforts by many electricity companies drove this development forward.

electricity provision in Norway was defined primarily as a "social" enterprise, it seemed more proper to concentrate on trying to maximise takings by keeping prices low and turnover high, rather than raising prices and hence reducing turnover.⁶

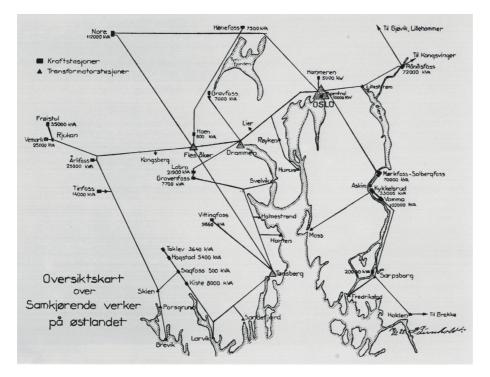
That public agencies should be driving consumption of goods is, to put it mildly, unusual. However, these were the interwar years and a period widely thought to be the time when modern consumer society had its breakthrough in Norway. Crucially, local authorities were the main power suppliers and also, through their sales efforts during these two decades, played a major part in accelerating the spread of domestic electrical appliances. People bought quite expensive "whiteware", such as cookers, hotplates and room-heaters, as well as gadgets from long list of cheaper equipment that included irons, kettles, waffle makers and curlers. Many of these items would no doubt have become popular without the electricity providers pushing sales, but surely the uptake wouldn't have been so fast and on such a scale. It is noteworthy that the electricity companies and power stations supported what amounted to nothing less than a social revolution. This was a time when electrical goods, more than any other kind, helped to improve the home as a place of work and leisure.8

LOCAL AUTHORITIES IN A DEBT CRISIS

Above all, it was the consumers who benefited by the "electrical revolution" – much more so than the providers of current flowing through the networks. True, the turnover of

the power industry increased overall, but the great majority of the companies were struggling to sell their electricity. The market-directed approach carried its own costs in the form of less income per traded kWh, but the most problematic aspect was that production costs could not be balanced by higher unit prices. There can be no doubt that, between the wars, most companies had to cope with dramatically increased costs. It was partly because many companies had run up large loans in order to make bold investments during the good times. Now they had to pay very heavily to service their debts. In the 20s, Norges Bank (the central bank of Norway) operated a monetary policy that targeted debtors in particular and hurt the local authorities, too. Their

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The local distribution networks in Østlandet became ever more closely linked in the 20s, which in turn allowed the development of "samkjøring" (coordination), i.e., power producers collaborated in order to utilise their output as efficiently as possible.

earlier habit of running up debt in order to invest, preferably in electricity provision, had landed them in serious trouble.

During the war and the immediate post-war years, the local authorities, as well as the state, went in for expansionist policies that were mainly financed by borrowing. Between 1914 and 1925, local government debt shot up from 223 million to an impressive 1.5 billion NOK. Much of this sum had been spent on procurements in electricity production and distribution. By the mid–20s, the sector accounted for more than half of the total debt. County councils had been the most dashing investors in electricity and this borrowing represented over 58% of their collective debt. Town and city councils had meanwhile run up electricity investments amounting to around 40% of all their debt-funded spending. 10

Many local authorities had lumbered themselves with wartime power projects, which were badly thought out, both in respect to technology and of finance. While the majority of course had been reasonably sensible in the circumstances, they too were undermined by the downturn. Slowing demand and more expensive debt added up, and many power companies ran at quite a large loss. Estimates from 1925 indicate that power provision only earned sufficient profit to service about 75% of the accumulated debt. Things went especially badly in the country districts, and their liquidity problems often infiltrated the entire local budget. By 1930, every third local authority was unable to meet the required payments and therefore technically bankrupt. In addition,



The central coordinating unit in Oslo, which started up in 1928. It coordinated generator outputs and exchange trade in power between the regional Østlandet companies. The centre was built and initially run jointly by agreement between the state and capital city's own electricity company. In 1932, the companies established their own organisation to manage coordination and called it Foreningen Samkjøringen (Coordination Board).

a large number of councils that had just managed to keep afloat were struggling to do so. Although it couldn't be said that electricity alone caused the debt crisis, it was certainly the one sector that contributed most to it.

THE ELECTRICITY NO ONE WANTED

The sales problems, combined with the economic crisis affecting local electricity supplies in general, had negative effects on state provision as well. After all, the idea had been to sell power produced by the state in the first hand to local authority-run stations and companies. But why should they want to buy electricity at a time when they were already more than well supplied? Indeed, hardly anyone did. The result was that the state found itself landed in deeper trouble than many of its local government counterparts. While the local supplier had a monopoly in the area and could be assured

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of at least a respectable turnover, the state was in the position of a wholesaler, lacking directly dependent customers and at the mercy of local decision makers.

In 1925, when NVE invited councillors from the eastern region of Østlandet to negotiate purchases of power quotas from the Nore station, things did not yet look too grim. At this point in time, some people expected the economy to start improving. The negotiations in fact ended with four agreed contracts, securing an agreement on a total of 43 MW.¹¹ NVE presumably counted on more companies signing up before 1928, when the Nore station was due to come on stream. Anyway, it planned to fire up four turbines, together generating 108 MW, which corresponded to just under half of the station's total capacity.

Hope is a fine thing. The year of signing the first Nore contract was also the year when the central bank launched its so-called "paripolitikk" – i.e., bringing the Norwegian krone back to parity with its pre-war value on the international currency market. It entailed a stringent monetary policy, which soon resulted in sharply increasing levels of debt and a new, swift economic downturn. By then, very few companies were willing to risk binding, long-term power contracts with the state. A glimmer of light at the end of the tunnel appeared first towards the end of the 20s. Next, in 1930, the worldwide depression reached Norway and prolonged its internal crisis. For electricity providers at the local level, the severe recession meant that the poor growth in demand continued. For the state, the knock-on effect was catastrophic. The Nore output stagnated and only started to increase towards the end of the 30s. During an entire decade, perhaps the most splendid hydroelectric station in the country worked at a quarter of its capacity and went ever more deeply into the red.

BATTLES FOR POWER AND FOR CONTRACTS

As if all this wasn't bad enough, the state also ended up locked in a major battle against the companies about the enforceability of the Nore purchasing agreements. The conflict had its roots in the disquiet among most of the contracted customers, who felt that the state had loaded another burden on their backs. The demand for electricity wasn't increasing at the rate expected back in 1925, and now the unwilling customers were expected to pay heavily for power they couldn't sell. The Nore contracts had included a clause that required buyers to pay a recurring annual fee, irrespective of any bulk purchases to meet consumption requirements. The customers insisted that this fee should be reduced, and justified it by pointing out that the original charge seemed unreasonably high in comparison with prices in general, which had fallen steeply since 1925. Also, they had an additional *casus belli*. They wanted the right to sell the power from Nore on to other companies. It meant a bad deal for the state, which would miss out on potential new customers.

The battles continued right through to 1938, the year the contracts terminated. Even though the state was safe enough in purely legal terms, in many other ways it ended up on the losing side. Within the sector, the sympathies tended to be with the opponents of the state. This was not all that surprising. The prevailing view was that the state shouldn't add to the financial distress of local government. Besides, a matter of principle was at stake: where to draw the dividing line between the executive authority of respectively the state and the rest of the sector, i.e., the local electricity companies? The importance of the local electricity provision was another factor that made it harder to feel positive about state intervention. One outcome of the conflict was that, by the end of the 1920s, the local power companies in Østlandet quietly joined forces in order to put a spoke in the wheel of the state. Paradoxically, this alliance had been made possible by the state itself. It had encouraged integration and coordination of the region's power stations and also provided the means by constructing the large Nore transmission systems.

AN ALLIANCE AGAINST THE STATE

We observed previously (Chapter 2) that, around 1920, the state was eager to promote the integration of transmission systems and the joint running of power stations, if necessary by enforceable orders. The sector had resisted these intentions strongly. Typically, it was regarded as improper interference in the tradition of local self-government. It was also pointed out that directives and dictates were contrary to the very nature of fruitful collaboration. The Ministry of Works seemed impervious to these objections. For instance, from 1920 onwards the Ministry began to include clauses concerning statutory coordination in certain concessions for large power producers. ¹²

In the Østlandet region, where the regulatory efforts of the state were particularly intense, its attitude caused an interesting counter-reaction. The largest local authorities joined to establish coordination of supplies in 1922. To some extent, this move must have been driven by recognition that a joint operation could be truly useful. But, above all, the initiative was an attempt to steal a march on the state. It would weaken the arguments for strict regulation if the power producers proved themselves willing and able to collaborate voluntarily – and would leave them in control of future developments. Their strategy appeared to win the day. At least, the Ministry of Works gradually shelved its more ambitious regulatory plans. ¹³

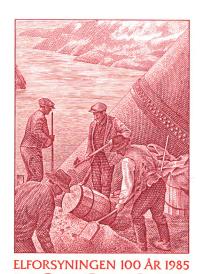
Initially, the coordination initiative seemed a little insubstantial. During the 20s, there were only one-off agreements between the companies to swap power. Doubts about the basic idea had something to do with this caution, but wasn't the only factor. One serious obstacle to coordination was the lack of an effective transmission network. This changed in 1928, when the Nore station was up and running, complete



with its new power lines. Many local, previously isolated districts were now able to connect to a main supply, which made more extensive coordination possible. This, as we know, had been one of the intentions behind creating the system in the first place. The network soon became used in coordination projects, not only serving the state production, but also all interested producers within range. Joint working took off, especially after 1930. By 1933, the development had advanced to the point where the companies wanted to formalise it. They organised themselves into the so-called "Foreningen Samkjøringen" – the coordinating group – which was the first of its kind in Norway. The group undertook to be responsible for coordination and see to it that the collaboration between the members was as wide-ranging as possible. The aim was to exploit all aspects of the system.

From the point of view of the state, it was progress as planned, in a way – but, ironically, successful coordination was contrary to its interests as a *power producer*. The result was indeed exactly what everyone had hoped for: power stations were used

Construction of pipelines to Glomfjord power station in Nordland, which had been bought by the state in 1918. It was no easy task to work with the heavy steel pipes in this landscape. This approach to pipeline and power station construction practically came to an end by the end of WW2. By now, the original Glomfjord station and its feeder pipes have been decommissioned and the complex designated an industrial heritage site. A new installation has been built on a mountainside nearby.



When the centenary of Norway's electricity supply was celebrated in 1985, the Glomfjord pipelines were honoured: they are illustrated on this celebratory stamp.

more rationally. But, it followed that the need for state power provision was reduced. And, as importantly, joint working made it possible for the companies to coordinate their activities specifically to avoid trading with the state. The strategy they focused on was to integrate their individual requirements. As early as 1929, the producers entered into an informal agreement never to buy from the state, unless the partners could not make extra power available. This practice continued well into the 30s and had farreaching consequences for the state. Through such collaborative actions, and with the help of the state's new transmission network, the companies managed to hold back the influx into the system of state power. The companies contracted to buy from Nore gained more than the others from this strategy. Even though state regulations stated that Nore power must not be sold on to other clients, this was in fact what happened. The sellers were companies with large production capabilities. How to prove it was Nore power, rather than the home-produced variety, that flowed along the lines? It was actually impossible.

A FAILED PROJECT?

It is hard to imagine a worse beginning for state involvement in power generation. Neither Nore nor Glomfjord brought in earnings that were nearly enough to make up for the construction costs, but instead gobbled up whatever money the already hard-pressed treasury could afford. In 1938, Olaf Rogstad, the managing director of NVE for most of this period, estimated that losses incurred by its power production venture amounted to about 35 million NOK. ¹⁵ In terms of the present value of the krone, this is well over one billion, or about one hundred million NOK annually.

Naturally, the loss-making enterprises compromised the entire state engagement in electricity production. Its other activities also came to look increasingly superfluous as time went by. Given the way the situation had been developing between the wars, state participation seemed unjustified. The local authorities found it troublesome enough to find buyers for their own product. The slow market damaged the prospects for what the Storting, the Ministry of Works and the NVE had envisaged as Nore's chief function: serving as the crankshaft of power provision in the east. Also, it did not appear well placed to fulfil the aim of equalising distribution. It was the relatively large, central companies which entered into agreements with the state, rather than the poorly supplied counties or regions. Only a small proportion of the state electricity output reached outlying districts. Supplies to several of the most sparsely populated eastern counties failed to meet their needs and some areas received hardly any current. The state cannot be held directly responsible, because many deprived localities had been unable to put adequate distribution systems in place. Nonetheless, lack of supply was often seen as proof of the failure of the state as power producer: it hadn't met one of its crucial obligations.

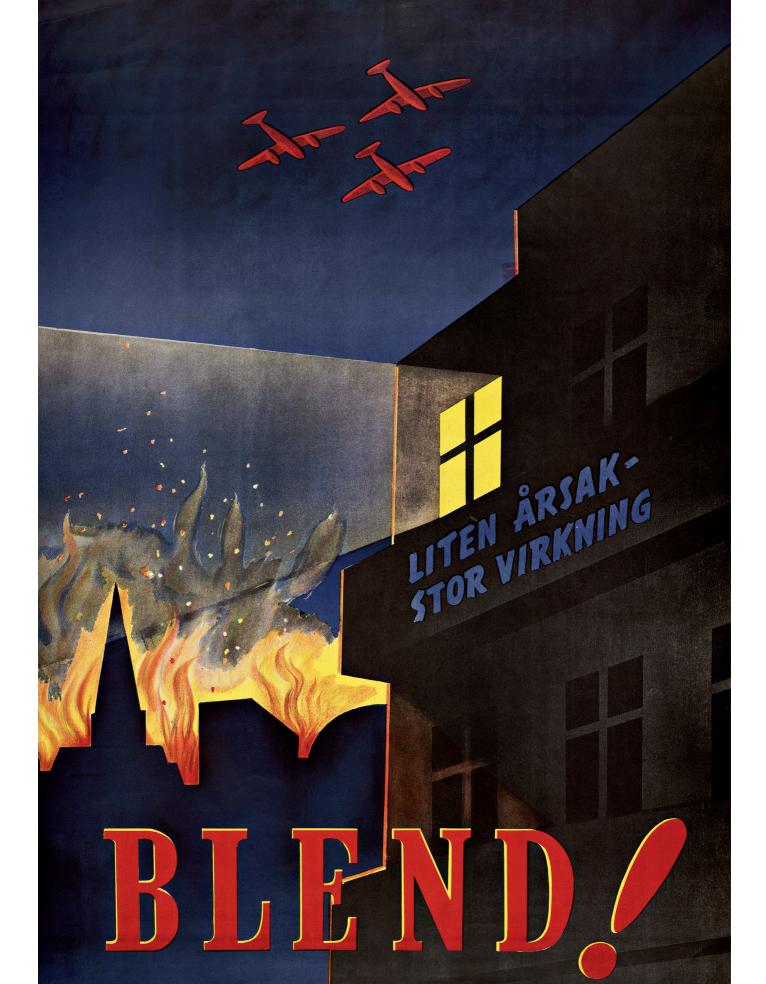
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Yet another development undermined the role of the state: the local companies ably handled the task of collaboration, which had been originally seen as a state prerogative. Of course, the flow of power from Nore was a precondition for their working smoothly together. Even so, the state had contributed little to any stage of the creation, organisation, funding and management of coordination.

This combination of circumstances had devastating effects on the political legitimacy of state involvement in power production. During the early 1930s, powerful voices within the eastern region electricity business argued that the Nore generating station should be sold. One group of the larger companies had suggested this outcome already in the 20s and, over the decade that followed, support for the idea spread. There were influential people in the Ministry of Works and the Storting who agreed. In 1936, Ministry of Works delivered a proposal to the Storting, which opened the way for a sale of the Nore station and its transmission system. The Ministry even went as far as initiating negotiations about a deal along these lines with a group of the largest power companies in the region. Generally, the consensus was in favour of the local authorities having a lead role in the provision of the regional electricity supply.¹⁷

However, the sale of Nore never took place. An issue of practice arose which blocked the whole transaction: the would-be buyers set conditions that were unacceptable to the state. Besides, there were arguments in favour of continued state ownership of Nore, put forward in particular by representatives of the more distant localities. It was felt that they would in fact be better served if Nore were to be retained by the state, even though they so far had seen little of the supposed advantages. But should the station fall into the hands of one of the large, central authorities, they felt that they still wouldn't benefit. One particular fear was that the Big Brother himself, Oslo Elektrisitetsverk, would gain a much too dominant role in the region if it acquired ownership of Nore. Oslo Elektrisitetsverk had been leading the group, which was negotiating a possible purchase with the state. In fact, a deal was unlikely without the active participation of the well-capitalised Oslo Elektrisitetsverk.

It was probably also relevant that this was when the bad times were almost at an end. If Norway had been harder hit by the economic recession during the 1920s than most other countries, at the end of the depression years, its recovery was faster than most. As early as 1933, the graph began to point upwards. By 1935, power consumption in the eastern region was rising really fast. This had a positive effect on the Nore situation as well. Former Nore customers began to buy up more of their contractual quotas, which looked like a sign of better times. During the years to come, these expectations were met. By 1937, the Nore turbines were working at close to full capacity and, in 1938, the Storting agreed to the installation of a new turbine. When WW2 began, it brought about large increases in electricity consumption. In 1945, as the war ended, Nore was working at the limit of its capacity.



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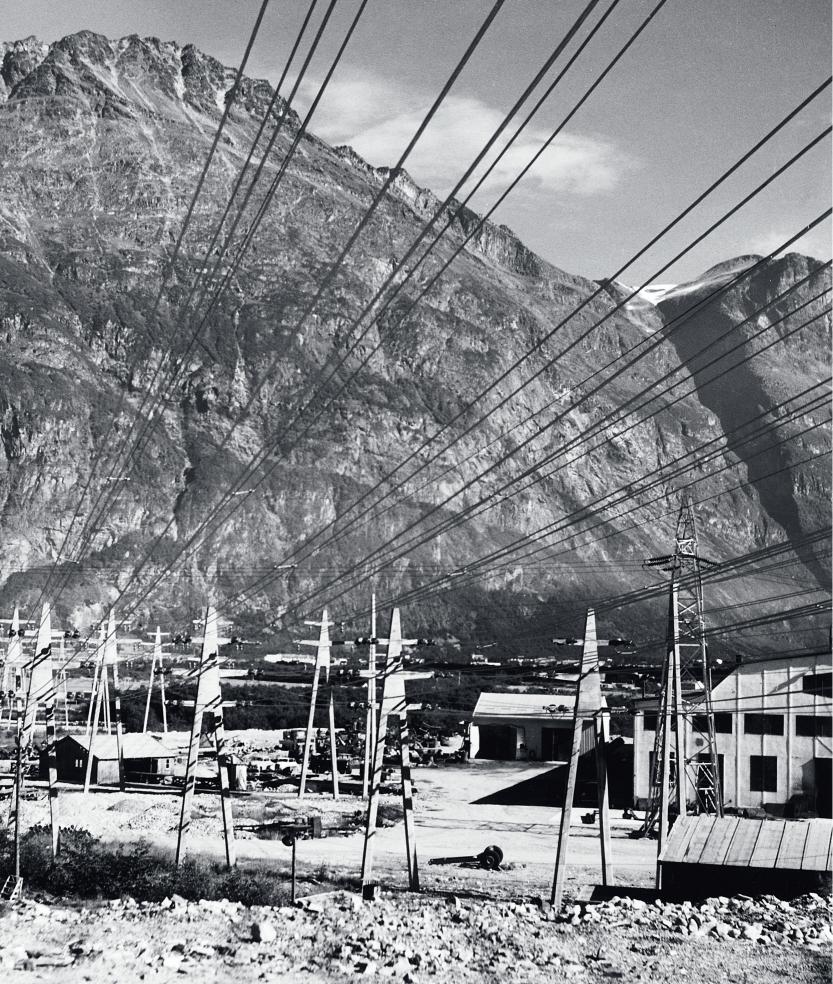
CONSOLIDATION OF THE LOCALISED MODEL

That Nore remained in state ownership indicated that there was after all some support for state involvement in power production, although the great ambitions from the second decade of the century never revived. Even as late as the mid–40s, as WW2 was coming to an end, there was hardly anyone inside the established energy civil service who backed the view that the state should once more engage itself in grand projects. Even NVE staff showed no taste for anything of the sort. And perhaps it shouldn't surprise us. During nearly two decades, running power stations had caused chronic headaches and sapped the motivation of leadership and employees alike.

The retreat of the state had contributed to the consolidation of the existing organisation. The local authorities had been in a strong position already from the outset. Had the good times continued, the state might well have created a major position for itself as a producer, as well as a regulatory agency. State success would probably have come at the cost of local involvement: its ambitions, as expressed at the start of the 1920s, suggested this. It would also have been in line with international developments. During the interwar years, the state's position in the area of electricity provision was strengthened in several countries. But it didn't happen in Norway. Instead the state withdrew, or so it seemed, allowing local authorities to keep the business they had acquired during the early stages of electrification. This is how the Norwegian electricity supply came to be an exception in several ways. Would the state have become the dominant agency in the 20s and 30s, if the economic crisis had not arrived when it did? It is hard to say. What we do know, however, is that after 1945, the process of active state engagement in power production sprang back into life. This revival is the theme of the next section, which begins with a chapter on the responsibilities of the state for industrial growth and public welfare. 19

Part II

Expansion and Consolidation (ca. 1945–1985)



Chapter 4

Building industry and welfare

In 1947, the Storting (the Norwegian parliament) backed the construction of two large, state-owned hydroelectric stations: Røssåga in Nordland County in the north and Aura in Møre og Romsdal County further to the south. The two projects initiated a new era of state engagement in power production. In the first instance, it was a novelty to have the state playing such a dominant role in the sector. Its remarkably active construction policy during the couple of decades that followed 1945 was to make the state by far the largest power producer in the country. It was also taking on other tasks in the area of electricity provision, which previously hadn't been regarded as part of its function. Notably, the state now started to supply power to heavy industries on favourable conditions. Its traditional core function was to supply the general public but, after 1945, the industrial sector expanded and the state became its major supplier of power. This fact was also actively used in its promotion of new heavy industries. The Arbeiderparti (Labour Party) dominated the political scene in Norway after WW2 and took the lead in grand power station projects suited its economic goals, which relied on a strong industrial sector. By the mid-6os, almost half of the total production by state-owned stations was earmarked for use by big industrial plant and guaranteed in long-term contracts.

ut while the state went off in new directions, it didn't mean leaving old obligations behind. Provision for the general public also grew strongly, and, in many areas of the country, the state became a key supplier to local electricity companies. This happened in particular in the north, where many households still had no access to electricity by the end of WW2. It was not least due to the efforts of the state that this part of the country became adequately supplied with electricity in the course of the 50s. To summarise: the state engagement in power production served effectively to promote its industrial policies as well as providing social benefits.

A NEW POLICY FOR HEAVY INDUSTRY

To begin with, let us take a closer look at the new policy: why did the Arbeiderparti spend considerable state resources on constructing new power stations dedicated to serving big industries? The answer is found in the interwar year debates, when the party thought afresh about manufacturing industry and its stimulating effect on economic growth

Traditionally, the labour movement and the Arbeiderparti had been preoccupied by the *distribution* of social assets, rather than focusing on the theme of how that nation's wealth was to be *created*. The party's goal was to ensure that the working class, which contributed to making the national cake, should receive a larger share. However, the emphasis shifted in the course of the 30s and some groups within the labour movement took onboard ideas about economic growth. This was natural enough: the more growth, the larger share for everyone. Also, the working class was gaining greater political leverage at this time and with it acquiring brand-new opportunities to influence distribution. Among the theoreticians in the policy planning unit it was widely held that the shape of economic development must not left to market forces alone: if the effects of growth were to be maximised, direction was essential and the directives should issue from the state. It had to divert society's productive potential – its capital, technological and labour resources – into the sectors and trades, which were likely to produce the best results relative to the size of the labour-force.¹

This was how heavy industry came to be central to socialist growth policy. For surely no one could imagine more efficient systems for mass production than the huge conglomerates taking the stage in advanced industrial countries such as Germany and the USA? The industrial giants that had emerged in America since the turn of the century were singled out for interest and awe. The party cadres were hardly likely to be all that enamoured with all things American, but the industries were outstandingly productive and efficient. It followed that large industrial enterprises, with their tremendous capacity to generate national wealth, could benefit everyone, given that

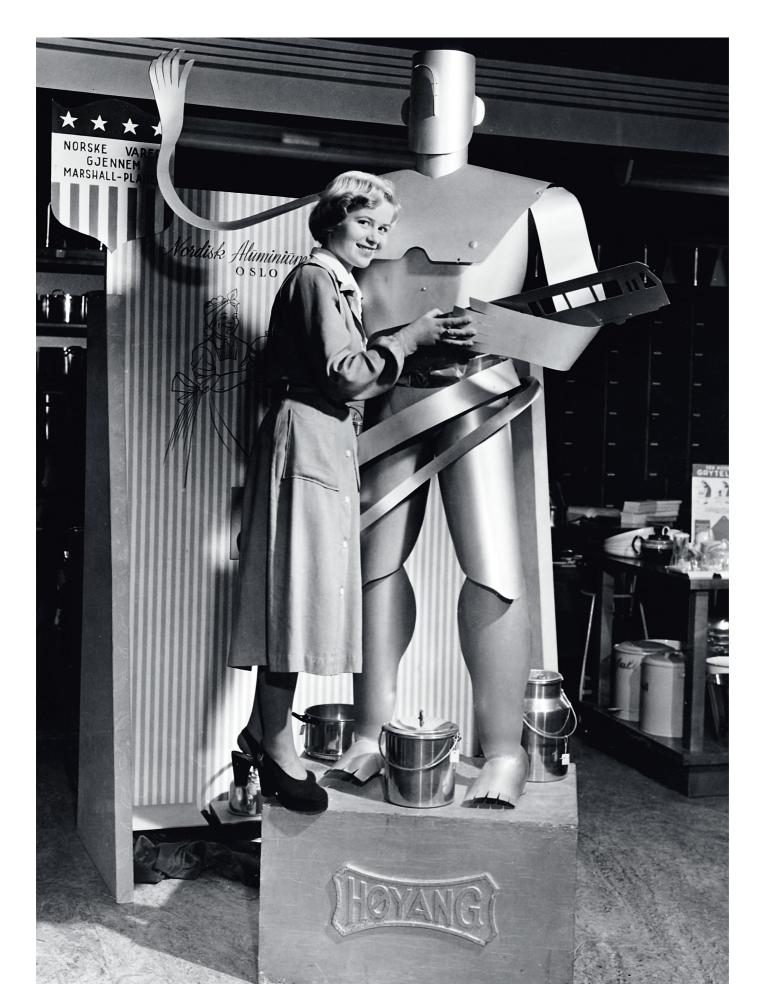
PREVIOUS PAGE: The power lines from the Aura generating station to the Sunndalsøra aluminium smelter in Møre og Romsdal County. This industrial complex, which started up in 1953, symbolised a new era and a new kind of state participation in the electricity sector. After 1945, the state actively supported the expansion of heavy industry in Norway, emphasising the country's very considerable hydropower potential as the essential resource. In 1953, its start-up year, Aura was Norway's largest power station and one of the first state-owned stations wholly or partly dedicated to providing electricity for heavy industry.



they were under *socially appropriate control*. In other words, industry-led growth was a prospect that didn't only attract capitalists and apologists of capital, but also, and to a remarkable degree, socialist planners, philosophers and politicians.² The prime example of this is the Soviet Union, where the communist regime had actively tried to import models of industrial organisation from the United States, since the 1920s.

During the 30s, planning for extensive growth of big industry in Norway appeared to be little more than a utopian exercise. Situated near the margin of the international economy, the country was also short of both people and money. It could hardly expect to raise the finance for large, capital-intensive projects like big power stations and industrial plants. Besides, industries would have to grow exclusively on the basis of exports, since the Norwegian market for products was likely to be too small in almost every case. In the 30s, the international market was an uninviting place, haunted

The Norwegian authorities invested especially heavily in projects involving aluminium production. In the post-war years, the metal seemed one of the materials of the future and, among other uses, was crucial for modern aeroplane construction.



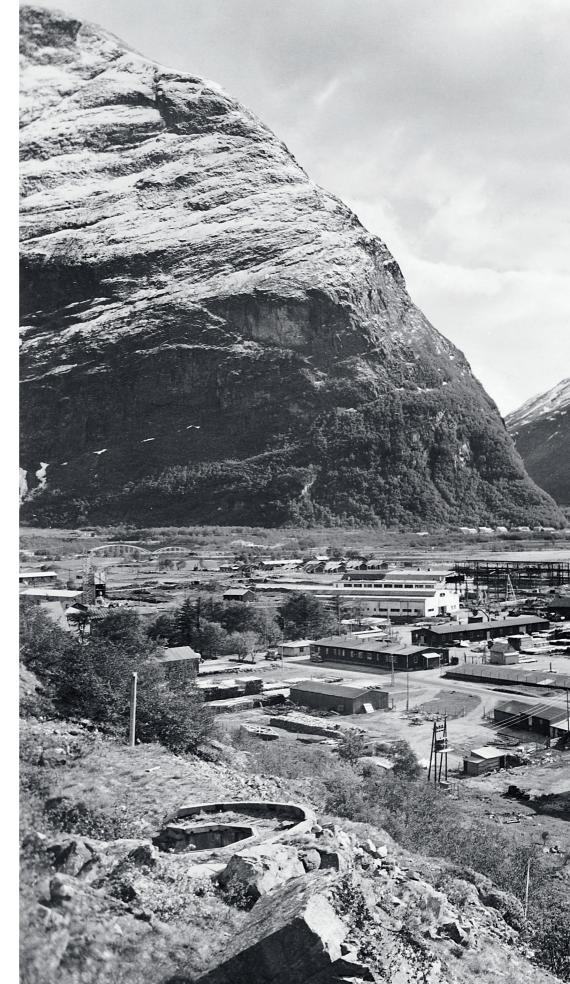
by economic depression, low levels of trade and increased protectionism. This had already hit industry in general, not least the Norwegian power-dependent industry, which had barely been ticking over during most of the 20s.³ In addition, attitudes inside the socialist Arbeiderparti were not at all wholly in favour of large industries. The powerful rural socialists, sceptical about big industry and extensive industrialisation in general, formed one such oppositional group within the party.

NEW OPTIONS FOR EXPANDING BIG INDUSTRY

But time did not stand still. After 1945, the economic and political state of the nation was changing, as did the power balance inside the Arbeiderparti. As a result, the vision of "big industry" appeared both more realistic and within reach. Young, "progressively-minded" activists exerted considerable influence both within the party and the government. As politicians, they believed strongly in planning and directive policies and their beliefs were matched by their far-reaching willingness to use the state in order to achieve the party's economic ambitions. The Arbeiderparti's majority in the Storting provided them with new opportunities to realise their policy objectives. The economic upturn also helped. Many had expected a recession to follow the last world war, like the previous one. However, it didn't happen. In the period after 1945, Norway, like most Western countries, experienced better growth than at any other time in contemporary history. The economic upswing also helped to improve the situation of the state. Internationally, the post-war economy and politics also offered immediate advantages to the dynamic, power-dependent industries in Norway.

The last observation is based on two circumstances in particular. One was that the reconstruction of Europe brought with it a huge need for power-intensive products, notably various metals. Existing plants could not meet the demand sufficiently. The other factor that favoured the Arbeiderparti's industrial vision was Marshall Aid, the grandiose financial plan launched by the USA to support European reconstruction. The United States' administration put great emphasis on the Marshall Aid programme being managed so that effect on the totality of the European economy would be maximised. One outcome was that funds were made available to recipient countries according to their specific production capacities. 4 This suited Norway's ambitions for growth very well. While access to energy was problematic for most European countries, it didn't trouble Norway. Indeed, if any one country was to be seen as an outstanding natural centre for power-hungry industry, the choice had to be Norway. Or, in the words of one of the industrial policy experts in the Arbeiderparti, speaking in connection with the Marshall Plan in 1948: "In all of the European economies, it is hard to envisage any area for capital investment with more potential for profit than the combination of hydropower and heavy industry in Norway."5

OPPOSITE PAGE: After the war, aluminium was also increasingly used for products by light industry, often aimed at households.



A new, industrial town: the photo from 1953 shows Sunndalsøra in Møre og Romsdal County. The local aluminium smelter was the main trigger for the dramatic transformation during the 50s of this quiet rural area into modern urban community.



Clearly, Norway was on to a good thing. Its representatives lobbied strongly for finance to build power-dependent industries between 1948 and 1950, as the details of the Marshall Aid programme and the distribution of grants were being hammered out. The American administrators were very sympathetic. The Norwegians found that their arguments were actively encouraged. This however did not necessarily mean that the decisions went their way. In this sector, other countries in Europe with similar industrial claims felt challenged by high prioritisation of Norway. France, Italy and Switzerland were among those who tried hard to curb Norwegian ambitions. Of course, with several of the larger, more influential European countries threatening to block the negotiations, the Americans couldn't insist on favouring Norway.⁶

All the same, there was plenty of American finance supporting new heavy industry being established in Norway. In 1950, the two countries began a separate round of negotiations aimed at determining the grants and loans required to fund a large, state-owned aluminium smelter near the town of Sunndalsøra in Møre og Romsdal County, and also the development of a hydropower supply to the aluminium plant from the nearby Aura watercourse. A contract was signed in the spring of 1951 and production started two years later. The Americans agreed to back the project because it would support the wider European economy, but also serve the interests of the USA. The outbreak of the Korean War in 1950 meant that the US authorities had to ensure aluminium supplies for military equipment. This requirement paved the way for the decisions to provide a loan to back the construction of the smelter and a contract for regular deliveries of Norwegian aluminium. The deal went ahead. It included a clause specifying that a large proportion of the loan was to be repaid in aluminium over a ten-year period.⁷

It might be thought a little paradoxical that the USA should have made possible the construction of the Sunndalsøra hydropower and industrial plant, which were to be owned by the Norwegian state. It was not the only enterprise established under the aegis of the state during this period. Another aluminium smelter – Årdal in Vestlandet, the west-coast province – also started up under state management. The events leading up to the Årdal decision differed from the Sunndalsøra process. The plant was inherited from the Germans, who during WW2 had attempted to expand aluminium production in Norway. In Årdal, the Germans came closest to their goal: the plant was almost ready to come on stream at the time of the 1945 peace treaty. The decision to take over the smelter and its power station at Tyin was taken by the Norwegian state in 1946. During this period, a third state-owned heavy industry was created in the Norsk jernverk (Norwegian Steel Works) in northern Norway. It was the outcome of a policy to create national self-sufficiency in steel. A supply of steel is a strategic priority of modern industry and the world wars had demonstrated how dangerous it could be to lack internal capacity to produce this important commodity. In

OPPOSITE PAGE: Aluminium bars being loaded for shipping from Årdal in Sogn og Fjordane County in the 1960s. Årdal was one of the communities in Vestlandet, which became linked to the international trade as big factories were built there after 1945.

1947, the state had acquired from the Germans a crucial share holding in Norsk Hydro, the largest private industrial corporation in the country and so came to hold a substantial share of its equity. Norsk Hydro was one of the biggest producers of synthetic fertilisers in the world and had also diversified into other areas, including aluminium production. Through these investments in shares and in production capacity, the state became the largest industrial proprietor in Norway, a position which it has retained during the main part of the postwar years and until the present day.

A PRAGMATIC POLICY ON OWNERSHIP

Clearly, there were ideological motives behind the government's drive to engage widely in heavy industry. The Arbeiderparti wanted to ensure social control of the economy and state ownership was an effective way of going about it. Still, it must be emphasised that the party in most cases was not at all hostile to private enterprise. This became clear, in particular during the 50s, when the party stepped up its efforts to involve private capital in further expansion of heavy industry. In many respects, the Arbeiderparti demonstrably took a pragmatic view of ownership, as was seen at a quite early stage in connection with the aluminium project in Sunndalsøra. Before the USA entered the planning process as a possible source of funding, the party's industrial strategists had already been working for years to recruit foreign private capital to start up business in Sunndalsøra. Among other attractions, they tempted with cheap state power. Alcan, the huge Canadian aluminium corporation, was one of the negotiation partners. True, favouring the company was hardly the government's preferred ideological option.



On the other hand, the question of ownership was in effect secondary to the goal of actively utilising hydropower to run heavy industries. The talks with Alcan actually went quite far and stalled only when Marshall Aid and later the American initiative made state ownership possible.

This pragmatism in matters of who owned what was still more in evidence during the course of the 50s. The social democratic Arbeiderparti government began to encourage established privately owned companies, such as the aluminium producer Elkem, to expand their activities. Elkem was courted and among other things offered tax concessions. It was even promised rights to state-owned waterfalls in northern Norway, if only it would agree to set up a factory there. During the years around 1960, recognition of private ownership took yet another form as the state ran an upbeat campaign to tempt foreign aluminium producers to Norway. At that point, the plan was to utilise the large state-owned waterfalls in the west. A Norwegian who had become an international celebrity was persuaded to lead the campaign: Trygve Lie, the first Secretary-General of the United Nations. Especially by virtue of his former position, Lie had an unrivalled, worldwide network of contacts. He was very successful as a "venture capital ambassador": during the 60s, three new aluminium works opened in western Norway. 10

This pragmatic attitude to private and foreign capital investments in heavy industry is in line with the widely accepted view on the historical development of the Arbeiderparti, which interprets its policy on industry as focused on growth, and only secondarily inspired by political ideology. Economic growth was its overriding priority and state ownership was a means to that end rather than a goal in its own right. The role of the state should in the first hand be to make it easier for private enterprise. If a company was in trouble, or failed to measure up to growth targets or specific political directives, it was up to the state to move in. As some commentators have put it, above all the state's function was that of a "substitute capitalist".

The state-directed drive to build hydropower stations can be seen from this perspective – at least from some angles. Until the end of the 60s, many of these large projects were driven mainly by aim of providing generous conditions for heavy industry, rather than by the idea that power stations had to be state-owned at any cost. The law on real estate concessions in any case ensured that the state had considerable control over the nation's hydropower resources. Also, industries tended to regard it as advantageous to buy power from the state, rather than building their own generating stations. The realistic conclusion must probably be that to offer state-owned power, in addition to other actual or future goodies, was part of the necessary conditions for attracting foreign capital to Norway.



THE STATE AND THE "DARK" AREAS

Previously, we have noted that during the time leading up to WW2, the rapid spread of a public electricity supply was mainly due to the commitment of the local authorities. However, the national average figures were hiding large regional and local differences. Many areas had failed to raise the funds required for construction of electricity generation and transmission. This was true especially of scattered communities in the western and northern parts of the country. Even as late as the end of WW2, large areas were still wholly or partially "dark". By 1945, more than 600,000 citizens still lacked a domestic current supply and even in the densely populated eastern region, where electricity was most adequately provided, there were marked discrepancies in supply between the central and peripheral districts. 14

Before the war, such differences were of course thought undesirable, but were accepted all the same. After 1945, this changed fundamentally. By then, a household supply was almost seen as a basic human right. The "dark areas", as they were often called, now moved to the top of the political agenda. Electricity was to make a vital contribution to creating an equal society, improving standards of living and generally modernising the country. To provide "outlying areas" with electricity was a post-war goal, which was given additional impetus by the new, interventionist regional policy. It was agreed across the political spectrum that it was right to maintain traditional

"One isolated farm gets electricity – 1,500 watts cost 100,000 NOK " was the headline in the magazine Aktuell in 1968. In post-war Norway, a domestic electricity supply was regarded as almost a basic human right that should be provided also in places very far from the beaten track – like this family home in a remote corner of Sogn og Fjordane County.



Blasting the inlet tunnel at Innset power station in Troms County. The state built Innset during the late 50s in order to support the electrification of the northernmost part of Norway, where electricity distribution was less advanced than in most other parts of the country.

patterns of habitation and to support communities through an active drive to develop and innovate. Everyone, wherever he or she lived, should have a chance to create a personal version of a modern lifestyle. It meant that an up-to-date supply of electricity mattered critically. Indeed, access to electricity would, according to a widely held view, increasingly come to affect the population pattern as a whole.

Above all, it was the social democratic Arbeiderparti which insisted on taking electricity to the dark areas and made generous budgetary provisions to this end throughout the 50s. But this goal received practically general approval: from time to time, other parties would announce that even bigger sums should be spent. In the early post-war period, electrification was one of the policies with the most united political backing. Local authorities and electricity companies received state support in the form of either grants or loans to subsidise the construction of power stations, distribution networks and transmission lines. During the 1950s, more than 400 million NOK were paid out. The money was made available through the State Aid Fund, which the NVE managed mainly for the benefit of the counties in western and northern Norway. This arrangement continued for the lifetime of the fund, which lasted until around 1990. Of the total allocated during this period, approximately 2.3 billion NOK, more than three-quarters were spent in the west and the north.15

Perhaps just as important was the fact that the state increased its own investment in power stations and transmission lines. The north gained the most in this case, too, at least if measured in terms of money spent per head of population. Of the extra state installations set up during the twenty-year period 1945–65, close to half were located in the three north-

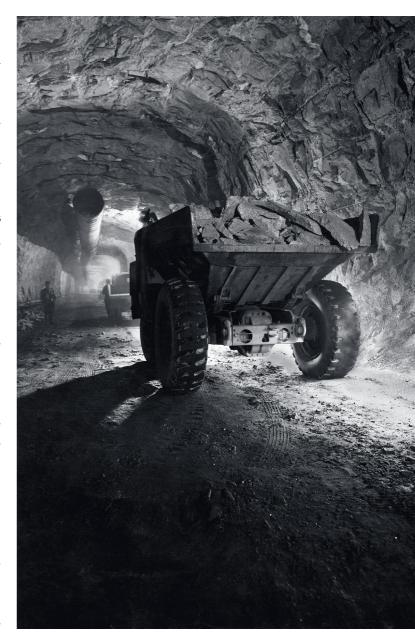
ernmost counties. Around half of the new northern power production was actually used to supply heavy industry on long-term contracts. However, it didn't change the fact that the state construction programme was crucial to the public supply in this region. By the mid–60s, state-owned power stations generated roughly half of total electricity consumption in the public supply sector.

UNDERDEVELOPED REGIONS GET A NATIONAL UPLIFT

The commitment of the state made an essential contribution to raising the low levels of electrification in some areas to parity with the central regions of the country. The local authorities, by now benefiting from good times, were accumulating independent assets and were therefore better able to fund new developments. These combined efforts had impressive results. Of the approximately 600,000 Norwegians lacking a household electricity supply by the end of WW2, fewer than 45,000 people were still without ten years later. They tended to live the furthest away from other human habitation – on islands, high up in the mountains or in isolated valleys. But during the following decade, the power lines were extended even to these homes and not infrequently at tremendous expense.

In practical terms, the nation-wide electrification represented a considerable transfer of resources from the central regions to the periphery. Most of the State Aid Fund came out of the national budget - the taxpayers footed the bill. A charge on all central electricity provision was also used to finance part of the aid programme. Still, several areas were exempt from the charge, which meant that some of the central regions carried a relatively much heavier burden. At the end of the 40s, the Storting had furthermore agreed that the cost of state power would be the same everywhere. The outcome of this was that the older power stations whose construction costs had more or less been paid off, like Nore in the wellsupplied Østlandet, ended up partly subsidising new power stations in far-away places. Besides, it was more expensive to deliver electricity in sparsely populated areas. The electrification of every community is a remarkable example of

geographical cross-subsidy. Even so, this policy met with general approval, with the possible exception of individuals who objected to the charges. All in all, the state support of electrification was a clear manifestation of the key role played by regional politics in post-war Norway. At the time, this aspect of Norwegian politics appears to have been quite distinctive. In Sweden, for instance, there was rather less emphasis on maintaining established patterns of habitation.



The picture shows a "Dumptor" (dumper truck) on its way out of the turbine hall at the Aura station. The post-war period was a time when the use of modern machinery made its breakthrough into the construction of power stations and the Norwegian state was in the forefront of this development. Such innovations meant that projects could be larger and still completed faster than before.



During the post-war years, Lars Evensen (1896-1969) was arguably the single most influential person in the formulation of the industrial and hydropower policies of the powerful social democratic party, the Arbeiderparti. Between 1947 and 1953, Evensen was Minister of Industry and the initiator as well as the driving force behind the new participation of the state in power production.

A HOME-GROWN MODEL FOR EXPANDING POWER PROVISION BY THE STATE

Through its investment in power production, the state expected to be able to meet three commitments in particular. Promotion of heavy industry and support of community electrification have already been discussed. The third commitment was to ensure the most rational use possible of resources invested in power generation and distribution. The overarching goal was in every case to create the greatest and most egalitarian improvements in national welfare and economic growth. One striking feature of the state-sponsored expansion in power provision was how often all three aims could be met within the framework of each project. This was particularly characteristic of the early construction phase. The Aura power station in central Norway, on

stream since 1953, has already been mentioned. Construction at Aura was initiated because there was an overall lack of power generation in an area where many households lacked an electricity supply. It was also clear from the start that Aura ought to supply heavy industry as well. The potential of this station was much greater than needed for public distribution and without a large industrial customer the station would never pay for itself. As noted above, once the USA had agreed in 1950 to support the building of an aluminium smelter at Sunndalsøra, all the jigsaw pieces fell into place. In this way, two criteria of the three the state had set itself were met: local electrification and new heavy industry.

However, the third criterion – that resources should be rationally used – was also well on its way to being met. Because construction of large hydroelectric power stations offers considerable advantages of scale, it was reasonable to build big. An assured market for the power was of course an essential precondition. Normally, the markets were found in the central regions where the distribution networks were already extensive and the demand high. But by combining supplies to heavy industry and the public network, large power stations were made into possible options also in areas with a poor distribution. The local population were among the winners, since their power supply came more cheaply.

As part of its rationalisation strategy, the state also contributed by building power transmission lines to bring about integration of local systems and also regional coordination. This was anyway required in order to allow for distribution of the Aura power. Of course, it was also an avowed aim of the state to promote integration and collaboration. This was why the NVE worked hard to set up an organisation to manage coordination, which was to include all the regional power producers. It opened

its doors in 1953 and was based on the Østlandet model from the interwar years (see Chapter 2).

Interrelating goals in this manner was also seen elsewhere, notably in the northern-most region. Here too, state power enterprises often became common denominators in complex formulae relating the ambitions of local and industrial politics to realistic resource distribution. This function was unique to the state. Locally owned electricity companies only very rarely went in for providing power to heavy industry, developing regional transmission facilities or establishing coordination systems. It is clear that the state involvement in this sector was qualitatively distinct from that of local government.

NVE IS RESTRUCTURED

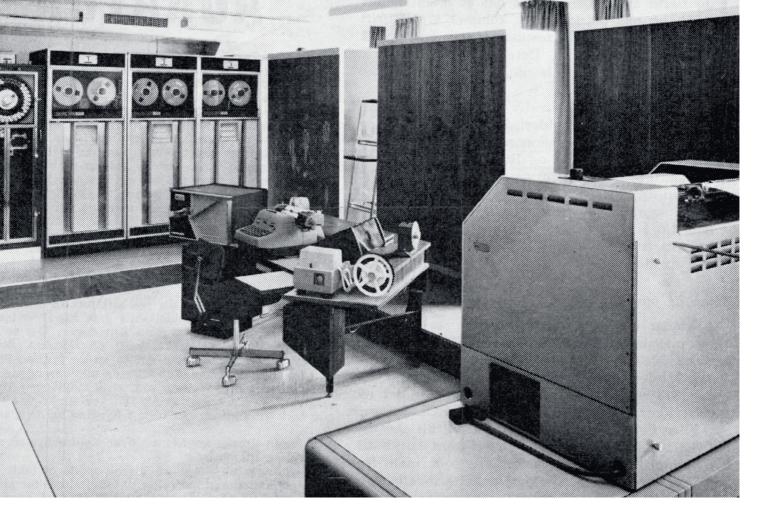
As the state involvement in power provision acquired a new life, so the relevant civil service department, the NVE, came to play a new and central role. NVE carried the responsibility for the planning, construction and management of state-owned power stations. Any of these tasks could pose serious challenges at any time. During the interwar years, the organisation had actually been badly run down in the wake of the economic crises and the accompanying hard times for state power provision. The construction section had suffered the biggest cutbacks, because this was an area which the state believed it should withdraw from at the time.

Someone had to lead NVE into the new era and Lars Evensen, the Minister for Industry, took personal charge of head-hunting Norway's probably greatest expert on hydroelectric power. He was Fredrik Vogt, then Principal of Norges Tekniske Høyskole (Norwegian Technical University). Vogt was an internationally respected hydropower engineer who had gained wide-ranging experience at home and abroad of both research and hands-on construction of power stations. As well as being a professional heavyweight, Vogt had close contacts among the leading politicians in the Arbeiderparti, and his influence was to be a highly significant factor in the rehabilitation of the NVE. He would also mentor many of the young engineers who joined the department during his years in charge (1947–60).

Vogt proved able to ensure that the departmental resource allocation was sufficient to allow it to carry out the tasks it had been given. Even though this was a time of many pressing needs and simultaneously a massive lack of capital, foreign currency and most kinds of raw materials, NVE and the state electricity program were privileged compared to most other ventures, public and private. Throughout nearly all of the 50s, NVE was almost without exception given the funding it appealed for. It did not only have to make sure that essential funding was in place, but also to recruit a large number of new engineering staff. The staff situation was in a bad way at the outset,



In 1947, Fredrik Vogt was appointed Director General of NVE (Norwegian Watercourse and Electricity Board). At that time, Vogt was a professor and also Principal of Norges Tekniske Høyskole (Norwegian Technical University) and an internationally recognised expert on hydropower technology. His role in the postwar reconstruction and revitalisation of the state's engagement in the industry was crucial. After retiring from his post in 1960, Vogt served as United Nations consultant on hydropower construction in developing countries, among many other tasks.



In 1964, the Norwegian Watercourse and Electricity Board moved into new offices in the capital. The building was regarded as the very latest in architecture. It was the first time that the organisation was working under the same roof.

because civil service salaries couldn't compete with what private firms paid engineers. But the state offered other attractions: many engineers, and especially the young ones, were tempted by generous project funding, professionally challenging jobs and opportunities to work on the most modern plant technology around. Another factor was that if any workers could pride themselves on being useful servants of society, it must surely be the hydropower engineers.¹⁸

In 1960, growing numbers of staff and projects triggered a reorganisation of the NVE. The need to handle current challenges more efficiently was one motive for the reorganisation, but it was also a response to the perception that a clearer distinction between the NVE's different roles was called for. The discontent was general, but the electricity industry as a whole felt especially strongly that administrative and regulatory functions should not be part of the organisation also responsible for the industrial management. There was concern that the state would be unable to resist prioritising its own interests. For a start, the previously separate construction and production sections were merged into one unit, intended to be more independent than before. The new unit for was given the name Direktoratet for statskraftverkene (State Power Board) or, more casually, Statskraftverkene, and remained part of NVE for quite a long time. The Board became a fully separate entity first in 1986, when the current state organisation Statkraft stepped onto the stage (see also Chapter 7).

A LASTING ORGANISATIONAL STRUCTURE

What were the consequences of the state-led expansion during the post-war period for the structures set up for established owners and official agencies? Did the growing influence of the state diminish the role of the local authorities? Did the central civil service, and the NVE in particular, dominate the shape of the sector's development priorities to an ever larger extent?

To some extent, and in specific areas, responsibility was taken away from local authorities and electricity companies, and handed to the centre. As the state grew into the dominant power provider in most regions, it was only natural that it often came to exert crucial influence on what happened next. It occasionally used its increased freedom of action to promote goals such as integration of systems and coordinated operation of power stations, using measures that occasionally crossed the intentions of local electricity distributors. At times, the state also intervened directly into the business concerns of local companies and power stations, for instance to stop local construction projects, or force companies to cooperate in various ways.

Having said as much, it is the *absence* of interventions and directives that remains the most striking aspect of growing state influence. It was truly rare for the state to challenge local decisions. The local authorities retained their key role in station construction and drove an expansion, which in fact was as great as that of the state. By the mid–60s, well over half of the total generation capacity was locally owned and continued as the core of the public supply, even as the state's capacity grew. Sharply rising consumption meant that the strong state expansion didn't interfere with the local providers: both parties were needed to meet the demand.

But that the state had no intention to displace the local authorities mattered just as much. It had been established already soon after the end of WW2 that the state would above all undertake such tasks that the communities could not or would not deal with – generally, the state was to compensate the communities when initiatives failed. With regard to the public supply, this meant that the state would carry out such projects as building the first power stations and setting up the transmission systems in regions which so far had been unable to do this on their own – as we have seen in the far north. Once completed, the state positively wanted the community to take over. As a result, local authorities in distant regions were supported during the time when they were taking over as managers of construction and production. To summarise, it would seem that the post-war development of the sector, despite the growing influence of the state, in essence entailed consultation and coordination between the state and the local authorities.



Chapter 5

Nation and coordination

Although the state grew more deeply involved in electricity provision during the postwar period, this process never became an end in itself. As we noted in the previous chapter, the state's new agency, Statskraftverkene, was not intended to take over all responsibility for building and operating power generation and distribution from the local authorities, but rather to step in where they could or did not want to take on the particular tasks. Ideally, the functions of the state and the local authorities should be complementary rather than competitive.

dmittedly, this doesn't imply that the relationship between the state and the local authorities was always peaceful, or that the interests of both partners could at all times be met without friction. Although the state didn't want to interfere with local government responsibilities, it exerted much more active control over the power sector after 1945. It inevitably meant that the state intervened in community affairs to a much greater degree than before and at times quite fundamentally. In the 1960s, when centralising ideas were dominant in many areas, this interventionist trend became particularly marked. It was at this time that NVE and Statskraftverkene jointly launched several far-ranging reforms of the electricity sector, which added up to a major shift in the influence of local authorities. Cases in point are the so-called structural reforms, aimed at creating bigger units through large-scale mergers of generating stations and electricity companies. This thinking led to an attempt by NVE and Statskraftverkene to set up a national coordinating body with the brief to oversee the management of all the power stations in the country. All these initiatives were driven by the ambition to reach one important goal: a more efficient and rational system for supplying electricity. Clearly, such changes could entail quite extensive interference in the local sphere of interest and the reform drive predictably gave rise to protests and strong opposition.

We have noted that local authorities had previously proved quite capable of blocking regulatory interference from an ambitious state (see Chapter 3). But in the 1960s, the situation was quite different from, for instance, the 20s. Now, councils had to face a state with much greater political legitimacy and whose responsibility for the nation's power supply was significantly more wide-ranging than before. In the 60s, many of the proposed reforms also had had the backing of a substantial Storting majority, not least the restructuring of the sector – which had in part been initiated by the Storting. Was resistance against such forces really a sustainable option for the local authorities?

THE STATE LEADS A RATIONALISATION PROGRAMME

In Norway, the distribution of electricity has so far been tied to local government. It followed that there were many, often quite small, generators and distributors. In the mid–40s, Norway had nearly 750 municipalities, and just slightly fewer electricity companies – around 600 – because several localities were not yet connected to a power supply. During the 50s, which could be called the "decade of local electrification", the number of stations grew to well over 800. ¹ One feature of the 1960s was the start of a centrally driven process aimed at merging local authority areas. The outcome was a reduction to fewer than 450 municipalities by the mid–70s. During the same period, the number of local electricity companies fell to around 500. However, many regions and districts were still very sparsely populated. By the mid–80s, ten years after

PREVIOUS PAGE: In the course of the 50s and 60s, almost the entire country was connected to the same long-distance electricity transmission network: the national grid. Extending of the grid – building the so-called core lines linking whole regions – was, in the main, the responsibility of the state.

the start of the local government reforms, only half of the local authority areas had more than 5,000 inhabitants; over a third had fewer than 3,000. Local power provision remained correspondingly small-scale.

Already during the 50s, observers had argued that this piecemeal approach prevented modernisation of the sector. The main objection to local provision was that these small companies were incapable of ensuring a rational, up-to-date electricity supply. According to the growing group of critics, such companies could not deliver the profits that big power stations with matching areas of distribution were expected to deliver. Many of the existing companies anyway lacked the financial clout to set up reasonably extensive distribution networks. Another failing was that they also couldn't afford to employ the right staff with technical, economic and administrative expertise in sufficient numbers.

The Arbeiderparti (Labour Party) was the first to articulate not only the nature of the sector's problem, but also its solution. In 1949, the party went public with a modernisation programme, in which one of the central tenets was that electricity should be supplied by bigger providers. Specifically, the present structure had to be reorganised into a few large, vertically integrated companies, capable of carrying the responsibility for all production, transmission

and distribution within each allotted area. The programme suggested the county as the possible organisational unit, but left the door open for still larger entities. This meant, in practical terms, that existing companies were to join forces and their owners get compensation in the form of shareholdings in the new regional provider.² It was, in other words, nothing like nationalisation on the French or the British model. Even so, it was obvious that reform of this kind could not be completed without pressure from the state. In 1950, the following year, recognition of this fact led to the Electricity Bill being amended to the effect that the department of state could authorise compulsory mergers of electricity providers.³ The message was clear: the ruling



The postwar power stations and their equipment had grand dimensions: this photo from the late 50s shows a turbine being fitted in the state-owned Aura station.



In the 6os, the state was committed to a policy of reorganising the electricity supply system into larger provider units. This picture from the early 6os was taken at a meeting in Lofoten in Nordland, called to discuss the NVE (Norwegian Watercourse and Electricity Board) proposal to merge several local electricity companies. Local interests protested vigorously and the Board finally had to impose its will. However, forcing the issue was not a desirable solution and gradually the state resigned itself to the continued existence of small local units.

party had the power to push through its demand for large providers.

However, in the course of the 50s, the Arbeiderparti was gradually backing down from the most ambitious regulatory proposals of the early post-war period. ⁴ As for electricity provision, the structural concerns came to be overshadowed by what was - when all was said and done - the number one priority of providing a supply for everyone in the country. But the desirability of regulation re-emerged in the early 6os. By this time, local electrification was in place practically everywhere. Besides, this was the decade when the concept of structural rationalisation dominated all types of planning. The contemporary response to most demands for efficiency and high productivity, in the public sector as well as elsewhere, was to create larger working units. This was partly the reason why the Arbeiderparti was no longer alone in its vision. Almost all the political parties lined up to support the virtue

of size. One early example was the Storting's Industry Committee, whose members unanimously stressed in their report from 1962 that the many small companies caused the electricity industry to be "run in a technically, economically and administratively wasteful manner." It followed that the outcome was higher tariffs and poorer service than necessary.

The word was out and the Arbeiderparti-led government reacted quickly. In 1962–63, NVE was asked to initiate and then carry through with a reform in the spirit of the report. The department had started to work along these lines already in the 50s, but with meagre results. This time round, it was given larger resources and allowed to use stronger incentives. A working party was charged with leading the work. The department was explicitly encouraged to use such legal means of enforcement as existed in the laws and regulations governing electricity provision and state support. However, being assured of political backup was at least as important, indeed essential, if the department was to hold its own when facing scepticism or outright resistance from local politicians and power industry interests.

GREAT AMBITIONS

NVE put great emphasis on ensuring that the structural reform was carried through properly. At first, the department spent a great deal of time on analysing conditions

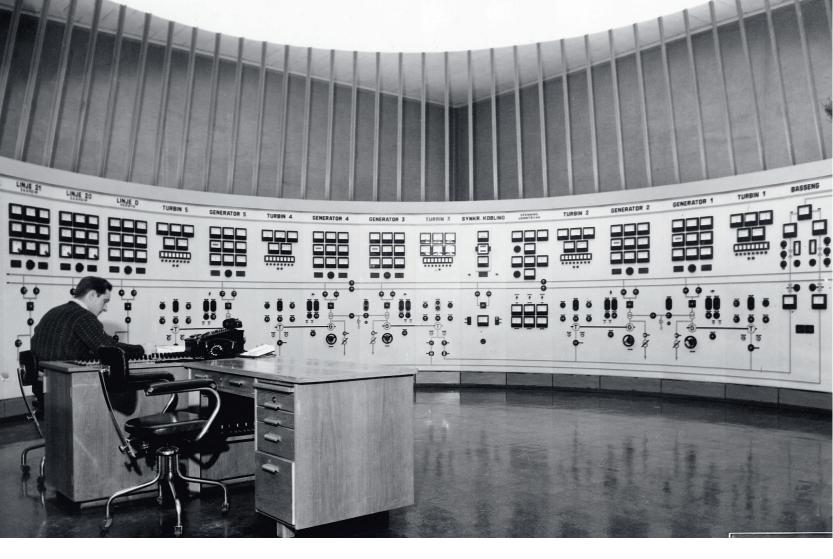
in different counties and regions of the country. The plan was to adapt the structure of the new companies as far as possible to the present local conditions. Normally, the analysis began at county level. We have seen that the Arbeiderparti had favoured the notion of "one county, one company" as early as the late 40s. NVE, too, strongly preferred this approach. Above all, using the county as the basis for electricity provision was a good idea because it was a well-established tier of local government, representative of all municipalities in both administrative and political agencies. Sometimes, they were also natural geographical entities. In addition, some counties had already created communal electricity companies. They often found that NVE held them up as models of good management.

If a county-based structure were to have been implemented consistently, it would have meant a reduction of industrial units from around 600 to around 20. Fundamental structural changes were discussed, as well as huge transfers of resources from single municipalities to the county agencies. However, NVE believed profoundly in what the figures said and also in the power of rational argument. The local lobbies could surely be persuaded to get over their resentment and take on board just how much would be gained by the mergers? Of course, the department's analyses didn't guarantee instant and large savings. It is mildly surprising that, despite all the calculating, the timescale was never specified. NVE simply concluded that rationalisation would deliver profits in the long run, apparently feeling that to state this was proof enough.

Buoyed up by its belief that rational argument would be enough to sweep away all objections, NVE expected at first to win the debate by providing information, "guidance" and voluntary solutions. It saw its own role as that of initiator and facilitator of local processes. As such, it could organise informative gatherings, bring potential partners together, set out the whys and wherefores of coordination, offer advice and, if called upon, serve as mediator. The department tried this scheme out in practice for the first time in the Lofoten islands in Nordland County. Circumstances had determined the choice of Lofoten. In the early 60s, the few local electricity companies were in poor shape financially and the state had stepped in as one of the electricity suppliers. Now, the idea was to merge all the generators and distributors in the area. Later, the newly formed company could in its turn become part of a future consolidated county power producer.

POOR RESULTS

In 1964, NVE went on the offensive in Lofoten. The department arranged information sessions and, later, brought the potential partners and local representatives to the negotiating table. It soon became obvious that many were very doubtful about the value of joining forces. The wish for continued local control over the power supplies was a powerful counter argument. Besides, there were several complicating factors,



View of the control room at Mår power station in Telemark County. Mår had come on stream in 1948.

including inherited conflicts between some of the communities, regard for local interests and personal antagonisms between leading politicians and company staff. All in all, the situation was a poor basis for fruitful discussion. The negotiations ran into the ground at an early stage and, however hard the people from NVE tried, they couldn't get the talks going again.

Now that voluntary solutions seemed unlikely to work, NVE felt it was time to use tougher methods. In 1965, the department decided to force a joint company into existence. Compulsion was of course considered a drastic way to go about things. However, it seemed necessary if NVE were to achieve positive results. In order to protect its back politically, the department presented the proposal to the government before acting on it. At this time, the Arbeiderparti no longer formed the government and had joined the opposition for the first time since 1945 (apart from a few weeks in 1963). After the autumn election in 1965, a centre-right coalition had formed the government. Not that this shift affected the rationalisation policy: the new ministers were wholly in favour of structural reform and supported the work of NVE.

The Lofoten case sent a warning signal. The reform programme was about to undergo a marked change, from being based on voluntary agreement to compulsion.

The problems that troubled the Lofoten negotiations were unlikely to be confined to that region alone. At the time, NVE probed attitudes in other areas and the results suggested that the Lofoten experience was indeed not unique. Being directive seemed the only approach that would do the trick.

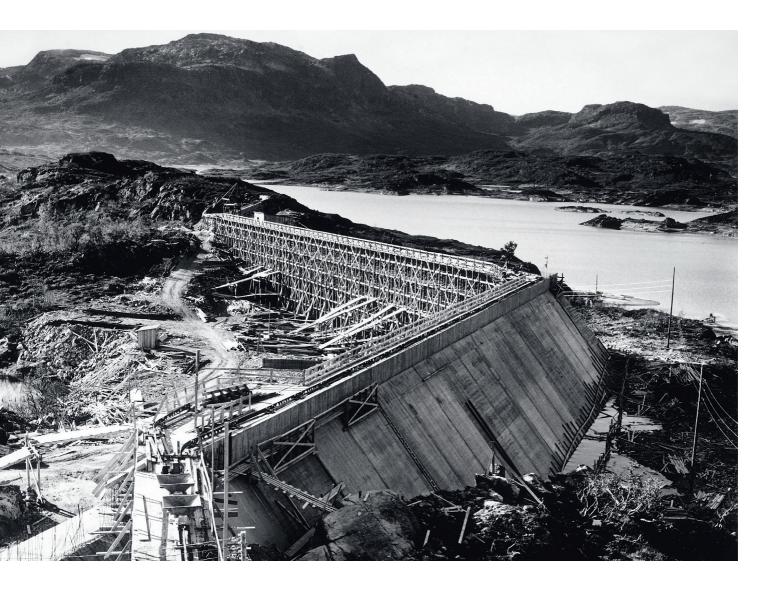
If only for that reason, it is surprising to find that NVE applied pressure only in the Lofoten case. Contrary to expectation, no stream of directives flowed from the NVE in Oslo after 1965. This had nothing much to do with local government changing its mood: the politicians continued to be just as rigid in their resistance to mergers. The effect was that voluntary mergers were only rarely completed. Why did NVE drop the compulsory option?

The events in Lofoten had taught the department a series of useful lessons. One was that compulsory mergers could present serious practical challenges. It wasn't simply a matter of deciding which companies would be off together. It was also crucial, though far from easy, to make sure that the result of the merger would be functional. Large issues were at stake for the proposed partners. The Lofoten negotiations showed how quickly issues such as the location of the new company headquarters could give rise to fierce confrontations. NVE couldn't ignore such conflicts, because it feared, on good grounds that it would be held responsible if a forced merger failed due to infighting and resentments between the local owners. It was all very well to force the councils into new alliances, but impossible to make them coexist peacefully.

The Lofoten episode also confirmed that the civil servants sent by the NVE to talk to the locals were often subject to quite serious stress. The long journeys were trying, as was being in charge of futile negotiations between parties with no wish to cooperate, and the frontline NVE staff was taken to task for what was usually seen as an overweening state misusing its authority. All in all, no one cared much for the work.

Besides, the NVE was actually far from enthusiastic about having to pressurise the councils. Practicality was one thing, but it mattered just as much that compulsion was an alien form of management practice in Norway, especially in the civil service. The NVE was no different and preferred persuasion. The whole forced merger exercise was an unaccustomed way to go about its business. Reporting in 1967 on the rationalisation process in Lofoten, the department noted that mergers, now and in the future, should in the first instance be voluntary arrangements rather than forced marriages. The report went on to say:

The work on structural rationalisation carried out by NVE has been based on the principle that, in order to bring about technical and administrative outcomes in line with the demands of current developments, we should rely on examination of facts and negotiation. It is also our view that we ought to prefer, whenever possible, this approach in future rationalisation tasks, not only because it in our experience

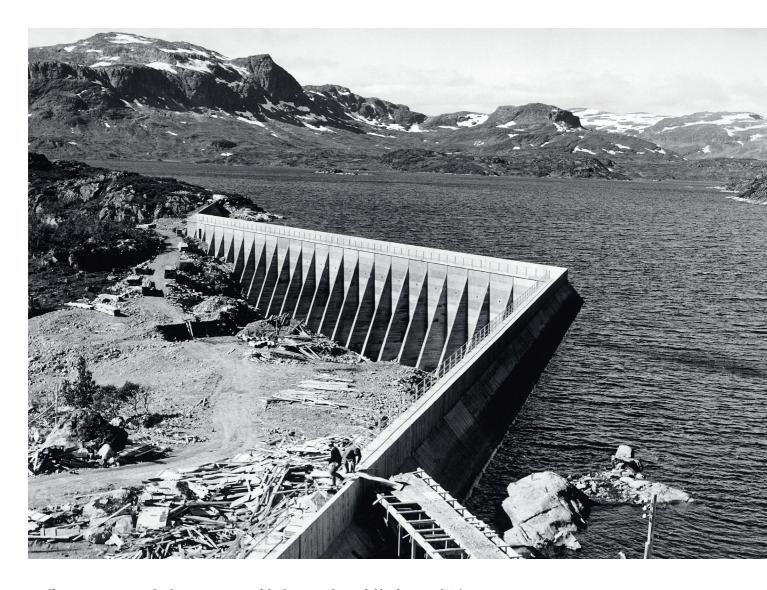


In the late 50s, the state undertook the construction of the Tokke power station complex in Telemark. The Tokke project consisted of several water reservoirs as well as power stations of varying sizes and was Norway's largest generation project so far. The picture shows the building of a dam at Kjelavatn.

means that the intended result is accomplished, but also because it fits in with our general understanding of parliamentary rule in this country." ¹⁰

AN INEFFICIENT SYSTEM?

Ending compulsion meant that NVE effectively shelved the entire rationalisation project. It did facilitate a handful of voluntary mergers in the 1970s and 80s, but there was still an enormous contrast between what was achieved and the 60s vision of 20 merged companies. By 1990, the actual number was still close to 400. What effect did this lack of vertical integration have on the ability of the electricity sector to manage its business goals? Was its fragmented structure truly as damaging a source of



inefficiency as NVE and other supporters of the large-scale model had insisted? These are major and complex questions, but in the next section I will review contemporary circumstances which may point towards the right answers.

Until the groundbreaking market reform in 1991, which will be more closely examined in Part III, many electricity companies were completely dependent on central funding. Between 1950 and 1990, the state handed out more than one billion NOK to individual enterprises as loans on easy terms or as direct grants. The majority of the recipients were small, local companies, which would suggests that small units were inefficient. But this seems not to be the case: there was no obvious relationship between the size of the company and the likelihood of being subsidised, since many large companies also asked for and were granted considerable sums of money from

The Kjela dam after completion; water has been allowed to fill it. However, these large water reservoirs has a major impact on nature in the area.

the State Aid Fund (cf. discussion in Chapter 4). Nor was it true that the large companies managed to offer lower electricity tariffs than the small ones. Parts of the country supplied from many small sources were often charged as low, or lower, average unit prices than those relying on a few large suppliers. Of course, prices are affected by a variety of factors. Be that as it may, there was no clear inverse proportionality between size of company and unit cost. The same ambiguity has been seen in other countries with a similar organisational structure.

It should also be noted that many local authorities, which may well have rejected the idea of joint power provision, proved nonetheless capable of collaboration provided it was on a voluntary basis. It happened quite often that localities joined forces to carry out projects, especially power station construction, which were beyond the financial resources of any one of them. Such consortia have built many of the larger generating stations. Usually, the participating councils or, more indirectly, the local electricity companies, set up a new company to manage specific projects of this kind. By virtue of such arrangements, smaller enterprises could overcome their probably greatest weakness, i.e., their inability to invest in large power station construction, and also profit from the advantages of large-scale generation.

THE DREAM OF A CENTRALISED ELECTRICITY SUPPLY

Alongside the structural considerations, there was in the 60s one particular area where the central drive to regulate confronted local electricity suppliers. NVE fought for the cause of a central board to manage coordination between the nation's power stations. The idea was that the state would be enabled by centralising to rationalise electricity generation. Every station would be run in accordance with the demands of the supply system as a whole, not with what might suit local owners. The goal was that the entire system could behave, in effect, as if it had one single owner. In other words, local providers were asked to hand over responsibility for day-to-day production to a superior authority. Without changing the ownership structure, this move would compensate for the decentralised structure and its lack of coordination and planning.

Statskraftverkene was the main agency to promote this idea. Some members of the staff were at times still more ambitious, and the director, Sigurd Aalefjær, was probably the keenest proponent of centralising generation. In the late 60s, he had devoted himself to establishing a national electricity monopoly, no less. His central organisation – Norgeskraft (Norway's Power) – would represent all generators, including the state. In Aalefjaær's view, who actually joined it didn't matter so much; the crucial issue was planning and coordination with national scope. One central company could apply rational criteria to nationwide aspects of construction and management.

For many, both in Statskraftverkene and in the NVE, such models and ideals

were found in national power monopolies, such as the French EdF and the British CEGB. ¹⁴ Besides, the 60s saw advances in computer technology that further strengthened belief in the opportunities that centralisation could bring. Computers allowed systematic data management on quite a different scale from before and were especially useful for analysis of factors such as water flow rates and storage levels, which are important for efficient coordination between hydropower stations. NVE had acquired state-of-the-art computers already in the early 60s, and begun to enter a wide range of historical watercourse information. The next phase entailed feeding datasets from larger power stations and their water supply into compu-

ter models that calculated for any one point in time how the nationwide system should be managed for optimal results.¹⁵

THE POWER
PRODUCERS REJECT
CENTRALISATION

Few believed in the possibility of a national electricity monopoly. Centralisation of power station management seemed a more realistic prospect, although it, too, would make inroads into the local companies' tradition of independent decision-making. However, unlike the single national company, this reform didn't change existing ownership rights. Besides, it could arguably be advantageous to all parties. Better utilisation of the whole production sector would, at least in theory, profit all.

The vision of centralised management seemed particularly timely in the context of moves to set up a national coordinating body for electricity generation. This was possible because the state

Conventionally, the construction crews were seen as rough, tough groups of men. But the workers formed many strong bonds of friendship, which often lasted throughout life. We know little about these men, but the photo suggests that they got on well together.



had taken the crucial decision to invest heavily in a nation-wide distribution network during the 60s. The main transmission lines linked the regions into a national grid and once all power stations were linked, centralised coordination became a realistic option. In 1970, five regional associations took the decision to organise into a coordinating body. It was to be another step in the same direction: after all, its brief was to facilitate joint production management, nationwide.

However, Statskraftverkene's vision was met with fierce resistance from local authority generating stations. This reaction was, in the first instance, based on fear that the state would dominate a centralised system. It was, as we have seen, the largest power producer in the country and owned the main transmission grid. Many were fearful that it would use its position to get a firm and lasting grip on coordinated production. Secondly, the generators felt that the existing coordination arrangements had gone far enough towards optimal utilisation of the network as a whole.

It was generally accepted that the current organisation contributed significantly to the coordinated and efficient use of the national production capability. At the same time, the system doubtless had its weak points. For example, every year a considerable amount of power was lost due to local managers who thought supplying their own area more important than selling power to the coordinating associations. It also seemed preferable to hang on to water surplus in the reservoirs as an insurance against possible future shortages, even though it often meant losing water, as it spilled over the dams. Besides, pricing by the coordinating bodies offered little encouragement; the tariff for coordinated power was set by the associations and was often relatively low.

The battle for the responsibility of running the system was fought during the first half of the 70s, in parallel with the planning for a national coordinating body. NVE and Statskraftverkene lost it comprehensively. Statskraftverkene held out for a long time for an Oslo-based joint national management centre, which would direct production all the way down to the council level. Such a centre was in fact established and reported to the coordinating body. In practice, however, it had no greater authority over the members than the regional centres. But it is still not true to say that the state failed across the board. After the creation of the national coordinating body, there followed a really important change, driven by the NVE and partly contrary to the wishes of the sector. It was the establishment in 1971 of the so-called Power Pool or Power Exchange. It formalised market-oriented trade in power to a greater degree than before. The pool system allowed producers with power in excess of demand to trade it in a market setting. The key idea was to obtain improved utilisation of the resources, both socially and economically. The marketplace could be said to be an alternative to the centralised management model, in that it could at least in part respond to the same challenges. The Pool became a very important element in the further development of the Norwegian coordination model for the electricity industry It was also a crucial

experience for the authorities in the late 80s, when they started to evaluate a more unalloyed market system, as we will see in more detail in Part III.

A FUNCTIONAL SYSTEM?

To summarise, the fragmented organisational structure of electricity provision in Norway persisted long after the end of WW2, despite the considerable pressure applied by the state to bring about centralisation. The widely accepted legitimacy of local government has probably been the most important reason for the resistance to change. When it comes to state interference with local political and administrative independence, the bar seems to be set higher in Norway than in many other countries. It has even been argued that strong identification with local communities is one of the most prominent features of modern Norwegian society. ¹⁶ In any case, it is obvious that municipalities and local power companies have proved able to resist state demands for centralisation to a remarkable extent.

However, this is not to suggest that the state has been incapable of regulatory control and provided an example of weak governance. It is probably more correct to see the stand-off between state and local community as typical of a certain model of government based on compromise, collaboration and mutual adjustment, rather than on directives and compulsion. The state has supported the sector by measures which have stimulated greater efficiency across the board. One outstanding example is the construction of the main transmission lines of the national grid in the 1960s, which was essential to the ever more far-reaching collaboration between generators and also to the new marketplace for trading excess power.



Chapter 6

Under pressure

Until the end of the 1960s, Statskraftverkene was held in high esteem. It was proverbial at the time that "what's good for Statskraftverkene, is good for society." During the first two postwar decades, tamed waterfalls powering huge turbines were unmistakable emblems of progress and modernity. To have to confront the environmental movement of the 70s, with its ideas about limits to growth, served as a harsh, even brutal wake-up call. By the late 60s, the steady expansion of hydropower suddenly ran into criticism. For the first time, to protect watercourses was advanced as a realistic alternative to industrial utilisation. Of course, that undisturbed nature had value in its own right was in no way a new notion, but it had no broad appeal until the end of the 60s. The next decade would bring a marked change.

he dawning of environmental awareness gradually changed the social framework for both Statskraftverkene and the power provision sector generally. During the 70s, permission to start a new hydropower project became harder and harder to get. The evaluation criteria were updated regularly and, more and more often, the balance tipped towards nature conservation rather than construction. Viewed from this new angle, the power providers looked increasingly like vandals, rather than midwives of the welfare society. In 1978, an engineer from Statskraftverkene said about his department's declining prestige: "In the early 60s, we were welcome everywhere. We felt, and were often told, that we were doing a good, socially useful job. All of a sudden that changed and now we're regarded almost as criminals."

However, although environmental policies caused them trouble, Statskraftverkene's staff would hardly have regarded the new pressures to be quite so burdensome, had it not been for the other serious problems of the 1970s. The oil crisis in 1973 had wide-ranging consequences, which also affected the electricity industry. Sharply increasing oil prices led to switching from oil to electricity on a large scale and for a range of purposes, especially space heating, which in turn increased the demand for new power stations. At the same time, it grew more and more difficult to plan and get permission to construct hydropower plants. The situation was very difficult, not least for Statskraftverkene with its supervisory responsibility for balancing the demand for and supply of power. But the state agency was far from paralysed, and already by the late 60s, it had quietly started to prepare for life after hydroelectricity. Reports on new energy sources, notably nuclear power, were commissioned. It was widely felt that reactors could provide the solution to environmental and oil crises. Soon it would however become obvious that this energy source, too, was anything but uncontroversial.

PREVIOUS PAGE: Construction machinery grew steadily larger during the postwar period – a development which allowed ever larger hydropower projects to be completed.

opposite page: A photo from 1968, showing a famous and very popular waterfall, the Vøringsfoss in the Måbø valley. The NVE (Norwegian Watercourse and Electricity Board) wanted to divert the water away from the fall, but the plan met with strong opposition from spokesmen for tourism and environmental organisations. In the end, the state's hydropower construction agency decided to change its plans.

A NEW ENVIRONMENTAL AWARENESS

Until the mid-6os, it was rare for hydropower projects to be opposed on environmental grounds. The urge for economic growth overrode concerns for nature, with perhaps only one exception: some of the most spectacular waterfalls were seen as important tourist attractions.² In general, generators were taken to task for interfering with nature only when construction caused economic damage, such as compromising local agriculture or fishing. However, the harm done was usually on





a modest scale. Most of the interference tended to be in marginal areas, such as the high hills, where few people lived and vested interests in watercourses were negligible.

Statskraftverkene was among the first of the power generators to be challenged by the new "Green" movement. The issue at stake was the gigantic hydropower project at Eidfjord in Vestlandet. One of its features was the diversion of the famous Vøringsfoss waterfall, a prospect that triggered strong reactions from organisations for tourism and environmental protection. Statskraftverkene had been prepared for a conflict about the waterfall itself. What the department had not seen coming was the new green opposition to the project, especially as presented by the biologists. Compared with the points made in favour of preserving a sightseeing spot, the arguments of the environmentalists were the more complex by far. In an attempt to negotiate with the opposition, Statskraftverkene asked a team of scientists to report on the project in terms of impact on river fishing and other aspects. Such consultations had been carried out before, with outcomes that had no noteworthy effects on the building plans as such. But, by the end of the 60s, the subject of biology had undergone a paradigm shift: it had been absorbing the new ecological thinking and, in the process, biologists changed their ways of working. This gradual merger of ideas led to a new emphasis, much stronger than in "traditional" biology, on the interdependence between life forms and their surroundings. Consequently, biologists now preferred to analyse watercourses in terms of integrated systems – ecosystems – and this method gave nature conservation a quite new dimension. A single intervention into a river system affected not only that section, but the watercourse as a whole. At Eidfjord, the biologists went about their study of the project using the ecological approach.³ Various nature conservation interests were deeply engaged in the project and adopted the new arguments as the basis for stepping up their demands for protection.⁴

In fact, the conservation bodies lost out at Eidfjord because, for one thing, the local authority hosts, who stood to profit greatly from the power station, were understandably very supportive of the project. Statskraftverkene dealt with the "core problem", that is Vøringsfoss, by agreeing to let the water back to the fall during the tourist season. But Eidfjord was only an omen of what was about to come. The first real confrontation between Statskraftverkene and the nature conservation lobby took place in 1970, in connection with the Mardøla station project in Møre og Romsdal County. The situation differed from Eidfjord in that the Mardøla case generated not only debate and restrained protest, but also civil disobedience by activist protesters. The instigators of the "Mardøla Action", as it was soon become known, were a group of leading academics, headed among others by the well-known philosopher, professor Arne Næss. The activists were committed to the "Gandhi protest". Crowds of demonstrators, sometimes up to 500 people, simply sat down on the access road and prevented Statskraftverkene's construction vehicles from continuing. The road sit-in lasted for



the best part of a month before the police finally removed them. As the policemen hauled unresisting demonstrators away, the images on TV screens at home and abroad were powerful illustrations of the advance of the "Green wave".

Mardøla shocked Statskraftverkene. For the department, it was one thing to confront growing criticism, but quite another to deal with actions that directly damaged work in progress. So far, this kind of protest had been more or less alien to Norway. The Mardøla Action triggered a discussion, often excitable, about the use of civil disobedience as a means of expressing an opinion. Still more importantly, started a wideranging debate about nature conservation. In the 70s, it would develop in ways which showed that the idea of conservation engaged large sectors of population.

NATURE CONSERVATION: THE IDEA IS INSTITUTIONALISED

In May 1972, the governing Arbeiderparti presented a legislation proposal to the Storting on the subject on *Planning for Conservation of Watercourses*, which was based on a systematic inventory of so far undeveloped watercourses.⁶ A committee made up of representatives from the NVE and the official nature conservation agency had prepared the report. The proposal set out guidance on the complete or partial preservation of river systems for the first time and recommended fully protected status for 96 systems with an estimated total capability of well over 7 TWh. In addition, 50 watercourses with a potential capability of 8.6 TWh were to be protected "until further notice". In 1973, the Storting accepted the report's recommendations and so took the

When NVE started construction at Mardøla in the summer of 1970, it had to deal with protesting campaigners blocking the works access. After one month of peaceful demonstration, the police carried the activists bodily from the site.



The energetic lady is Gro Harlem Brundtland on an inspection tour to Jotunheimen in the 70s. Brundtland, who later had three terms as Prime Minister, began her national political career as the Minister for the Environment. She intervened to preserve the mountainous region of Hardangervidda, and construction of power stations on its many large waterways is not permitted.

first step towards institutionalising the protection of watercourses.

In fact, the 1973 plan did not demand any great sacrifices. With a few exceptions, it was an uncontroversial list of watercourses with limited hydropower potential. Still, it sharpened the administration's focus on water resource management. Later, further recommendations were made and the number of protected watercourses increased steadily. In 1986, the Storting backed the so-called "Inclusive Plan", which evaluated all remaining watercourses and considered possible nature reserves. The Inclusive Plan was revised upwards in 1993 and the Storting backed this, too. By then, 325 river systems had been granted protection. Their combined capability was well over 35 TWh, which corresponded to about 20% of Norway's total hydropower potential.

Protecting watercourses was one aspect of an overall drive to institutionalise environmental management, which included the establishment of the Ministry of the Environment (Miljøverndepartement) in 1972. The Ministry was charged with environmental protection across the board, but looking after watercourses soon became an exceptionally important task. At a stroke, the main responsibility for any case that concerned a watercourse was taken away from the NVE. It didn't take long for Statskraftverkene, which was organised under NVE, to experience consequences. For instance, in 1974 the young, enterprising Minister

for the Environment, Gro Harlem Brundtland, persuaded the Storting to preserve the mountainous region of Hardangervidda by designating it a "National Park". This decision also entailed protected status for substantial hydropower resources which belonged to the state.

The institutionalisation of environmental politics also affected the processing of hydropower proposals, which grew increasingly laborious and time-consuming. As late as in the mid–6os, planning applications for even quite large projects were still given a rather summary examination. By the end of the decade, though, and especially during the 7os, the demand for documentation and impact assessments rose steeply, while at the same time there were more and more interested bodies to consult and concerns

to take note of. In addition, the increased risk that construction would cause conflicts meant that the political scrutiny also dragged on. By the mid–60s, Statskraftverkene counted on roughly a year-long interval between submitting an application and receiving permission to proceed. Around 1970, the time had increased to 3–4 years and, by the end of that decade, a controversial project risked circulating around the civil service for 7 or more years. Another new feature of the application process was the so-called "short back-and-sides" treatment, which entailed cutting back on watercourse development. It became more and more common for Statskraftverkene's projects to end up considerably smaller than originally planned.

Unsurprisingly, these developments were very frustrating for both Statskraftverkene and the sector as a whole. However, Statskraftverkene found the procedural changes particularly hard to deal with. As the national guarantor of energy and the agency responsible for balancing supply and demand, it would be especially hard hit if the nation's access to power was compromised by declining construction and curtailments of its ability to plan ahead. From the department's point of view, such fears were more than reasonable. Watercourse management was becoming so politicised that it felt no longer able to meet its responsibilities, at least not by hydropower alone. NVE's Director, Vidkunn Hveding, put it like this in 1973: "As matters stand, if we intend a plant to come on stream in ten years time, we must reach the planning stage, and be ready to apply for permission today. As the plans must also include margins for cutbacks during the application process, it is no longer possible for hydropower to keep in step with developments in energy consumption." However, Hveding had a very clear idea of how to deal with the challenges to his department. On the same occasion he went on to emphasise: "Thermal power generation in one form or another must be used."10

STATSKRAFTVERKENE WANTS A STAKE IN THERMAL GENERATION

Until the mid-6os, Statskraftverkene had carried on as an organisation essentially specialised in hydroelectricity generation. It was internationally renowned in this area. On the other hand, the department had almost nil experience in thermal generation technology, i.e., in power production from nuclear or conventional energy sources such as coal, oil and gas. When Vidkunn Hveding took over as Director in 1968, the situation changed. Hveding was a strong supporter of thermal generation and notably of nuclear power. In his opinion, a model of electricity provision based on hydropower, as in the Norwegian case, would for economic and operational reasons be better off if it also had a component of thermal generation. The continuing uncertainty around waterfall exploitation was a crucial issue. Hveding wanted Statskraftverkene to go in strongly for

building up competence in heat engine technology. The department was to concentrate in particular on nuclear power, which was of course close to Hveding's heart.

It was only to be expected that NVE and Statskraftverkene would take the lead in thermal generation. Within the power sector, few other agencies had sufficient resources to step in as major stakeholders. Nuclear power was a special case, because the Storting had already at an early stage decided that it should be the responsibility of the state. The main reason was the level of risk associated with this source of energy and hence the specific requirements for social control. In 1968, a separate thermal power group was set up inside Statskraftverkene. At the same time, the department began to collaborate with the Institute for Atomic Energy (Institutt for atomenergi or IFA), the nation's only research institution in this field.¹¹ It also was in touch with its Swedish sister organisation Vattenfall, which had been investing briskly in nuclear power since the early 60s. By 1973, Statskraftverkene had established its own unit for thermal energy, which soon became one of Norway's leading institutions in the field.

NUCLEAR POWER: FROM GOLDEN CALF TO VISION OF HELL

Nuclear power seemed a key to a golden future in which the contemporary problems associated with both environment and energy consumption were solved. The reactor would simultaneously save nature and ensure an everlasting energy supply for human society. Indeed, at first, the environmental movement itself saw the nuclear option as positive. Politicians of course found the new possibilities very attractive. The Storting set Statskraftverkene the task of planning for Norway's first nuclear power station as early as 1971. The mandate was clear and complete: the plant was to be ready for start-up by the beginning of the 80s at the latest. 13

Statskraftverkene didn't waste any time. In the course of the next couple of years, it evaluated a handful of alternative locations. Towards the end of 1973, it had drawn up plans for the first nuclear power station and assessed the impact at several locations. Now, close to the goal, the application for planning permission was being drafted. The building could go ahead, once the Industry department had signed on the dotted line. This stage in the procedure would be a walkover. Or so they thought. While Statskraftverkene had been investigating and mapping, the public's attitudes to nuclear power had grown more critical. The impetus had mainly come from abroad. At this time, environmental organisations had started to question the new energy source in several countries where nuclear power stations were up and running. The crucial issues were the accident risk and the problems surrounding storage of radioactive material. The United States was one of the first countries to experience protest reactions. In Sweden, the earliest large demonstration against nuclear power came in 1972. These movements also affected Norwegian attitudes.

But in Norway, really heavyweight resistance didn't manifest itself until 1973-74, after Statskraftverkene had started to propose options for where to locate the first nuclear power station. Spontaneously, each targeted community opposed being on the list and, as these reactions coalesced into organised protest movements, the next phase soon followed. It didn't take long for the situation to be turned upside down, as it became clear that communities were not keen to have a nuclear power station in their backyards. Another phase begun, as the attitude to nuclear reactors reversed, not only among environmental activists and people in neighbourhoods of possible reactor locations, but also more widely. Of course the leading figures in NVE and Statskraftverkene did their best to cool the debate down. But the hard facts - e.g., that reactor accidents were extremely rare – scarcely caused any shift in public perceptions. Besides, the facts were not unequivocal. True, reactor accidents were extremely rare, but no one person or organisation, including Statskraftverkene, could guarantee that an accident could never happen. In the case of nuclear power, one accident is one too many and the opposition stressed this aspect of going nuclear. It was a point that NVE and Statskraftverkene found hard to deal with adequately. 16

An anti-nuclear demonstration in 1974. NVE had planned to construct a nuclear power station, but it triggered violent protests. The Storting shelved the plan and the issue of nuclear power has not been raised again.



Two of the central characters in Norwegian state electricity provision after 1975 are shown here, side by side, in the Fossli hotel near the Vøringsfoss waterfall in Hordaland County. On the left, Vidkunn Hveding, who was a key official in the NVE (Norwegian Watercourse and Electricity Board) and its Director between 1968 and 1975. Sigurd Aalefjær was the Director of Statskraftverkene between 1960 and 1984; Statskraftverkene was the NVE unit responsible for the construction of power stations and the generation of electricity.



The political battle about nuclear power was fought in 1974. It was a fight that NVE, Statskraftverkene and the supporters of nuclear power would lose. The first warning came early in 1974, in connection with NVE delivering a thoroughgoing report on energy to the Storting. The conclusion had been unanimous: based on estimated energy needs for the next decade, the best option was to build a nuclear power capacity. The Storting, under heavy pressure from a critical public, chose to postpone debating the report. At the same time, a large majority also supported postponement of the project that NVE had in readiness. In 1975, the energy report finally got on to the Storting agenda, but the parliamentarians decided to stick to the earlier resolution. Instead, a broadly based committee was appointed and told to carry out a painstaking examination of the different problems associated with nuclear power generation. The committee was to sit for three years. In the meantime, all planning for nuclear reactors had to be suspended. In practice, it meant that for a long time to come, the whole issue was dead in the water.

Within NVE and Statskraftverkene, frustration peaked when the Storting backtracked on the report. The decision was a serious personal blow for NVE's director Vidkunn Hveding. As the head of the organisation, it was Hveding who above all had to step forward and defend his department's statements. He carried out his task very energetically. However, as a result, he came to be seen by many as a symbolic figure, the arch-technocrat and bureaucrat in the negative sense of both words. He could surely have tolerated this role, had it not been for his perception that he had also been let down by the politicians. The U-turn on nuclear power in the Storting looked like a betrayal of his department, which had loyally followed instructions from the very same parliamentarians. Hveding also felt angry about what in his view was a case of politicians abjectly giving in to activists and pressure groups.

Hveding found the department's situation so problematic that he resigned from his post in the spring of 1975. At the time, he harshly attacked politicians and the political system. In an interview he said this about his departure: "The process of making political decisions is becoming too fluid. Those meant to decide, once and for all, shy away

and simply leave things unresolved and vague. To an intolerable extent, conflicting signals are sent to those of us who are in charge of actual developments."¹⁸

A DEPARTMENT WITHOUT A DIRECTION?

It is not hard to understand why a man like Hveding should feel this way, shaped as he was by his background in an institution committed to electricity generation as society's cornerstone and as a function of state. But was it also a fact, as he insisted, that NVE and Statskraftverkene had been landed in a situation that made it impossible for them to meet their obligations?

Throughout the whole second half of the 70s, more or less explicit frustration with its leadership characterised the NVE. Sigmund Larsen, who succeeded Hveding in 1975, continued to present his predecessor's arguments, although a little less insistently. In particular, uncertainty marred the ever more complicated and time-consuming processing of hydroelectricity projects, which now remained as the department's only realistic option for increasing the energy supply. For example, Larsen wrote in the department's Annual Report for 1978: "Stricter requirements for investigations into the impacts of waterpower developments and for studies of alternative solutions has made it increasingly difficult to present projects in a conclusive manner, as well as on time." The department's general anxiety grew stronger still after the shock of the 1979 oil price hike, the second in the 70s.

The fear of an energy shortfall isn't hard to understand. State power provision was based on prognoses of consumption for the entire period after WW2. Consumption had been assumed to be a given entity, which could be manipulated only to a very minor extent. In addition, the goal of an assured supply was thought highly important. Both principles dictated that the production capacity at all times must be ahead of changes in consumption. However, as new hydropower projects took longer before being accepted and simultaneously tended to end up smaller than planned, the ideal of staying ahead seemed increasingly unattainable. For many, a power crisis appeared as the inevitable outcome of such a situation. For instance, Samkjøringen Norge, the organisation responsible for the national coordination of the Power Pool and which, alongside NVE, was the best placed to observe the national power supply, stated in 1979: "It must be emphasized [...] that, year on year, new supply capability is going to be less than the estimated increase in consumption. In the course of the next few years this may well lead to a very difficult situation."20 True, when coming up with predictions for the future, the sector's own lead organisations might well be expected to up the ante a little. On the other hand, there is no doubt that, during the years around 1980, the future looked darker than it had for decades. The balance of energy supply and demand had not been under as much pressure since the 1950s.

Still, things didn't at all turn out as badly as feared. There was no power crisis in the 80s. If anything, the power supply during the decade was characterised by considerable surpluses, a fact which was also demonstrated by the steadily increasing power export to Norway's neighbours. Since the 60s, new transmission lines and cables meant that Norway had gradually established closer links with its neighbours Sweden and Denmark. All these countries shared an interest in improving integration in order to facilitate power exchanges during periods of shortage or surplus. Norway was typically an exporter. During the 80s, there was in fact only one year when the country imported more energy than it exported. Both in 1983 and 1989, Norway's power exports broke all previous records, which must mean that the power generation was after all in very good shape.

There were several reasons for this continued success. Most importantly, the development of hydropower did not stagnate. Statskraftverkene continued to bring new power stations on stream during the 80s, including Ulla-Førre, which was the largest station ever constructed by the state.²¹ Many other electricity companies carried out similar projects. What made this possible was, at least in part, a weakening of the outbreak of opposition seen during the 70s. Some commentators have actually suggested that hydropower experienced a political renaissance in the 8os. 22 While this is an extreme way of looking at it, the new projects unquestionably caused fewer open confrontations. Another factor was the increasing integration between the Nordic countries, which helped to compensate for shifts in national capacity. A third and important factor was that the growth in consumption was less steep than the prognoses had stated. The energy demand from heavy industry grew less fast than expected, essentially due to weaker markets. Also, the weather helped a great deal. This was the case in particular towards the end of the decade, which brought several years of exceptionally large rainfalls and a succession of mild winters. By then, we also reached a period when quite a new idea about how the sector should be organised was emerging - an idea which had a most powerful effect on the thinking about energy balance and the role of prognoses. The marketplace was about to develop a way to deal with the challenges facing the sector. This is the main subject discussed in the next section.

Building stone embankment dams was of the special techniques favoured by Statskraftverkene. The photo shows the Svartevass dam, completed in 1976.



Part III

Emancipation? (ca. 1985–2009)



Chapter 7

The founding of Statkraft

"The NVE has retained an outmoded 1960s system of governance, which has been abandoned elsewhere in the Civil Service." This was how, in 1981, the Director of the Rationalisation Agency (Rasjonaliseringsdirektoratet) described the structure of NVE (Norges vassdrags- og energidirektorat), which was responsible for watercourse management and electricity generation. What grated most on the rationalisation director's nerves was that Statskraftverkene, the industrial arm of the NVE did not have sufficient independence. This was problematic for two reasons in particular. In the first place, it was absurd that Statskraftverkene operated from within the department of state in charge of regulating the very same sector. Such a set-up was questionable in principle, because it failed to establish a formal and secure distinction between the commercial and regulatory tasks of the state. Secondly, Statskraftverkene's subordinate status within NVE was unfortunate, because it limited the organisation's essential freedoms of financial and executive action. Statskraftverkene was funded directly from the national budget, on a year-by-year basis, which meant that it was vulnerable to changing political priorities, in the Storting and elsewhere. The Storting also determined Statskraftverkenes energy prices. The rationalisation director took the view that a tight linkage to the political establishment reduced business predictability. In consequence, this very large and important enterprise would not run as well as it could and ought to be.

he director of rationalisation had a clear vision: Statskraftverkene should be separated from NVE and reorganised so as to become financially and operationally independent. In short, Statskraftverkene must be more like an ordinary business.

The co-management of the state's regulatory and industrial functions had been controversial ever since the interwar years. Just before and after WW2, the Storting had repeatedly discussed such issues in general, but without changing anything. Nor was it a new idea that the industry responsible for building power stations and managing energy production should be free of direct state control. For instance, this had been a central issue raised at the start of the 6os, when the NVE was reorganised and energy production allocated to Statskraftverkene, the new "sub-department". Still, to sever the link to the state was simply not discussed.

However, it seemed that the 1980s would be different from the 60s and 70s. During the 80s, the thinking of these issues moved on in ways which contributed to a change of opinion about how Statskraftverkene should be organised. The efficiency of the public sector came into sharper focus, as did the need for clearer distinctions between the state's administrative and business functions. It was becoming more acceptable to use competitive practices and market mechanisms in order to achieve improved and more efficient public provision of goods and services. In 1986, Statskraftverkene was made independent from NVE and given a new name: Statkraft. The organisation had set out on the road towards more independence and a more commercial approach, a development that the ground-breaking and innovative market reform in 1991 would speed up dramatically.

This chapter examines the liberation that took place prior to the reform, while later chapters deal with Statkraft's post-reform "true" liberation and commercialisation.

But what went so very wrong during the 1980s? Why did the Rationalisation Agency regard it as crucially important to achieve independence for Statskraftverkene? For a start, we will look more closely at how the organisation functioned at this time.

WHAT WAS WRONG WITH STATSKRAFTVERKENE?

When we come to evaluate the Statskraftverkene's state of health, it is probably useful to begin with a comparison with the other "time-honoured" state enterprises for infrastructure management: Televerket, the monopoly on telecommunications, Norges Statsbaner, which owned and ran the national railway network and Vegvesenet, which was responsible for the national road network. In this company of state organisations, what was the profile of power provider? At the beginning of the 8os, all three – Televerket, Norges Statsbaner and Vegvesenet – were not highly rated by the public. Televerket was generally held to be hopelessly behind the times and seemed incapable

PREVIOUS PAGE: The elated construction crew at the opening of one of the cross-tunnels at the Svartisen power station in Nordland.



of meeting its operational requirements. Crucially, it had consistently failed in its primary task of delivering telephone services to everyone who wanted them. As late as 1980, there were waiting lists for private telephone subscribers. Norges Statsbaner seemed not to be in much better shape. By the late 70s, criticism of the railways was growing stronger, and poor punctuality was a major cause. In the eastern region, the company was especially prone to late running, interruption of services and many other problems. Its reputation was in steady decline, among many politicians as well as the general public. During this period, Vegvesenet was also becoming regarded with scepticism, mostly due to the increasing traffic problems, which led to bottlenecks and congestion in the larger towns and cities.

In comparison with these enterprises, Statskraftverkene stood out as a quite

In June 1982, King Olav V opened the Kvilldal power station in Vestlandet. Kvilldal's capacity is 1,240 MW, which makes it the largest power station in Norway to this day.

successful and well-managed organisation. True, it too had to cope with its share of criticisms. Of these, perhaps the most damaging was to be thought of as offending against the environment.⁵ But there was little to complain about with regard to the organisation's ability to fulfil its responsibilities. It was a fact that new power stations did not always come on stream according to plan, but when it came to general competence and technological skills, Statskraftverkene was very impressive and, in certain areas at least, considered a world leader. Its engineers created power stations, wrought out of mountainsides, rocks, steel and concrete, which were remarkably complex structures and so advanced that they were still admired in the 1980s. An opening of a new statebuilt power station was a spectacular event, which attracted much attention from official Norway as well as the general public. For instance, when the country's largest power station at Kvilldal in Rogaland County was ready to start up in 1982, it was only natural that King Olav V should lead the opening ceremony. There was nothing to suggest that a hydroelectric station with this level of output was backed by a troubled organisation. Instead, Kvilldal looked like a product of a truly knowledge-based enterprise with an international stature in its area of operation.

Nor did the usual complaints against other state enterprises, and in particular the accusations of being bureaucratic and hidebound, seem relevant to Statskraftverkene. The problems of Norges Statsbaner were widely thought to have their roots in internal stagnation and an oversized bureaucracy, criticisms voiced especially by conservative politicians. The rail enterprise was said to lack the flexibility needed to adapt to changing demands and operational conditions.⁶ Televerket was a target for similar comments.⁷ On the whole, and for the most part rightly, Statskraftverkene escaped this kind of accusation. It was a less labour intensive organisation than Televerket and Norges Statsbaner, the workforce was smaller and, if anything, undermanned relative to its tasks. When the Storting debated the funding of Statskraftverkene, it was quite common for the issue of staff shortages, particularly of engineers, to be raised.8 And when engineers from abroad visited Norway's main electricity provider, they often remarked on what were, to their minds, startlingly low staff numbers in relation to the work done. The employees themselves held clearly stated views about their organisation: for one thing, they saw it as unbureaucratic and lightly regulated. 10 There was much truth in this judgement and the primary reason lay in the nature of the work. The construction programme in particular was organised on a project-by-project basis, which left little margin for routine and bureaucratic rules. At this point, it is worth stressing that, throughout the post-war years, Statskraftverkene invested in rationalisation more systematically and determinedly than the other state enterprises.¹¹

The fact that Statskraftverkene was considered well run in general would then seem to depend both on the type of work it did, and on its organisation and internal culture. Furthermore, the enterprise owed much to a special relationship with its funding

NEXT PAGE: When Statskraftverkene was building the Alta power station in Finnmark in the early 80s, the local Sami population objected strongly. However, the Storting stood by its decision and the construction was completed, despite long drawn-out opposition, which aroused considerable media interest.

body. Compared to the other state enterprises, funding Statskraftverkene had been prioritised ever since the 1940s. It tended to receive the money it asked for, while the railways, telecommunications and, to some extent, roads were consistently under-funded. This remained the case throughout the post-war period, and even into the 1980s. 12 The contrast to its fellow state enterprises was actually striking. The funding regime for Vegvesenet in the 80s has been described as a "starvation diet". The allocations to Norges Statsbaner were gradually whittled away throughout the 70s, and then cut drastically during the first half of the 8os.14 Admittedly, Televerket had been financed at a substantially increased rate from about halfway through the 70s, but had had to cope with large cutbacks during the first half of the 80s.15 Besides, after the war, Televerket was quite consistently been given low priority and had to carry forward an unending and serious investment backlog.16 As demand for their services increased with time, meagre budgets and accumulating underinvestment contributed substantially to the inability of the state enterprises to satisfy their service users. This in turn meant that they lost legitimacy and trust. The exception was Statskraftverkene, which had escaped most of these problems.

Its apparently good condition was of course no guarantee that



Statskraftverkene was efficient. For instance, it is not unheard of that a generous budget can serve as a major cause of inefficiency, precisely because the organisation lacks any incentive to run itself in the most cost-effective way. In fact, Statskraftverkene *had* struggled periodically with budget overshoots on several big projects. This kind of problem was particularly prominent in the 70s and was usually blamed wholesale on the typically Norwegian growth in wages and costs during these years. ¹⁷ After 1980, overspending became less of a problem. Anyway, there is little evidence to suggest that Statskraftverkene cost significantly more to run than other power companies and similar enterprises. At least, no one raised the issue.

In view of what has been said so far, it would seem fair to assume that when the head of the state's rationalisation agency criticised NVE in the beginning of the 80s, his first concern was with the balance between administrative and business tasks, rather than poor management of Statskraftverkene as such. At the outset, possible confusion of tasks was in fact the dominant argument for separation. With time, however, the debate swerved in the direction of the operator and, specifically, the operational framework. When, in 1985, the Storting decided that Statskraftverkene should stand alone, the chief reason was that it would free the enterprise from political and civil service interference and that this was essential if the organisation were to be efficiently and profitably run. This might be thought a surprising turn of events. But, as we shall see, the decision wasn't specifically related to the situation of this particular enterprise and had much more to do with the wave of "quangoisation" which characterised this period.

THE CONSULTANTS AS CARRIERS OF THE PRIVATISATION BANNER

Who took the initiative, defined the terms and drove the process that led to the freeing of Statskraftverkene? In the first instance, the initiative came from within. To be precise, it was the executives who wanted a greater influence over the finances. This was an unmet wish, which they had been stating regularly since the early 60s. Then, just as the 70s was ending, new actors stepped onto the stage: the consultants. At this time, the executive increasingly turned to consultants to formulate its arguments for independence from both the Ministry and the Storting. The consultants came up with new ways of presenting the issues and, because they came across as objective, their reasons for freeing Statskraftverkene were believed to have particular weight and legitimacy, at least in some quarters. Hartmark-Iras, a Norwegian consultancy firm, played a central role in defining the negotiating terms. The firm is of interest not only in the context of Statskraftverkene's progress towards status change, but also because its role in this case seems symptomatic of an important, but often undervalued phenomenon: the function of consultants as agents of wide-ranging change.¹⁸

In 1979, Sigurd Aalefjær, Managing Director of Statskraftverkene, commissioned an organisational analysis from Hartmark-Iras, a consultancy firm that Aalefiær had engaged before on several occasions. The 1979 report was however to be focused more directly on appropriateness or otherwise of the way the organisation was tied to the state, and on its authority and competences relative to its superiors, i.e., the Ministry and the Storting. Specifically, it was to discuss what other kinds of structures would allow the Statskraftverkene more freedom of action. 19 Unsurprisingly, the report concluded that freeing up the relationship with the state would serve the enterprise well. In order to run itself as effectively as possible, the Statskraftverkene must be allowed guidelines more like those regulating private enterprise. The consultants argued, among other things, that it was important for Statskraftverkene to be financially independent of the Storting and hence be allowed to deal on its own account in the capital market. In other words, the enterprise had to be allowed to raise loans as it saw fit and also be given the authority to set the price of the energy it supplied. Controlling the income from what was, after all, its most important activity would make forecasts about this capital-intensive organisation more predictable.

But besides looking into the format of Statskraftverkene's relationship with the state, Hartmark-Iras was also asked to investigate its internal structure and functions. This proved quite a tough brief. Statskraftverkene had stayed more or less unchanged ever since the reorganisation of NVE in the 1960s: it was hierarchical and centralised in a rather old-fashioned way. In particular, the consultant's report stressed the need for decentralisation. If more authority were to be delegated to specialised sectors or departments, clarification of outcomes and responsibility for them would be easier to allocate. In this context, "divisionalising" was a central concept, which entailed distributing the organisation's activities to units – divisions – with their own rights and responsibilities. The main practical recommendation in the Hartmark-Iras report was that Statskraftverkene should reorganise and set up a strong, central office to oversee its self-managed units, or divisions. In the main, the dividing lines would follow the boundaries between different functional specialisations.

The decentralisation and "divisionalisation" models were taken straight from private enterprise, where they had been the norm for a long time.²¹ The stress on greater independence was another part of the same thinking. Still, was it necessarily right or appropriate to apply these business ideas, with little change, to a state institution?²²

The Ministry for Oil and Energy (Olje- og energidepartementet), i.e., the department of state with responsibility for energy sources, did not reject the Hartmark-Iras report and the issues it raised. In 1980, the Ministry used the report as the basis for setting up the so-called "NVE Committee". It was asked to investigate, among other matters, the question of how Statskraftverkene was to be organised in the future. True, the Ministry wasn't likely to agree wholeheartedly with Hartmark-Iras, especially in



the matter of Statskraftverkene going it alone. ²³ But the problems raised in the report were not dismissed. The most important mandate of the NVE Committee was to inquire into precisely what separation might entail, and how a newly semi-independent state organisation in charge of electricity – a "power quango" – might be organised.

The NVE committee submitted its report in 1982 and it was used as the basis for the official proposal, which was presented later that year.²⁴ The committee majority had been against quango status for Statskraftverkene, the main argument being that NVE as a whole was a coherent professional group, which could only suffer by being split. In this matter, the majority agreed with the Oil and Energy Minister, who had already made that very point.²⁵ However, a committee minority felt that Statskraftverkene would gain a great deal by being an agency in its own right and recommended separation and restructuring into a state-owned limited company. In the view of this group, the reorganised agency would be more efficient, as well as better placed to take at least some responsibility for financial outcomes.²⁶ But this view wasn't shared by most of the committee, nor by the Oil and Energy Ministry. Surely that clinched it?

STATSKRAFTVERKENE GOES ITS OWN WAY

Even though the Oil and Energy Ministry, primarily in charge of the whole inquiry, had expressed a preference that must be taken very seriously, its opinion was certainly not a decisive factor. Several departments and other official bodies were also involved to a greater or lesser degree. Furthermore, it was, and still is, common practice within the Norwegian state administration to consult the relevant non-governmental organisations (NGOs) and other interested groups. The NVE Committee report, too, was sent out on a consultation exercise. Interestingly, a remarkably large number of the consultees agreed with the minority report. This was true of heavyweight departments of state, such as Finance, and Trade and Industry, as well as the Department of the Environment and, perhaps less surprisingly, the Rationalisation Agency. The minority view was also backed by NGOs such as the Norwegian Society for the Protection of Nature and important organisations such as the Association of Norwegian Electricity Producers, which represented the mainly municipally owned power companies.²⁷ Most of the other consulted agencies also supported the minority report.

But not all: some organisations supported the recommendations of the committee majority. Three agencies, all very important ones, fell into this category. One was the NVE itself. The Board of the NVE (Hovedstyret), the top decision-making group in the department, and also the administrative staff felt that if Statskraftverkene were to separate from the NVE, it would adversely affect core functions. ²⁸ The department would lose many of its previous responsibilities for finance and human resources. The unions representing the employees feared for their members' security of employment.

View of the new NVE building in Oslo, taken from the bottom of the staircase. The highly modernistic architecture of the building, which was completed in 1964, was intended to express the department's social role. The NVE executive, lead by its CEO, finally joined forces with the Board to make clear how much the present relationship mattered for the professional integrity of the organisation.²⁹ It is very likely that the executive, too, resisted having key tasks taken away from them.

The members of the board, the executive and administration of the NVE, together with the affected trade unions formed a strong front against separation. Their jointly expressed views were doubtlessly taken seriously. But in the end, no one opinion turned out to be shared consistently. Arguments in favour of separation were heard especially often in the Ministry. In the main, this internal ambiguity was probably due to its varied types of staff: the Oil and Energy Ministry was a young organisation, set up to handle matters that had traditionally been dealt with by the Department of Industry. Once established in 1978, the new ministry naturally pulled in civil

A solitary car crossing the Jukla dam at Folgefonn power station in the autumn of 1974. Folgefonn is in the Vestlandet country of Hordaland.



servants with expertise in oil and energy questions, who had previously been part of the Industry establishment. But now, the staff was dominated by a large group of new and mostly young professionals, the majority of whom were economists.³⁰ They had brought new ways of working and new perspectives in general. Towards the end of the 1980s, this group became the driving force behind the liberalisation of the sector. It is highly likely that, during the first half of the decade, they were also particularly keen on the idea of greater independence for Statskraftverkene.

This point is worth emphasising, because the supporters of separation won their case in the end. By 1985, when the matter was in front of the Storting, the Oil and Energy Ministry had officially changed its position and recommended that Statskraftverkene should become a stand-alone institution. In the view of the Ministry, the new status was to entail some degree of independence, including greater freedom to act in certain circumstances. True, the Ministry did not go as far as to agree with the minority report of the NVE committee, which had recommended that the new status should be that of a state-owned limited company. It would have meant that the company would be in charge of setting power prices, which seems to have been thought inappropriate. The primary goal was to make efficient management easier, not to detach the institution from political control. As the Minister for Oil and Energy, Kåre Kristiansen, put it during the debate in the Storting: "In the first instance, change should be evaluated in terms of how efficiently and rationally Statskraftverkene would be managed as a result."31 The state-owned organisation was intended as an instrument to be used for future state steering of the electricity sector. Consequently, it was thought undesirable to set up a structure that was effectively outside of both the administrative and political control. Instead, it was intended to function in the future as an administrative unit, subject to regulations limiting its freedom to act, notably in financial matters. Such a regime would, among its other effects, cause Statskraftverkene to remain tied directly to the state budget.

These issues might have been expected to cause a vigorous political debate. Surely the Arbeiderparti would be especially critical of separation and even limited freedom of action? For one thing, this party had seemed to be among the first to express very sceptical attitudes to possible independence for Statskraftverkene. Secondly, the relevant trade unions had come out strongly against change, a factor in the power game that a workers' party couldn't easily ignore, even if it wished to. However, in the subsequent debate, the party raised few objections to the proposal. In fact, the party spokesmen supported it. Their arguments were strikingly similar to those of the conservative government, as represented by its Minister for Oil and Energy. Several of the party's key politicians underlined how importance it was for state management of power production to rationalise or, as one of them put it: "to work out an organisational model that would make NVE more efficient."



In 1986, Statskraftverkene was separated from the NVE and became a partly independent organisation with a new name and logo, but still operated within a civil service framework. The position of the Arbeiderparti is interesting because, among the larger parties, it had the strongest tradition of favouring political direction. With regard to differing views on the role of the state, the dividing lines followed quite neatly the ideological boundary between the political left and right. That the leading leftwing party none-theless took a positive view of the proposal was mostly due to the fact that the scope for political control of Statskraftverkene would still be quite large. While this was probably the crucial factor, it is worth wondering about the influence of the growing approval of notions such as less state interference, more competition and free markets. These ideas were to become more dominant in the years that followed.

Taking this argument further, we should also note the role of Hartmark-Iras. I have already referred to the commentators who claim that management consultants have been more important as agents of economic change than is usually believed. Jointly, the consultants may well have formed the driving force behind the strong international trend towards market liberalisation – at least, to a greater extent than normally assumed. The consultancy sector as a whole stood for many of the values and tenets, which formed part of this trend, including the sceptical attitude to state bureaucracies and centralisation of control. This was true also of the Norwegian agency Hartmark-Iras. It is noteworthy that Hartmark-Iras had links with the American consultancy sector and was hence very likely to draw on its ideas.³⁴

THE NEW STATKRAFT UNDER THE OLD REGIME

Statskraftverkene became a formally separate organisation on 1st January 1986. At that time it also changed its heavy and rather old-fashioned sounding name to the brisker, more up-to-date *Statkraft*. The new leadership further emphasized the status change by adopting a new logo, because it was important to be seen to be more of a modern corporation and less of a traditional administrative unit.

There was no doubt that Statkraft's profile was more like that of an ordinary business than Statskraftverkene's had been. For one thing, it was now given a divisional management structure, which led to a marked internal decentralisation of authority and responsibility. In this, it followed the pattern set by private enterprise. The separation had less effect on its relationship with the state, its owner. Above, we noted that, in the future, the new organisation would still be regarded as a department of state and that its activities would remain subject to political control. In other words, the separation in no way implied increased *political* independence. Statkraft would continue to be a policy instrument in the power sector. As such, it had executive responsibility and was required to undertake tasks outside a purely commercial framework. It was of course mandated to operate according to business principles, but was also to apply criteria defined by political goals. For example, Statkraft was to deliver power to large

industrial enterprises on conditions defined by state policy, even if this were to bring in lower profits than ordinary producers might have aimed for. To put it another way, the transition from Statskraftverkene to Statkraft represented above all an internal organisational change, a kind of sideways move from the administrative role of a *state department* to that of trading as a *state business*. To a lesser degree, the transition also brought about external shifts with regard to previously established functions, tasks and tiers of management.

Insiders in Statskraftverkene had hoped that a prolonged period of separation might lead to a somewhat freer relationship to the politicians, especially with regard to finance. On the other hand, no one in the organisation had much of a problem with carrying forward its role as overseer, as well as executor of political decisions, which of course had been the basis for its dominant role in the sector. Apart

from supplying power to large industries, the state-owned company would now take on critically important activities such as to plan for and then manage the national grid. It was asked to construct and maintain dry-year reservoirs and other systems to deal with periods of low precipitation. Its brief also included watching over and safeguarding the nation's power balance. The organisation was in charge of several demanding tasks and, in particular, seemed likely to be held responsible for planning national power needs. It would bring many great new challenges in the years to come. For the Norwegian power sector, the 1980s had begun with a relatively long run of reasonably healthy capacity, but by the middle of the decade there were signs indicating a growing pressure on supplies. Such situations called for joint handling by the entire sector, but especially by Statkraft.

A new way of thinking about trade in utilities, which were usually part of the public sector, emerged strongly during the second half of the 80s. The focus was now on creating free trade markets and on liberalised state enterprises gaining commercial independence. This kind of ideas gradually came to affect public activities in all areas, but the first subject for liberalisation was the power sector. By 1991, Norway had become one of the first countries in the world to establish a free market for power. This reform fundamentally transformed the roles and functions of Statkraft. The main subjects of the following chapters are the creation of the power market and the new status of Statkraft.



At a press conference in the autumn of 1985, Statkraft and Statoil, the state-owned oil company, jointly announced that they would collaborate on a new construction project: a gas-fired power station located in Vestlandet and supplied with North Sea gas from the Norwegian continental shelf.



Chapter 8

Creating the electricity market

"During the last two years, the electricity industry in Norway has undergone a fundamental restructuring and reorganization as part of a programme or an initiative by the government to reform public enterprise sectors with the purpose of obtaining improved economic efficiency in resource allocation. The key words in this reorganization of the electricity industry are: market-based production and distribution systems, deregulation, decentralization in decision making, and risk management."

his is how a 1993 report summarises the main features of the electrical power market, some two years after the reform that created it. In the summer of 1990, the Storting passed new energy legislation, which laid the foundation for market-based trade in electricity. The law was enacted in January the following year. That it led to "a fundamental restructuring and reorganization of the sector", as the report puts it, was no exaggeration. Just about overnight, generators and distributors of electricity had to respond to trading within a completely new framework of regulations, targets and challenges. One of these sudden changes was that electricity companies had to compete for subscribers, or – by now – "customers". The overall goal was to maximise earnings. It was hardly possible to move further away from the basic principles of the old system.

It actually took some time for the market idea and its profit-driven mentality to take hold. But a few months into 1992, Statkraft as well as the wholly private companies realised that trusted customers were turning their backs on old allegiances to buy from other, more aggressive traders who sold power at a lower unit price. The new trading climate caused shockwaves. It gradually became obvious that active adaptation to the market and its regulations was an absolute necessity, or else an enterprise had to resign itself to losing customers, turnover and income. In the course of the next couple of years, this stark truth had registered with the boards of most companies. But, apart from a change in outlook, the market reform had other effects. Step by step, businesses began to form different kinds of alliances. The trend accelerated especially during the second half of the 90s, and is often said to constitute the second development stage of the reform. Collaborative agreements or actual mergers turned out to be useful ways of sharpening a company's competitive edge. That this process gained momentum just at this point in time, i.e., the late 90s, had much to do with another, new component of the reform: Nord Pool, a Norwegian-Swedish power market started in 1996. The effect was to bring foreign providers to the Norwegian marketplace and hence constant stimulation of competition. Once the power market had gone international, company size became much more important than before.

The present chapter will examine more closely the basis for the reform, its political context and also the actual organisation of the marketplace. I will attempt to explain the key fact that Norway became a pioneer in this field. The power sectors in some countries, notably Great Britain and New Zealand, had been making cautious moves towards liberalisation, but none had gone as far and adopted the idea as wholeheartedly as Norway did in 1991. So, what drove Norway to achieve world leadership in the area of free trade in electricity?

The market reform has already been carefully investigated from many points of view. All the studies emphasise that this process was a part of the much more farreaching shift towards free trade and liberalisation that characterised this period. Also

PREVIOUS PAGE: The Alta power station in Finnmark, shown here in a photo taken in the spring of 1987, about one month before Statkraft completed this controversial project.



discussed are specific explanations that look beyond this general observation. Some commentators stress the changes which took place during the period leading up to the establishment of the European Union in 1993. Fearful that Norway might become marginalized at a time when European integration was progressing swiftly, the authorities tried to fit into the new, cooperative framework. For instance, in the second half of the 80s, EU civil servants had been working on the structure of the so-called Internal Market. One aim was to liberalise the electricity sectors of the member countries and promote trade in electricity across borders. Norway, an "outsider" country, got its market reform underway in order to keep up. Others have argued that the drive came from people in public life in Norway, especially members of the influential social networks that generally backed market reform and provided links between centres of power in politics, academe and the civil service. Another approach points to the conditions governing electricity production in the years around 1990, notably the heavy precipitation and mild winters that generated a large power surplus. Economists are rather prone to regard surpluses as symptomatic of economic inefficiency.

Such observations cast light on the actual reform proposal, but none of them satisfactorily explain why only Norway was so quick off the mark. Anyway, the early liberalisation of the electricity sector doesn't seem to fit in with the generally slow uptake of liberalisation in Norway, as compared with other countries. Here, my intention is to

Under construction in the 70s and 80s: the Sima power station in Hordaland, a grand Vestlandet project managed by the state.

stress another aspect, which has not been much discussed so far. It is that the Norwegian electricity sector had certain institutional and organisational features particularly suited to a change to market trading. It is also arguable that these features are in some respects crucial to the success of the Norwegian reform.

A LONG-STANDING BATTLE

The electricity reform of 1991 was in many ways a triumph for the economic profession. For many years, a group of Norwegian economists had fought a drawn-out battle across a wide front with the engineers, who favoured going ahead with construction and production. But the economists had been criticising the sector for over-investing and wasting resources ever since the 60s. In their view, the problem was that the power companies didn't charge enough for their product. The companies tended to adjust prices so that sales covered total production costs, but in general didn't generate a net profit. In effect, this meant little or no return on the invested capital. In addition, the principle of meeting costs, widely accepted among power companies, had the effect of making older, wholly or partly paid-for power stations subsidise new construction. The two factors combined to cause higher consumption of electricity by both industrial and domestic customers than would have been the case if the companies had adopted a "normal pricing policy" – i.e., that sales income should not only meet interest on capital investments, but also bring in a reasonable profit. The economists argued that society as a whole lost out, because as power provision grew more than the economy needed, money was spent on construction rather than invested in projects capable of generating higher incomes.

The case made by the economists had as a central tenet that the route to a socially profitable power sector must be based on the so-called long-term marginal cost price policy. To simplify the principle slightly, the idea was that electricity prices should ideally be set at a level that would cover the cost of generating electricity in newly built power stations, including the usual capital costs. From a strictly economic point of view, to construct a new station was defensible only when sales income matched expectations of a reasonable return on each new station, i.e., when return on capital was comparable to other industrial investments. This principle could become practice only if all construction projects were subject to centralised planning. Because the starting premise was that the companies had been undercharging, it followed that construction had to be stopped for a period long enough for the prices to rise sufficiently to pay for new builds. Using building costs in the mid–70s, it was calculated that electricity prices should increase by more than 50% to balance the long-term marginal costs.

The long-term marginal cost price policy was driven by the same expectations as

the market reforms: the goal was more efficient utilisation of the resources of the electricity sector. The pricing policy had however little to do with markets, competition and decentralised decision-making structures. Essentially, it implied a strictly planned system, in which decisions about construction, as well as prices, were made centrally and on the basis of more or less theoretical criteria for profitability. In other words, the approach didn't suggest any future move away from the traditional, economic ideas and towards market reform.

However, there were also economists who at an early stage had proposed the introduction of more traditional market-based solutions. Among them, Einar Hope was a prominent figure. Hope was a professor at the Norwegian School of Economics and Business Administration (Norges Handelshøyskole) in Bergen, with a particular interest in micro-economic and market applications in contrast to the macro-economic ideas favoured by most university econo-

mists. He had paid special attention to the electricity sector ever since the 6os and his research into power production and supply was guided by this approach. The topics that interested him in particular were the principles of coordination and of trading in surplus power. Once the Samkjøringen (the Coordination Board) had set up its power pool in 1971 (cf. Chapter 5), Hope had plenty of opportunity to investigate market-based trading in electricity, if only at a fairly rudimentary level.

The power pool of the 70s dealt only in surpluses. Einar Hope argued from early on that a larger share of the power output should be traded in this way. It would, he felt, tend to make power allocation, or distribution, more appropriate. The reason was that a market system, unlike centralised price management, discriminated between consumers who had showed differences in willingness to pay. For instance, at times of shortages or high demand, consumers prepared to pay top prices were likely to be prioritised in a marketplace. The expectation was that the most willing buyers would also be those who used power in the most profitable manner. The long-term marginal cost price policy didn't include this dimension.

TOWARDS A CENTRALLY CONTROLLED SYSTEM?

By the mid-8os, economists remained divided about which of the two distinctly different approaches to electricity production and marketing was the preferable option. The dominant views were unquestionably based on macro-economics and central planning. Einer Hope's studies had yet to be widely acknowledged. Already early in



Einar Hope, a professor of economy who is often singled out as the chief architect of Norway's energy legislation. By 1988, when Hope was appointed by the Oil and Energy Ministry to lead a team charged with investigating options for a free market in power, he had been studying the development of the electricity supply in Norway for several decades.



the 70s, official inquiries had favoured the long-term marginal cost price policy and, later on, the Storting also backed the idea. However, nothing had been done due to resistance within the sector and failing political will. Now it seemed that the time had come: in 1985, the so-called Energy Legislation Committee produced a thorough report, which included the draft of a new Energy Bill. One of the committee's central objectives had been to formulate ideas that would to help the power sector to operate more efficiently. The most striking proposal was that one vertically integrated company in each county should manage the electricity supply - that is, there would be a total of just 20 companies. This, as we know, was an idea with a long past (cf. Chapter 6). The restructuring would eliminate, in the first place, smaller operators who were conventionally believed to be less efficient than big ones. Fewer companies would facilitate central management and coordination of construction, as well as the eventual introduction of the long-term marginal cost price policy.¹⁰ This view had solid political support, especially within the leftwing Arbeiderparti. When it took over government in 1986, energy legislation based on these recommendations was duly proposed to the Storting in 1989.

This meant that as late as one year prior to the enactment of the new energy law, it seemed a given that the traditional, centralised approach would be victorious, rather than a market-based system. So, what happened in the course of the following year to cause a complete U-turn in favour the idea of a free market?

FROM A PLANNED TO A MARKET ECONOMY

Inside the civil service, there were those who thought along the same lines as Einar Hope. Tormod Hermansen, the top civil servant in the Finance Department and a trained economist, was one of the leading figures. Hermansen was a member of the Arbeiderparti, but belonged to a growing group of younger, reform-minded party activists. In 1987–88, one of his tasks had been to chair a committee set up to investigate how public services could be made more effective. The final report of his committee unequivocally backed liberalisation and a more aggressive use of market instruments. Some civil servants in the Ministries of Finance and of Oil and Energy, most of them trained in economics or law, also felt that Hope's analyses made more sense than the planning-centred approach of the Energy Legislation Committee. They chose Hermansen as their linkman and, once an initiative to prepare an independent alternative report had been agreed, as their organiser-in-chief. In the late summer of 1988, while Oil and Energy Ministry staff was drafting the Bill incorporating the recommendations of the Energy Committee, the reformists started work on their report. And who was the obvious choice as expert? Einar Hope, supported by his team of researchers.

Much has been written about the groups working with respectively Tormod Hermansen and Einar Hope and their ability to get on together, as well as how they swiftly developed into a hard-hitting alliance between highly qualified, expert economists and influential, effective and very well connected people from the intersection between the civil service and the political establishment.¹¹ A great deal of attention has also been paid to the economic theory that was fundamental to the work of Hope and his team and gave rise to investigative work carried out in the autumn of 1988 and throughout 1989, until late in the winter.¹² This process will not examined in detail here. Instead the discussion will be limited to an outline of how the market idea rapidly changed from a more or less unofficial notion to a concrete programme for political reform, which was later realised.¹³ It is one thing to propose theoretically and practically well-argued reforms, and quite another to guide it through political minefields, especially when the plan is radically different from established patterns of thought.

Late in the winter of 1989, Hope's research group presented a report called *A Norwegian Energy Market*. ¹⁴ It set out the theoretical basis for a electricity market and also set out the main features of a practical and institutional framework needed to sustain such a system. The reform-hungry team around Tormod Hermansen was very interested in the report. Still, no one really expected that these ideas would have any meaningful influence on the process of energy legislation. The Minister for Oil and Energy, Arne Øyen, another economist, was in fact quite appreciative of the market idea, but wasn't prepared to back it wholeheartedly. The drafting of the energy law continued, largely unaffected by the Hope report. Then, in April 1989, the legislation

PREVIOUS PAGE: An aspect of the Ulla-Førre power station, under construction in 1980. Ulla-Førre is the largest electricity generation project ever completed in Norway and represents in more ways than one the end of the great period of hydropower projects.

proposal was put in front of the Energy and Industry Committee of the Storting.

Unsurprisingly, the leftwing Arbeiderparti members of the Energy and Industry Committee supported the legislative intentions of their government. The right-of-centre members were less keen. They were not only ideologically adverse, but also mindful of the local authorities and their criticisms of the county company model. The Høyre party in particular distrusted economic models based on centralised planning. As the majority of the committee belonged to the rightwing opposition, the draft was sent back with the request that the government rework the proposal to be more in line with the majority view of the committee.

The Arbeiderparti government was reluctant to take this rebuke as read and, in the autumn, tabled a practically identical legislation proposal. However, it so happened that the Storting election was due that very autumn, and that the left, including the Arbeiderparti, had the poorest results since the interwar years. This opened the door for a conservative government. Høyre, Senterpartiet (the Centre Party) and Kristelig Folkeparti (Christian People's Party) formed the government, led by the Høyre representative Jan P. Syse. Eivind Reiten took over the post of Minister for Oil and Energy. Actually, Reiten didn't belong to Høyre, but to the more middle-of-the-road Senterpartiet. He was an economist, too. Perhaps even more significantly, he was very well informed about the energy sector and had considerable insight into the business side. Reiten had held the position of Managing Director in the Energy Division of Norsk Hydro, one of the largest industries in the country with its own large electricity production. Norsk Hydro had been critical of the monopolistic electricity sector for a long time, because it made it harder to sell off the company's excess output. A marketplace for the power trade would undoubtedly improve its chances. Tormod Hermansen and his reformist team with their market aspirations could hardly have hoped to present their ideas to a more responsive man than Reiten.

One of the first things Reiten did in office was to withdraw the previous government's proposal for energy legislation. At the same time, his department started working on an alternative, which was to be based on the Hope report. The drafting was done in record time, helped not least by the groundwork that Hermansen's network had already carried out. The Energy and Industry Committee received the first version already in March 1990. Among its central proposals it included removal of the area monopolies and also of the so-called "duty of supply", which meant that whoever held the local monopoly rights was obliged to satisfy all electricity demands in that area. Another key feature was that clear demarcation lines were drawn between managing the distribution network, which would remain a monopoly, and the power trade, which would be competitive. ¹⁵

In the Storting committee, the members of the Arbeiderparti and the Sosialistisk Venstreparti (Socialist Left) rejected the government's proposal. Of course, for as long

as the right-wing parties held the majority, the rejection carried no weight. Crucially, the power sector also supported the new law, although it certainly didn't express any burning enthusiasm for the market idea. But what the Høyre government proposed suited industry a great deal better than the Arbeiderparti option, mainly because it wouldn't entail any changes in established ownership structures. ¹⁶ And this was a bonus point, which took precedence over most other aspects. The result was that the proposal became law without much further discussion and, suddenly, Norway was a world leader of the liberalisation of trade in electricity.

DIVIDING STATKRAFT

As already noted, it was only the trade – the buying and selling of power – that would be open to free competition. The distribution side of power provision, responsible for transmission of electricity from the producer to the consumer, would retain its monopoly position. The reason for this was that to build and run transmission and distribution networks seemed by definition to be so-called "natural" monopoly activities, with economic and technical features that didn't fit the rules of competition.

However, in a market-based system it is critical that clear distinctions are made between these two aspects in order to avoid cross-subsidies, i.e., one side of the business paying for the other. The result would be to weaken competition. ¹⁷ The issue was a critical challenge to the regulators, since the great majority of generating companies not only bought and sold power, but also ran transmission and/or distribution networks. However, the energy law didn't require such companies to be carved up and

In the early summer of 1991, 2,500 Statkraft workers went on strike in protest against the plan to set up a separate organisation to manage the national grid.





On 20th December 1991, Statkraft lost its control of the national grid. The formal separation was attended by the Minister for Oil and Energy, Finn Kristensen and on Kristensen's right, the chairman of the Statkraft Board, Hans Bjøntegård.

only insisted that competitive and monopolistic business activities were to be formally kept apart in financial and bookkeeping terms. ¹⁸ The authorities made just one exception to this rule: Statkraft was instructed to separate its national "central grid" from the rest of its business.

The central gridlines together had a unique role within the electricity supply system: they served as the "national routes", interconnecting the regions of the country. For the market, this axial set of power cables had two linked and exceptionally important functions. In the first place, for nationwide power deals to run smoothly, current should flow as freely as possible between regions. Secondly, the actual grid had to be closely integrated into the organisation of the marketplace itself, i.e., where the traders met to buy and sell. In the old, centrally regulated system, the Samkjøringen Norge was responsible for the coordination of the deals, while Statkraft had provided access on set terms to the central grid. In a market-based system, it was unacceptable for one of the traders to own the core network because it inevitably conferred a dominant role. To ensure that traders trusted the market system, the owner of the national grid had to be a neutral operator, which hardly applied to the commercially active Statkraft.

The 1989 Hope report had already raised the issue of the national grid and its importance. It recommended that it should be taken out of Statkraft's control and converted

into a company in its own right.¹⁹ The Oil and Energy Department backed this conclusion. True, Statkraft objected strongly, claiming that without the core network, it wouldn't be able to fulfil its role as state regulator of the sector. Besides, the grid was especially important to Statkraft as the only generator with power stations located in every part of the country.²⁰ In the absence of its current grid access, it was claimed, Statkraft would be incapable of managing its production optimally. These objections didn't go down well. As far as the Oil and Energy Ministry was concerned, a well-run market mattered more than Statkraft's claims, which the department anyway didn't wholly accept.²¹

ESTABLISHING STATNETT

The question was: how best to reorganise the national grid? The Hope team had suggested that the old coordinating body (Samkjøringen Norge) should own the grid as well as be responsible for managing the market. Samkjøringen had a long, wideranging experience of coordinating both the production and the distribution of power, and also precious trading competence through being in charge of the exchange system for temporary power surpluses. However, the energy department saw it differently and instead chose to redistribute these functions by setting up a new state-owned company. In 1992, Statnett was established and took over control of the national grid. In addition, Statnett was made responsible for the organisation and management of the market – or "the marketplace".

The last point was critical for the Samkjøringen, because the effect was to remove its reasons for existing. The Oil and Energy Ministry had decided to incorporate its entire set of functions into Statnett. In this way, Samkjøringen's valuable skills would benefit the new operators. It was also part of the plan to enhance Statnett's legitimacy by the inclusion of the previous coordinating authority. Many of the agents in the power sector remained sceptical about state bodies controlling both core transmission lines and the marketplace. Even though the national grid would be removed from Statkraft, it wasn't entirely credible that the state would keep its control of transmission separate from Statkraft, its other stakeholder in the power business. Besides, a large proportion of Statnett's staff would be Statkraft ex-employees, who had climbed aboard the removal vans destined for the new organisation. Not everyone was prepared to take it on trust that their first loyalty wouldn't still be to the old firm.

As it turned out, the old coordinating body came to play a particularly prominent role in Statnett. It was put in charge of the planning and development of the new company. Perhaps even more noteworthy was that both the MD and the Deputy MD of Statnett had held positions in Samkjøringen.²² Other members of its staff were also given important posts in the new organisation. These appointments undoubtedly



The photo shows the headquarters of the Foreningen Samkjøringen, the organisation responsible for coordination of the electricity network. The new state-owned organisation Statnett took over responsibility for operating the system in 1993.

helped to strengthen the sector's impression of Statnett as at least a largely neutral organisation.

The integration of the Samkjøringen i Norge into Statnett probably contributed a great deal to the carry-over of several key attributes from the old coordinating system to the new market-based one. Continuity was clearly seen in the careful integration of users into the executive structures of the company. Samkjøringen had had a distinctively user-oriented executive and, even though the state was now sole owner of Statnett, this tradition was transferred, too, as part of the move. Users were strongly represented on the executive of Statnett. The company also set up a users' council with the right to make its own statements in important issues. User participation was even more to the fore in the daughter company Statnett Marked AS (Statnett Market Ltd), set up in 1993 and intended to provide more support for the role of the market as an objective adjudicator. Statnett Marked was wholly state-owned, too, but the sector exerted authority in various ways, which included selecting half the membership of the company board. The company had its own users' council, the so-called Market Council, with seven members elected by the users from among their own colleagues. The Market Council had an advisory role in matters concerning organisation and execution of market functions and reported directly to the company board.²³ Here, it should be pointed out that people from the Samkjøringen were appointed to senior positions in Statnett Marked AS, too. For instance, the first MD of the company had started out in Samkjøringen i Norge.

EXPORTING THE NORWEGIAN MODEL

Establishing Statnett in 1992 and Statnett Marked in 1993 meant that two institutional milestones now served as markers along the road to developing a market in power. A third milestone was put into place in 1996, once the Nordic power exchange – the Nord Pool – was established. This was significant, also in the global trading context: Nord Pool was the world's first international power exchange.

Statnett was an important agent in the creation of Nord Pool. "Our ambition is to play a very central role in the creation of a Nordic power market and an inter-Nordic power exchange," as the President of Statnett Marked put it in 1994.²⁴ One necessary condition for progress was of course that Norway's neighbours also liberalised their electricity sectors. So far, this hadn't happened. However, stimulated by the Norwegian initiatives, some of the Scandinavian countries had begun to makes moves in that direction by the middle of the decade.²⁵ Finland took the step in 1995, Sweden the next year. At the same time, Sweden decided to go together with Norway and set up the power exchange that, as we have seen, became known as Nord Pool. By the end of 1998, Finland joined the cooperative venture. Denmark liberalised in 2001, and then joined Nord Pool, too.

That Nord Pool materialised so swiftly was in particular due to the longstanding inter-Nordic discussions about just such a mechanism. In Norway, it had actually been a goal ever since the earliest days of the market reform. ²⁶ In particular, senior staff at Statnett had faced Nordic colleagues in negotiations for many years, determined to bring about integrated free trade in power. Besides, it was critically important that Sweden, in 1992, took its national grid away from the state-owned electricity company Vattenfall and instead set up a separate state company to run the grid. ²⁷ It gave Statnett a neighbour and partner with similar functions, perspectives and expectations of the future. The two companies started talking to each other at an early stage. In 1995, they jointly presented a report recommending cross-border trade through an exchange mechanism. When, in the following year, Nord Pool opened its doors, it brought a new dynamism into the Norwegian market. It affected Statkraft especially, as we shall see in later chapters.

MECCA FOR MARKET REFORMERS?

By way of introduction, I argued that the market reform must be seen, at least in the first instance, as the outcome of specific historical and institutional features of the Norwegian electricity industry. So far, my account has touched on some of the factors, which will now be discussed a little more thoroughly and specifically.

The primer mover behind the increasingly accepted idea that power could be bought and sold on the free market was, without doubt, the total Norwegian experience,

gained from early work on power coordination and especially from the power pool created in 1971. Norway's electricity sector was unique in almost every way and the outcome of an equally unique organisational structure. While reliance on large, vertically integrated corporations was the rule in most countries, the sector in Norway, as we have seen, had above all been characterised by a plethora of small and medium-sized companies. This critical organisational feature placed a strong emphasis on coordination right from the start and also stimulated the use of coordination as an effective alternative to vertical integration. In addition, the need for cooperation was underpinned by the nationwide dominance of hydropower as a source of energy (see Chapter 2). Taken together, these circumstances led to the gradual emergence of an exceptionally complex system of regulated, coordinated collaboration between producers and suppliers of power, at the regional and then at the national level. To function effectively, the power market is of course utterly dependent on coordination. In other words, even though the operators are motivated by fundamentally different factors, there are unmistakable links between the "traditional" approach and the coordination required for market trading.

The power pool set up in 1971 by Samkjøringen i Norge, the then coordinating body, is the most obvious expression of how experience gained from coordinating power usage had opened up new perspectives. Without this background, it is unlikely that an economist like Einar Hope would have developed his distinctive models for a market-based trade in power so early, indeed well before neo-liberal ideas had been widely accepted. The key operators of the new market system have also underlined the significance of this internal power exchange. In 1998, the president of Statnett spoke in connection with the fifth anniversary of Statnett Marked, later to become Nord Pool, and made precisely that point: "Norway's power exchange, and the development of a Nordic marketplace that followed from it, went off to a flying start because, ever since 1971, we had used an exchange mechanism to buy and sell power between internal producers. The experience we had gained formed a basis on which to build and, in addition, as we have seen today, a solid platform for the successful launch of Nord Pool." 28 We have also noted that many older norms and principles became part of the new ways of working, like the extensive integration of consumers into the leadership of Statnett Marked. There's no doubt that such elements helped to give greater legitimacy both to the reform *per se* and market institutions in general.

Besides, the fact that the state owned the national grid from its inception brought considerable advantages. It simplified turning the grid into a network that functioned independently of owners and operators, which in itself is an important criterion for a trustworthy marketplace in power. In this context too, countries with vertically integrated structures have had to deal with greater challenges. In such systems, where particular companies can own core networks, it is much more difficult to reorganise



holdings in the grid in a way that renders the market sufficiently credible.²⁹ The implementation of a power market had in other words been made substantially easier by Norway's decentralised organisational structure. As we have noted, when the electricity sector is to be more or less dominated by the large, vertically integrated type of company, this structural feature often complicates attempts to make market-based trading work well. In some countries it has proved very difficult to establish properly functioning markets.³⁰ Norwegian authorities did not have to deal with problems of this kind. It was first when Statkraft began to enter into alliances with other power producers, or actively bought them up, that the monopoly commission and other regulatory bodies have had to face similar problems. These are issues to which we will return in later chapters.

A view of the Nord Pool in operation; the Nord Pool was the world's first international power market. It was set in action on the 1st January 1996 to serve the Norwegian-Swedish power trade.



Chapter 9

Building a market oriented organisation

In Statkraft's annual report for 1993, the following was said about the company's mission in the context of the newly established power market: "Statkraft's trading aim is to be a preferred provider of competitive, high-quality products to our customers. It will direct our drive to intensify our market activities and entail further developments of our product range in order to meet the requirements of our customers."

his declaration was characteristic of the early phase of the market reform. Such commitments were made, in more or less the same terms, in the annual reports and strategy documents of a large number of power companies. The proliferation of mission statements represented a strongly felt need in the industry to be seen as ready to innovate and to be "proactive" in the market context. However, behind this profuse flowering of fashionable concepts and expressions lurked a real sense of uncertainty about how to best handle the new situation. It was clear to all concerned that the market reform demanded new, more active attitudes to trading, as well as new business strategies. However, the precise nature of the new strategic approach often remained largely obscure. Statkraft wasn't much better oriented than anyone else. The state-owned power company, too, was hesitant about how to find the right way ahead and get off to a good start in this new era.

To simplify a little, the power companies had two main options when it came to dealing with the new power market. They could invest in what might be called bilateral contracts, e.g., deals based on long-term agreements, negotiated directly with a particular buyer. Or, they could engage with the "organised" market that was now made possible through new spot and contract opportunities offered on the Statnett Market. While the first alternative was the traditional way to buy and sell power, the supervised marketplace was the model intended for power trading by the architects of the market reform.

During the early years, Statkraft showed little interest in using the new system and prioritised bilateral agreements. The company was more familiar with this form of managing its business. Besides, the organised market got off to rather a poor start. In the context of the dynamics of the marketplace, huge power surpluses during the first years made for exceptionally low prices. Also, the marketplace looked risky because it generated considerable price fluctuations. Even though the contractual prices in bilateral deals also fell, these straightforward agreements offered at least a modicum of certainty about future earnings. In a new, unpredictable world, this was a weighty consideration.

However, with time, traders adjusted to the organised marketplace. By the mid90s, Statkraft had come to take a keen interest in Statnett Market in general and in
the spot trading in particular. The motive was partly that prices were rising, but partly
also the creation in 1996 of Nord Pool, the joint Swedish-Norwegian power market,
which had opened up attractive new opportunities for Norway's producers. Last, but
not least, it was gradually becoming recognised within Statkraft that the company
had a strong competitive edge in organised trading, due to its unusually flexible production capacity, wide range of information about Norwegian electricity production
and advanced analytical systems, developed over several decades. Actively used to
reach clearly defined targets, these were very valuable assets in the marketplace, and

PREVIOUS PAGE: Blåsjø, with the impressive Førrevass dam in the foreground. The capacity at Blåsjø is close to 8 TWh and the generating complex is one of the most important components in the production system run by Statkraft. Because of the huge storage of water the station has great flexibility, which confers considerable advantages when trading in the power market.

Statkraft was to exploit them increasingly during the second half of the 90s.

If we evaluate Statkraft's results since the early 90s, it is clear that the company has improved steadily within the framework of the market. This is especially true of the solid annual profits after 2000, earned while the company's returns on invested capital have risen continuously until they are now regarded as very satisfactory. This development is the outcome of three circumstances in particular. First, the company has clearly managed to enhance its human and material resources to great effect. Second, it has been able to rely on production organised in a manner that has proved highly efficient in an international context. Third, it has been lucky in so far

as external conditions have now and then given it a push in the right direction. As the gap between supply and demand for power has narrowed in Norway, prices have risen and hence profits have improved on a year-on-year basis. Strengthening links to Nordic and European markets has also helped to drive profits upwards. And, crucially, Statkraft with its inherited position as a major producer of renewable energy has gained from the ever more thorough-going environmental criteria that have come into force in Europe over the recent years.



Statkraft has spent many decades on the research and development of electronic monitoring systems for the water levels in the company's numerous water reservoirs, which are spread all over the country. In the photo, the indicator at Oddatjern showing a near-maximal water level.

THE COMPONENTS OF THE ORGANISED MARKET

We have seen that the market reform brought in a dual system for trading in power: it allowed bilateral contracts and deals in the organised market under the aegis of Statnett Marked. It is worth looking a little closer at what these alternatives meant in reality.

Traditionally, as we know, power deals were arrived at by mutual agreement. Before the market reform, the power trade was principally dependent on the partners negotiating long-lasting, non-standardised contractual terms and, as a rule, the unit price remained fixed for an agreed period. This was how most of Statkraft's power trade was done.² Generally, supplier-customer relations stayed fairly constant. Statkraft sold the greater part of its production to a group of county and local authority companies in a diverse set of regions.³ The market reform affected the bilateral pattern in one particular respect: local owners of distribution networks no longer had a monopoly on electricity provision within their territories. At a stroke, it became possible for any electricity generator to enter into an agreement with any buyer, anywhere in the country.⁴ In addition, the reform helped to legitimise decisions by local companies

to re-think long-standing links to specific generators.⁵ In other words, the reform opened up a new, potentially much larger trading floor for companies with a taste for expansion. For Statkraft, the outlook was very promising. As a pure wholesaler, it had always accepted being at the mercy of the regional and local monopoly operators. The new state of affairs meant that it could sell directly to local companies and end-users everywhere in Norway, should it so wish.

The newly organised marketplace – Statnett Marked – had a quite different character from the old bilateral contract trade. As we have noted, Statnett Marked started up in 1992 (cf. Chapter 8). In the beginning, Statnett Marked was meant to run a two-fold operation, i.e., a spot and a contract-based market. Generally, the spot market was a development of the old power pool run by Samkjøringen i Norge (Coordinating Board in Norway; cf. Chapter 7) and hence a form of trading with which the sector was reasonably familiar. As in the past, the deals were made on the basis of immediate deliveries over brief periods of time. However, in the old days, deliveries were fixed for a week at a time and prices settled in advance, once the partners agreed how much they wanted to buy or sell. These prices remained for the entire week. The new spot market worked along the same lines, but with the difference that contracted duration and price lasted not for a week, but for 24 hours only; this was why it became known as the "24 hour market". Another important distinction was that the practice of setting so-called floor and ceiling prices was abolished. It followed that the prices, at least in principle, could increase to any level as well as decrease to near-zero. In other words,

Construction of Svartisen power station, the only sizable hydropower project completed in the 90s.



the spot market would allow much wider price fluctuations than the power pool had before.

Contract trading in Statnett Marked was the other, more conventional format and allowed agreements that specified future power deliveries.⁷ Initially, dates could be set up to one year ahead.⁸ The unit price was fixed and reflected demand and supply at the time of signature. In this respect, the new format had certain features in common with bilateral contracts. But, there were also obvious differences. First, in the new system prices were calculated centrally on the basis of the collective balance of supply and demand. Buyers and sellers could register how much power they wanted to trade over stated periods in the future. The prices were worked out accordingly and remained fixed for a week at a time. Second, contractual terms were standardised and couldn't become subject to negotiation, as was the case of bilateral contracts.

The spot and contracts divisions had been set up with

a primary aim to provide trading conditions with different risk elements. The dominant position of hydropower meant that the management of risk became especially important. Because the production capability of a water-powered station is unpredictable and can vary over a wide range from year to year, it was to be expected that prices would also show correspondingly large swings. In the previous pool system, generators had become familiar with the ways in which variations in rain and snowfall could affect prices. Such effects were likely to be still more pronounced under the new system. Consequently, in order to function adequately, the market relied on operators being able to insure themselves against short-term swings in the prices of products, which would in turn affect either earnings (the sellers) or outgoings (the buyers). This task fell to the contracts trade. On the other hand, the spot trading was meant to respond to conditions currently affecting supply and demand.⁹

The new, regulated market thus offered both familiar and innovative trading opportunities. But were the power companies willing to take the leap onto Statnett Marked's trading floor?

A TIGHT START FOR THE ORGANISED MARKET

The power generators initially found Statnett Marked a particularly unattractive outlet for their product. Since it first opened its doors, early in 1992, large surpluses and hence low prices, had been haunting the industry over several years. Following the reform of the market, the production surpluses had still graver consequences. The start of spot trading within the framework of the Statnett Marked led to further price reductions because, as pointed out above, the price maintenance limits were removed. The outcome could only be one: spot prices went through the floor. In 1993, the price was just 50 NOK per MWh for short periods. This was a historic low, seen by many producers as the equivalent of giving power away.

Obviously, nothing could force the generators to engage in the spot market. However, the low spot prices quickly exerted a downward pull on prices negotiated in the bilateral agreements, which were the essential bread-and-butter deals for the majority of the producers. It naturally didn't take long before buyers began to use the spot prices as levers to reduce contracted costs. Once spot prices had reached an exceptional low, sellers had to lower their prices accordingly. In addition, there was a growing trend towards doing power purchases in the spot market, rather than in the long-term contracts market. Many producers were left with quite considerable amounts of noncontracted power on their hands. Their only option was to try to shift the surplus in the spot market, and this in turn created a self-sustaining mechanism: low prices led to lower turnover and larger amounts sold in quick deals at still lower prices – a purchasers' Golden Age. In 1992, some estimates indicate that the new trading situation



View of the aluminium smelter in Sauda in the Vestlandet county of Rogaland. The smelter is owned by the industrial conglomerate Elkem. Ever since the introduction of the market reform, the issue of the power supplied to heavy industry has been causing debate. At the heart of the matter is the question of whether heavy industry can survive in the long term without politically pre-set electricity tariffs.

saved distribution and industrial companies around 1 billion NOK.¹⁰

More or less all power producers felt the impact, but Statkraft was among those hit particularly hard. In 1991, the Storting had decided that all organisations with prereform Statkraft contracts should have the right to cancel and restart negotiations. The reasoning was that no state customer should be tied to agreements set up under the old system. The contracts could, of course, be reinstated if the customer so wished, but in terms defined by current market conditions. It goes without saying that, given the market situation at the time, this ruling was very unfavourable indeed for Statkraft. In the course of the spring of 1992, all its customers took advantage of the opportunity offered by the Storting. Existing contracts were cancelled and usually renegotiated at

considerably lower prices and often also for lower volumes, as the buyers often wanted to switch a proportion of the purchasing to the spot market. The effect was to land Statkraft with large quantities of power that had not been spoken for and which had to be sold in short-term deals. During 1992, the first post-reform year, a whopping 30% of the production was traded in the spot market for very low prices.

The combination of poorer contractual conditions and spot market selling hit profits hard. In 1992, Statkraft had to cope with a loss of more than 1 billion NOK. The company executive was of course extremely concerned and started a hectic chase for new strategic options. How would Statkraft meet the challenges of the new marketplace?

STATKRAFT PUTS ITS TRUST IN BILATERAL CONTRACTS

Against the background of the crisis year of 1992, Statkraft devised a dual sales strategy. One aspect was the drive to minimise trade on Statnett Marked. In other words, Statkraft turned its corporate back on the new marketplace and, among other measures, adopted the principle that only power to be sold in the spot market had to have proved unsaleable in bilateral contract deals. The other aspect of the new policy was that just such long-term, bilateral agreements were to be actively sought. ¹¹ This reflected primarily the company's need for predictability in a new and uncertain world.

Even though the prices agreed in such contracts also showed a downward trend after 1991, Statkraft nonetheless preferred this route to the spot market

This rejection of the new (an organised market) and acceptance of the familiar (bilateral contracts) might seem defensive at first, but the strategy also had an unmistakeably offensive component. In order to succeed in the battle for customers and contracts, Statkraft invested in the construction of a dynamic marketing section. The sales department, with its longstanding remit to handle the company's contracts portfolio, saw strong expansion from the end of 1992 and throughout 1993. Traditionally, the department's main task had been to follow up and regularly renegotiate the company contracts with a relatively stable group of customers and on the basis of prices decided in the Storting. In all, this behaviour was distinctively different from that of a market-oriented organisation. Now, operating in a marketplace was the only option. In the first instance, the new sales recruits were economists, but often with previous sales experience. The intent was clear: Statkraft was going to tout actively for custom.

The new staff of salesmen and economists brought a culture and dynamism of their own. The administrative function of the sales department gradually became replaced by a trading role. The ethos was to go all out for customers, and the demand for both individual and collective results grew stronger. One manifestation of this change of culture and mentality in the sales department was the new clock that went up on a wall: it chimed every time someone had landed a sales contract for more than 100 GWh.¹³

Unquestionably, the strategy worked. In 1993, the volume of contracts increased considerably in comparison with the year before. As well as gaining new trading partners, Statkraft also saw the return of old customers who had previously started looking for deals elsewhere. The recovery continued during 1994 and included some truly large coups, e.g., the agreement with the regional electricity company Oppland Energiverk in 1994. This contract, which was actually celebrated as a terrific victory and proof that Statkraft was getting a grip on the market trading, entailed regular winter deliveries of 2.5 TWh until 2000. All in all, the sales department managed to tie up increasingly greater proportions of the power output into firm, long-term contract packages. This made for more accurate forecasts of turnover and at the same time reduced dependence on the spot market. As important was the boost of the company's financial situation. As the Annual Report for 1993 put it: "The larger trading volume, taken together with increased contract-based sales, has resulted in greatly improved financial outcomes." The next goal was more of same: further growth in the amount of power sold through solid, bilateral agreements.

Yet another element in company strategy during these early years was the emphasis on power exchange deals with foreign countries. This too helped Statkraft to achieve better predictions about future turnover. The "exchange agreements" specified the

NEXT PAGE: A picture from the early 90s, showing the laying of the "Skagerrak-III cable" between Norway and Denmark. Following the market reform and the international integration of markets, the stress on transmission links with other countries has increased.





buying and selling of power in two-way deals within an agreed context, which explains the meaning of the term. They were particularly suitable when the partners produced respectively hydro- and thermal power. We have already touched on the usefulness of collaboration between these two forms of energy production (Chapter 2) and noted that, since the early 60s, such agreements have greatly assisted the push towards closer collaboration between the Nordic countries (Chapter 6). During the first part of the 90s, the sales climate was especially favourable for these collaborative ventures, because of Norway's large surpluses, which meant that power could be exported at reasonable prices to countries dependent on thermal energy.¹⁵

Statkraft worked hard to set up exchange agreements. In 1993, it signed contracts with the German company Preussen Elektra and the Dutch SEP, although the deals would not come into force until respectively 1998 and 2001, when new transmission links between the countries involved would be completed. The following year, Statkraft also took over responsibility for an older agreement between the Norwegian state and the Danish company ELSAM. In each case, the run-time was 25 years, a fact that was thought to play a very important part in the efforts to stabilise the business outlook. Indeed, Statkraft made no secret of intending to enter into more agreements of this type in the future. In 1993, CEO Lars Uno Thulin argued that exporting up to some 15 TWh annually, i.e. over a tenth of Norway's total production, should be perfectly achievable well before 2010.

CHANGING STRATEGIES

The emphasis on long-term contracts and power exchange agreements – the drive to lock up as much of production as possible in lasting, stable deals – was easy to understand in the context of the market conditions that dominated the first half of



Lars Uno Thulin, the Statkraft CEO between 1991 and 2001, who was in charge during his organisation's transition from a civil service department to an expansion-oriented operator on the international power market.

the 1990s. Even so, there were those who criticised this strategy. Doubtlessly, the low prices were problematic, but it was uncertain for how long this would last. A period of low precipitation would quickly push the prices upwards. Also, there was every reason to assume that the Norwegian surpluses would gradually shrink, given that power station construction had all but ceased during the completion of the market reform programme. The effect would presumably also entail price rises. The point made by the critics was that it could become very unfortunate to have tied up large parts of future production on fixed terms, which included low prices.

Such views were expressed above all within the section of the company that was responsible for production. It managed the entire organisation of power production and was of course very familiar with the conditions for power generation and power demand within the system in its entirety. Through Statkraft's long engagement in the old power pool, the production staff had acquired a quite wide-ranging insight into what affected prices in a hydropower-dependent nation like Norway. One prominent feature of the old system had been the large price swings that could occur from one year to the next. At the time, Statkraft had been the superior operator by far, not least because it had spent large resources over many years in order to acquire the competence and the tools needed to analyse and predict future states of the market and levels of power prices. The production section was sceptical about the determined push towards long-term contracts for reasons based on its past experience and forecasting skills.²¹

Already in 1994, events seemed to confirm this view. Due to lower than normal rainfall and a relatively cold winter, Statnett spot prices shot up, with an especially sharp rise early in the year. In February, the price per MWh had topped 200 NOK for the first time since 1991 and in March, reached 354 NOK. Later, the unit price declined again, but not to the low of the previous year. As a result, the average for 1994 was higher than before: 182 NOK, while in 1992 and 1993 it was respectively 57 and 80 NOK.

The changes observed during 1994 suggested that the spot market might have a much greater trading potential than generally assumed. True, the spot prices fell again in 1995, but 1996 began with even less precipitation and even higher short-term power prices. That year saw the price per MWh reach 358 NOK and the average price 250 NOK. This new pattern greatly increased the power producers' interest in the spot market. Instead of regarding it as the dumping ground for unsold power, they were coming to think of it as offering strategically interesting and potentially profitable investment opportunities. Statkraft's executives were among those who redefined their attitudes at quite an early stage. Of course, it wasn't a case of losing interest in bilateral contracts overnight. But the spot market and later also the regulated contracts market took up a much more central position in the company's sales strategy during the second half of the 90s, and especially during the next decade.²² This was part of increasing industry interest across the board, as is clearly shown in Fig. 1 (below).

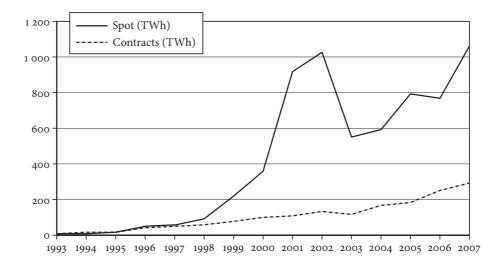


Figure 1 Trade data for Statnett Marked / Nord Pool 1993–2007 (TWh) Source: Annual reports, Nord Pool

STATKRAFT'S COMPETITIVE ADVANTAGE IN THE ORGANISED MARKET

There was, and still is, an essentially two-fold approach to being successful in the new power marketplace. It depends on ability to predict supply and demand, and hence prices, for weeks or, better still, months ahead. It also entails both the capacity and the opportunity to adjust production in line with those expectations. That the overall productivity of generating stations is determined, not only by capacity limits, but by precipitation at any one time, is a problem of systems dominated by hydroelectricity, such as Norway's. The greatest gains go to companies which consistently manage to forecast when the best profits are likely to occur and control the water supply, so that they have the largest quantities in store at times of shortages.

Gradually, Statkraft staff grew alert to how well the company was placed with regard to both these criteria. Its generating stations were unusually flexible with respect to production and water storage. Because the company had had the main responsibility for the national power supply before the introduction of the market reform, it had set about constructing several so-called multi-year dams with very large storage capacity. The rationale behind such systems was the need to secure power supplies during dry years. Traditionally, Statkraft had put great stress on storage capacity and the result could now be observed in the relationship between output and storage: the company controlled some 30% of the total Norwegian output, but well over 40% of the storage capacity. This put Statkraft in an exceptional strategic position with regard to operating in the power market.

Statkraft was the only generating company with stations in every part of the country, situated along almost every large watercourse. One of the advantages was that the geographical spread also provided a flow of information that was of better quality than that available to other power producers. It was to become very important in the



context of the market. Statkraft not only owned generating capacity, but also had access to an unrivalled source of data relevant to production. This included temperature, rain- and snowfall variations, snow-cover and rate of melting, as well as general information on the flow-characteristics of watercourses, i.e., the normal variations during the year. The larger the amount of data available to a hydropower producer, the more accurate is the overview of the possible rate of production of the entire system. When it came to trading in a national power market, this collective capacity determined prices. In other words, such information was of great strategic importance.

A third reason for Statkraft's superiority was the large investment, made available over several decades, that had gone into creating and refining analytical and operational models, which could draw on the large dataset. The models would prove very useful for calculating electricity sales in new markets. Before the market reform, the chief goal of the modellers had been, in simple terms, to design company guidelines for managing power stations in such a way that there was enough output at times of high demand, but on the other hand no overflowing storage dams, when demand was reduced. In other words, the system had not been developed with market trading in mind. However, the function of the models – to find optimal operational conditions relative to crucial factors such as stored water volumes, levels of precipitation, rates of product usage and temperature variations – turned out to be hugely valuable in the context of the market. As discussed previously, success in the marketplace arises from the company's ability to make educated guesses about future supply and demand.

View of the so-called Hall of Mercury in Statkraft headquarters in Lilleaker, not too far from the centre of Oslo. The trade in electricity is managed from here.



Maintenance at the Korgen power station in Nordland, one of the smaller units in Statkraft's portfolio.

Because of its access to a wide range of information and advanced analytical tools, Statkraft was unquestionably better placed in this respect than any other Norwegian power producer.

As Statkraft began to show increasing interest in marketplace trading, the worth of information and analytical skills was coming into focus. "With the power market in a constant state of flux, it is now more important than ever before to act on the basis of good information, analysed with the most sophisticated tools, in order to make the best of the water resources available to Statkraft," as a company statement emphasised early in 1995.²³ From this point in time onwards, the com-

pany invested deliberately in building up a strong professional analysis unit. Also, considerable amounts of money were spent on developing the existing hardware and software. The goal was to achieve an ability to "dispose of all our water resources optimally, with regard to both our production capacity and price expectations." ²⁴

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. Actually, the use of these assets was not without its problems. For instance, the state supervisory organisation NVE (Norges vassdrags- og energiverk) pointed out that access to the watercourse datasets amounted to a considerable advantage over the competition. Statkraft alone could use this constantly updated system, which was so critical in the context of the market trading. NVE drew the conclusion that the data should be official and available to all. The proposal received only partial approval. Statkraft's arguments against free access included the observation that the company "next door", the Swedish Vattenfall, which held approximately the same position in Sweden as Statkraft in Norway, has not faced this criticism. It also pointed out that every power company had been free to create their own information banks. Some companies had planned to do just that, but no one had actually done it. Still, there can be no question about Statkraft's pre-existing

advantage. It would always be costly to create a comprehensive system on such a scale. Besides, it would be of very limited use unless the company owned generating capacity along the selected watercourses.

FROM ADVERSITY TO FORTUNE

Looking at the sequence of Statkraft results from the early 90s onwards, its success as a trader in the power market is obvious. To simplify a little, we might start by identifying three stages during this period. The first lasted until the mid-90s and was characterised by recurring, large deficits. The second half of the 90s was a stage of recovery and only modest surpluses. The third stage started around 2000 and occasionally brought large surpluses as well as markedly increased returns on capital, in comparison with the past (Figs. 2 & 3, below). How to explain this development? During the first half of the 90s, Statkraft's position was very much affected by the unfavourable market climate, affected by large power surpluses and low prices across the board. It hit the company hard, when taken together with the unravelling of existing contracts in 1992 and the right of the customers to renegotiate prices and product volumes. In the absence of contracts, the company also found itself landed with large amounts of power which had to be sold on the spot market at very low prices indeed. From about 1995 onwards, the improvement in results were due in part to a successful drive to increase activity in the regulated market. Also, the spot market prices rose during the second half of the decade and contracted prices followed the trend. Another key development during this period was the establishment in 1996 of Nord Pool. It not only gave Statkraft a much larger number of potential trading partners, but also allowed

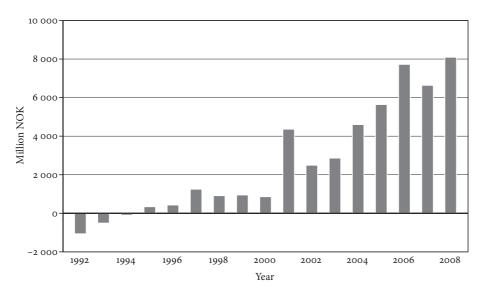
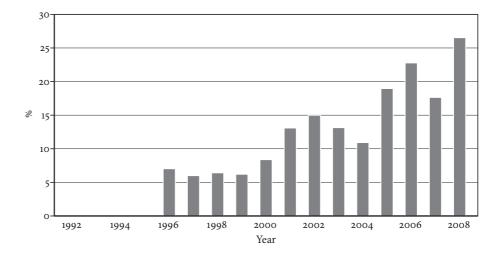


Figure 2 Statkraft's annual results after tax 1992–2008 Source: Annual reports, Statkraft

Figure 3
Return on average capital assets before tax
1996–2008 (as percentages)
Source: Annual reports, Statkraft



it to operate in a market where the great flexibility of Norwegian hydropower was an especially valuable asset.

It is also right to emphasise the extent to which the greatly improved company results after 2000 were dependent on a growing ability to relate sophisticated in-house skills in market analysis to a flexible production system. Statkraft's advantage over its competitors in this area had become more important as the integration of the Nordic power market progressed and, with time, also became more tightly linked to the European power trade. Thermal power forms the backbone of the European power production, and the adaptable, efficient supply of hydropower was becoming increasingly valued. Also, the spot market prices settled at a higher level after 2000 (cf. Fig. 4). Earnings rose across the board as the rise in spot prices fed back into the contracts trade. When the 2006 company results beat past records, it was an effect very much related to the fact that the average price had reached its highest level ever.

AN INTERNATIONAL DEVELOPMENT THAT SERVES STATKRAFT WELL

Even though the marketplace has become increasingly international, the level of rain and snowfall is still a dominant factor affecting Norwegian power prices. Low precipitation figures drive the prices up, occasionally steeply, as in 2003 and then again in 2006. This fact has a crucial implication: forces outside the control of the producers, including Statkraft, dictate their annual profits.

But over the last few years, there has been a discernible shift in the commercial response, suggesting that wet years causing smaller price reductions than before. 2005 provides one clear-cut case of spot prices reacting only moderately to one of the wettest years since the 1920s. Actually, the average market price for that year was not

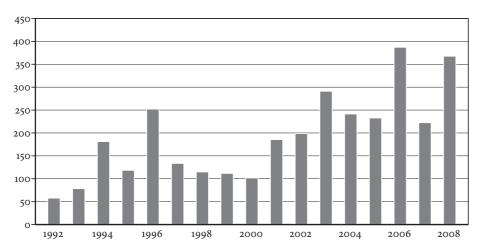


Figure 4
Average power prices in Statnett Marked / Nord
Pool 1992–2008 (Kr/MWh)
Source: Nord Pool

strikingly lower than in 1996, which was one of the *driest* years since the 1920s. What might be the underlying cause of this trend towards more stable prices?

Electricity price stabilisation can be understood in the context of increasing international trade. That prices no longer fall sharply during a wet year is to a large extent due to Norwegian sales forces having access to the Nordic and, increasingly, to the European markets. For as long as Norway's power industry remained isolated, which was essentially the case until the mid–90s, it was often hard to find buyers in wet years and this led, as we've seen, to very low spot prices. However, the growing inter-Nordic market seems to serve as a buffer against large swings in the total amount of power for sale and hence prices stabilise. Interestingly, rising Nordic demand in recent years has put pressure on the power supply side, which also tends to prevent prices from falling, even in years of heavy precipitation.

An obvious effect of relatively greater market stability is to reduce the financial risks for the generators, compared with what they faced during the early stage of the market reform. Rain and snow are no longer factors with major impact on short-term prices, although precipitation of course still has its effects on trade, price levels and earnings. But the links to Nordic and European markets, in combination with the tighter power balance, is dampening down the effects of changes in climate. Instead, it looks as if price and traded volume in fact are counterbalanced. In the past, wet years meant low prices, unsold power and hence low earnings, but now the higher incomes gained from raising turnover can apparently compensate for any decline due to falling prices. In other words, it looks as if there is now some kind of unforeseen linkage between price and volume, since power can be sold at reasonable prices even at times of high production. In the wet year 2000, Statkraft provided a typical case: the company produced and sold 20% in excess of its mean production volume, without any marked change in profits. Or, as the Annual Report of that year explained: "One consequence



1996 turned out to be the kind of year that is the most feared in Norway's electricity industry: the rain didn't fall and, overall, it was the driest year since 1941. And it showed, as in this photo of the reservoir at Rogaland in Vestlandet.

of the greater supply is lower prices, but in view of the very good exchange capacity with neighbouring thermal power generators, price trends show less weakness than expected from the increased production rate. Hence, increased precipitation has not had any negative business outcome for Statkraft." ²⁵

If the market settles down to trading at higher and more stable prices than before, producers like Statkraft will benefit in particular. It is of course advantageous for all power producers if wet years no longer cause prices to fall. But it is especially lucrative for hydropower producers, because their generating costs are almost completely fixed. Power generation dependent on coal or gas will invariably incur higher expenditure on fuel if production volume is increased. However, increasing the output from hydropower stations will cost, at most, only marginally more, because the energy source – the flowing water – is available "for free". As a consequence, higher production translates directly into higher net earnings. In this way, hydropower producers in general profit more from rising power prices than do their thermal power competitors. ²⁶

Last, but not least, in Nordic and European markets an increasing emphasis on environmental policy has contributed to the steady rise in Statkraft's annual results.

One important factor is that Swedish nuclear power generators have started to run down production during periods of falling prices. Norwegian hydropower generators have profited. When the European Union signed the Kyoto agreement in 2005 and implemented the subsequent introduction of CO_2 emission charges on generating stations, it had an indirect effect on Statkraft's results. The cost of CO_2 emissions has in turn increased fuel costs for thermal power producers and therefore led to rising power prices also in the Nordic marketplace. These are some of the aspects of an international situation which might make the 2005 results the best ever for Statkraft, even though it was a mild year and the rainfall figure above normal.

To summarise, my conclusion is that the growth of Statkraft's business during the last fifteen years are due to a combination of active and skilful adaptation to the new Nordic and European markets and developments in the marketplace for power, which to a great extent and in several different respects have served a hydropower producer like Statkraft very well. There are few indications that these factors will become less advantageous in future years and much to suggest to the contrary. The steady growth of profits has increased the company's financial freedom of action. In chapters 11 and 12, we will look at how this freedom has been used, among other things, to expand Statkraft through buying up, or establishing new businesses in Norway, Europe and other parts of the world.



Chapter 10

From political tool to commercial enterprise

"With regard to the resources of the state currently managed by Statkraft SF, the organisation has changed gradually and in parallel with developments in society as a whole and in the power market in particular. [...] Once freed of political responsibilities in the energy sector and now subject to a changed law on state-owned enterprises, Statkraft has quickly come to play a distinctive role as a purely commercial operator, trading on the same basis as its major competitors in Norway and other Nordic countries."

n 2004, with a free power market up and running, this was how Statkraft's change of identity was briefly described to the Storting. The matter in hand was the Bondevik government's proposal to turn the state-owned organisation into a limited company. Restructuring would move it one step closer to full commercialisation. Not long before, the Bondevik government had also let it be known that it was considering part-privatisation of the company.²

It followed directly from the liberalisation of the power trade that Statkraft should be a commercial operator. The presumption that all agencies involved in power trading, including Statkraft, should be guided solely by business profitability is integral to the ideological basis of the market reform. True, there were those who still insisted that Statkraft would remain the caretaker of the sector's specific political concerns. Representatives of heavy industry and the labour movement demanded that Statkraft should continue to provide industry with power at politically approved rates. Others argued that the state ought to use Statkraft as an instrument to serve environmental policy aims and, for instance, instruct the company to invest in the development and construction of renewable energy sources. However, there was little appetite for these ideas. Even the social democratic Arbeiderparti had become deaf to the demands for cheap power from the heavy industries. And, despite every government since the mid–90s speaking warmly about Statkraft's environmental potential, not one of them tried to instruct the company to invest more heavily in renewables than the company itself considered appropriate.

In the wake of liberalisation, Statkraft has anyway become largely depoliticised. Partly, this was a consequence of Norway agreeing to collaborate with the European Union (EU) and join the European Economic Area (EEA). By signing up to the EEA, Norway became subject to the EU competition laws, which have gradually led to new limits being imposed on national policy-making in areas such as economics and environment. For example, the state is no longer free to use ownership as a political tool. Norway has had to accept dictates from EU about several key aspects of energy policy, including decision-making structures in Statkraft and power supplies to heavy industry. But although this has occasionally meant acting against national preferences, the policy constraints are probably just as much due to the widespread and growing support for the logic of the marketplace at the expense of political direction. Currently, maximising business profit is prioritised also in related areas such as investments in environmentally acceptable sources of energy.

This development raises a crucial question: If Statkraft no longer has any goals other than maximising earnings, what is the point of state ownership at a time when both the acceptance of the profit motif and the current forms of regulation of state enterprises make them less and less distinct from ordinary businesses? What would distinguish a private from a state-owned Statkraft except for – presumably – its name?

PREVIOUS PAGE: Maintenance of the 950 meters-long pipeline at Glomfjord power station in Nordland.



This chapter is a review of the transformation of the company from political to commercial operator during the 90s and includes a brief examination of current ideas about state ownership.

Tysse power station in Hordaland county was one of the first large power stations build to supply heavy industry. It came on stream in 1908. The power was used to produce carbide.

A GRADUAL PROCESS

The establishment of a marketplace for power and the removal of Statkraft from political control have both been gradual developments. At the time when energy legislation was introduced in 1991, it didn't seem particularly likely that Statkraft would lose its political function in the energy sector. That its civil service and business-related tasks were to be kept further apart than previously was made very clear, but there was no hint that its administrative work would cease. True, the Oil and Energy Ministry argued from an early stage that some of the administration least suited to the main business was to be transferred to other agencies, in particular, the responsibility for the nationwide transmission grid. The department also let it be known that, once the current agreements ran out, Statkraft should no longer be required to sell power to

heavy industry on politically pre-determined conditions.³ We have already noted (Chapter 8) that in 1992, a separate state-owned company was created to manage the national grid. However, in matters concerning heavy industry, the Oil and Energy Minister did not go along with what was then current political thinking. In 1991, a large Storting majority decided in favour of Statkraft continuing to sell to industry as before and backed this with a detailed bill.⁴

The decision that heavy industry should be allowed to trade under conditions that were different from – that is to say, better than – those obtaining in the market, was contrary to the thinking behind the market reform. Indeed, not every member of the Storting was eager for this practice to continue. But the majority felt that social considerations left them with no choice. Since WW2, the state had encouraged a whole spectrum of energy-dependent industries to grow and offered them cheap power provision by its own producer. A radical change of the operational conditions for industry seemed unacceptable. Besides, these were in the main enterprises which meant a lot to local people, because they were mainly located in the provinces and especially in areas with a relatively narrow economic base. Changing the industrial framework could have damaging effects on these communities and hence the Storting majority wanted to control power provision also in the future.

The perceived need to keep using Statkraft for political ends directed the choice of structure. In 1990, the centre-right Syse government carried the market reform laws, which included the provision that Statkraft ought to be a limited company. It was the most appropriate structure, given the consensus that its primary goal was to operate as a business. Besides, the "limited company" was widely recognised abroad, which mattered at a time when negotiations were underway about Norway's association with the European Economic Community (EEC). The government argued that the community-wide rules on competition required transparent state enterprise structures, which effectively separated civil service and business functions. 6

But when the politicians debated Statkraft's future structure in 1991, the centre-right was no longer in charge. A leftwing Arbeiderparti government under the leadership of Gro Harlem Brundtland had been voted in. This shifted political opinion decisively towards scepticism about turning Statkraft into a limited company, although a strong concern remained about how to keep the business and administrative activities of the company apart. The majority party felt that a share-based format left too little scope for political control. In other words, the Brundtland government was looking for a structure that would suit Statkraft's commercial operation, but present no obstacles to political intervention whenever it might seem useful.

The Brundtland government solved the problem by creating a specially adapted structure for state-owned companies: the Statsforetak (abbreviated SF), i.e., State Enterprise. The intention was to meet current demands that the state-owned company's

activities should be efficient and commercially viable, but also to allow for political direction. With respect to owner management, financial independence and board-based decision making, the SF model had much in common with an ordinary limited company. But the state enterprise was also related to its major owner in ways that crucially limited its freedom of action. State enterprise regulations also ensured that an SF could not go bankrupt and that, if it ever were to be run down, the state guaranteed all its debts and other obligations.

Statkraft was restructured with effect from 1 January 1992 and became Statkraft SF. The company was now substantially freer to act than before – and about time, too, from the collective point of view of its directors. Perhaps the most welcome freedom was the financial liberation which came with its new status as an independent legal entity, which meant that Statkraft's finances were no longer tied to the Storting and the state budget. As for the rest, it was not too hard to make clear distinctions between business and administration. Because Statkraft SF was primarily asked to operate as an ordinary business, it was also a good idea to define from the start precisely which actions lacking good commercial foundations would be politically required.

PRESSURE ON THE INDUSTRIAL POWER SUPPLY SYSTEM

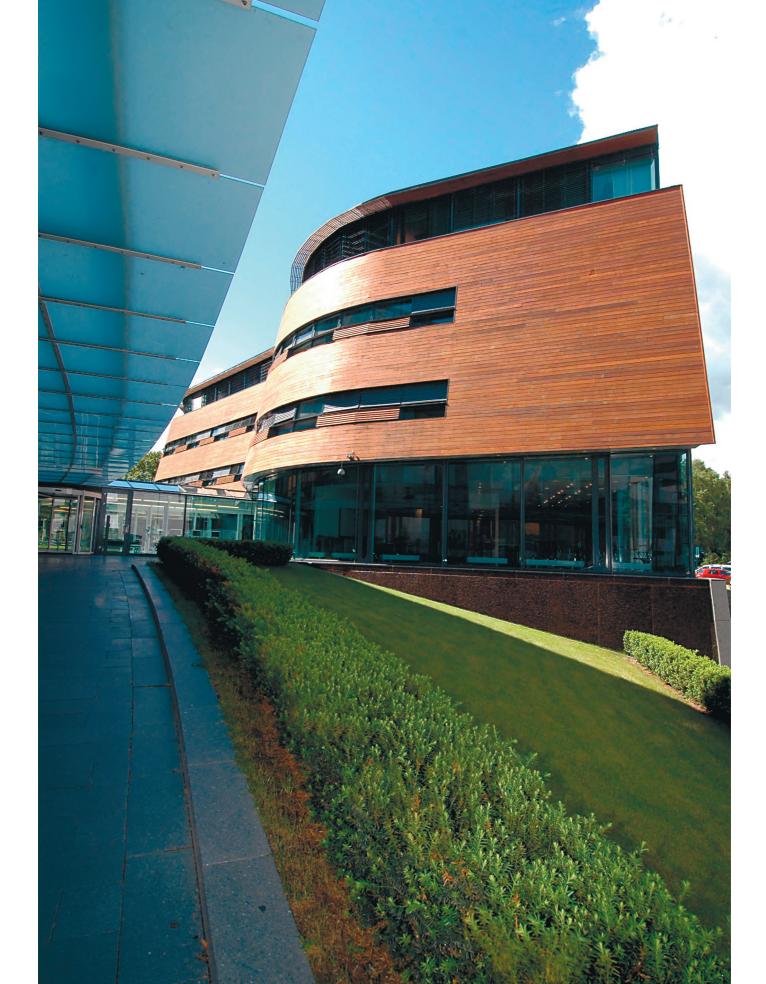
One such political requirement, which the Storting was keen to continue, was that Statkraft should supply heavy industry with cheap electricity. How did this instance of political control turn out in practice?

In 1992, Statkraft supplied around 16 TWh to large industries on the basis of terms defined by the politicians. This

amount was nearly half of its total production and approximately 15% of the national consumption that year. It was clearly a matter of major importance, both to heavy industry and to Statkraft. However, in view of the majority attitude in the Storting and at this, the very first stage of the market reform, prospects for heavy industry looked bright. Everyone expected the cheap power policy to carry on in the new age of market trading.



At times, a power station can be put to good use as a concert hall. The picture was taken at a concert in the Tysso station during the Hardanger music festival in 2006.



There was hardly any public debate about the industrial power supply during these early years. Above all, it was because the majority of the contracts were due to expire in the period 2004–2011 and still had a relatively long time to run. But in the late 90s, Kjell Magne Bondevik's centre-right coalition government took a closer look at the question of the future industrial obligations of the state and hence of Statkraft. A few enterprises with contracts close to the expiry date triggered the concern. In the spring of 1999, a document presented to the Storting reported thoroughly on the issues in principle, as well as in practical terms. ¹⁰

The Bondevik government wanted the whole system of political contracts to be gradually dismantled. Its concrete proposal was to offer industry a final package of old-style contracts, set to begin in 2001 and to run for 20 years. By 2021, heavy industry would buy power in the marketplace on the same terms as other consumers. It also suggested that, in order to coordinate the phasing out, all Statkraft's contracts with industry should be renewed at the 2001 start-date. As we have observed, the typical duration was longer and the prices agreed were relatively low.¹¹ In all such cases, any losses to industry were to be avoided by including the old set price in the new contracts, for a period equivalent to however long the previous contract would have lasted.

In other words, the Bondevik government had decided to manage the run-down of the old system by temporarily renewing the existing contracts that defined power sales to industry. No programme like this had been launched before. The dismantling process had be over a long enough time to give businesses and communities every opportunity to get used to managing without political protection. To some, the proposal seemed nonetheless radically at variance with the intentions of previous governments. Why this break with the past? How was the proposal received?

The new initiative was intended to meet several concerns, but the driving force was a deep and growing distrust of offering special terms and conditions to selected power consumers. After the introduction of the market reform at the beginning of the decade, there was widespread uncertainty about how well it would work. As experience accumulated over time, it seemed clear that the system was functioning well, and the willingness to protect specific user groups declined. In a few years, many power-dependent industries had already negotiated contracts on good terms in the market place. It was taken as incontrovertible evidence that the market could work as a valid alternative to the old, politically contolled system.¹³

Other factors of a more short-term nature also affected the attitude of the government. One such was the contemporary situation for power producers by the late 90s. There were concerns about the balance between the supply and demand for power, as discussed in chapter 9. In 1996 and 1997, Norway experienced power shortages and large amounts had to be imported to maintain supplies. A debate about how to best use the country's resources started up in the wake of the imports. Heavy industry

Statkraft recently moved into its sparkling new, modern headquarters in Lilleaker near Oslo.



The Statkraft head office building features many artworks. This mural entitled Blue Sky is the work of the English artist Hamish Fulton and recreates Fulton's impressions from a series of visits to Nepal in 1998. Statkraft has been involved in a hydropower project in Nepal since the early 90s.

was the single most power-hungry sector and naturally attracted particular attention, partly also because the industrial sector was reputed to waste energy. The assumption of wastefulness was allied to the fact that industry had always had preferential access to cheap power, and that a low price is no incentive to economise. This argument suited two of the ruling parties particularly well. Venstre (Left) and Kristelig Folkeparti (Christian People's Party) were both keen to be seen as environmentally conscious.

The expectation that the leftwing opposition parties in the Storting and notably the Arbeiderparti, would dislike any attempt to stop the preferential treatment of industry, turned out not to be the case. The Arbeiderparti and the opposition generally were especially mindful of local authority concerns and strongly agreed that the changeover must be gradual. Many small communities were dependent on their local factory. The Storting Committee on Energy and the Environment stated in its response to the government's proposal: "These are industries which can often make or break the local economy, and so the community as a whole." But the government had already taken this on board. As for the rest, the opposition parties supported the proposal in principle. Within the Arbeiderparti itself, the idea of subsidising heavy industry was on the wane and, at the same time, the market system was seen as more acceptable. Also, a pro-environmental group inside the Arbeiderparti was growing

larger. ¹⁵ The politicians were almost united in their approval of the Bondevik government's proposal and, by the summer of 1999, it was accepted more or less as it stood. The vote sealed the fate of the old-style "cheap power for industry", a regime that had lasted for more than 50 years and been hugely important for the post-WW2 development of the entire energy sector. But the final decision of the Storting was in no way the end of the affair.

LIMITATIONS ON THE NATIONAL FREEDOM OF ACTION

In 2000, the European Free Trade Association (EFTA) approached the Norwegian civil service through its Surveillance Authority (ESA). The authority was interested in taking a closer look at the model industrial contract that the Storting had voted for the previous year. The environmental organisation Bellona had prompted the inquiry by making a complaint to ESA. Bellona, an influential campaigning group, argued that, in practice, the new regulations about contractual energy prices amounted to permitting state subsidies. In particular, the organisation objected to the initial period of low prices as compensation for the forced expiry of the old contracts. ESA agreed and insisted that price regulation distorted competition. Instead, the market prices should apply from the word go and, unless this was enacted, ESA warned that it would take the Norwegian authorities to court. ¹⁶

Parliamentary elections followed soon afterwards; the centre-right parties lost, and a new Arbeiderparti government was formed under the leadership of Jens Stoltenberg. The ESA complaint landed on Stoltenberg's desk. His government, as well as the relevant department of state, the Oil and Energy Ministry, felt that the Authority had got it wrong. Nonetheless, they decided that its directions should be followed, because a court case might become very drawn out. While the case rumbled on, industry would be hopelessly in the dark about its future energy supplies.¹⁷ The government also believed that Statkraft would suffer in such an open-ended situation. It took them less than a month to formulate a new model contract based on the premise that industry would pay the market price for energy from Day 1.

It was an awkward issue, and especially so for the Arbeiderparti. Both heavy industry and local communities regarded the party as the natural source of active support in cases such as this. Industrial chiefs, as well as representatives of industry-dependent organisations and local authorities, criticised the government sharply for caving in so quickly to ESA's demands. Responding to the criticism, the Arbeiderparti has not given up on the promise to supply industrial power on special conditions. In 2005, for instance, the party launched the idea of a separate, regulated market for industrial power. In the autumn of that year, once the party had formed a "red-green" coalition government together with the Senterparti (Centre Party) and the Sosialistisk



Statkraft, like many other contemporary, marketconscious businesses, sponsors a remarkable range of causes in sports and culture. This is the Norwegian sportsman Emil Hegle Svendsen in action at the winter biathlon World Cup competitions at the 2009 World Championships. Svendsen won his stage of 12.5 km pursuit race.

Venstreparti (Socialist Left Party), their joint political manifesto included the aim to "investigate and then establish a market for industrial energy." ¹⁸

However, was it possible to deal positively with the industrial problems without at the same time courting conflicts with the ESA and the EU laws on competition? A group of experts was charged with investigating a possible industrial energy market and concluded in a 2005 report that it was probably not a realistic option. Few producers seemed keen to trade in such a market and, anyway, the experts found it hard to define in what sense the new format would be different from the existing marketplace. Other possible solutions were dismissed by the ESA, which throughout has kept an eagle eye on the proceedings. ²⁰

This persistent source of conflict has

clearly been troublesome for the Arbeiderparti, which is still taken to task by industry and the trade unions for breaking its promises. The lack of long-term future power contracts has also been bad news for the industries, because they have been unwilling to enter into new agreements in the absence of firm guidelines. Last, but not least, it has been bad news for Statkraft, too, whose relationship to heavy industry remains obscure.

There has also been a certain amount of political pressure on Statkraft to draft contracts which industry would find acceptable. This is one among many reasons why, during the last few years, the company has started up negotiations with an array of large industries; not that these talks have had any outstanding results so far, because Statkraft is forced to stand by its formal requirement to always operate on strictly commercial terms. Also, the industry chiefs have hung back, mainly because of the continuing uncertainty about the possibility of a regulated industrial power market, but also because they hope that the politicians will finally decide to demand that Statkraft enters into contracts not linked to market rates and conditions.

Over the last few years, the lack of clarity has also caused an increasing number of industries to opt for entering into commercial contracts. As early as 2005, Statkraft negotiated such agreements with Fesil Rana Metall AS and with Rio Doce Manganese, both to last until 2020. In the autumn of 2008, Vattenfall in Sweden signed a huge

contract to deliver power to the Norsk Hydro aluminium smelters in Norway. The contracts have been particularly valuable to the Arbeiderparti, because they back its contention that it is possible for industry to arrive at good terms even in a commercial setting. It was hardly accidental that, on the day the agreement between Hydro and Vattenfall was announced, Prime Minister Jens Stoltenberg made precisely that point in the media. ²¹ If the Arbeiderparti found these new contracts useful, so they also made it easier for the government to put the idea of an industrial power market on the backburner. In any case, such a market will probably never come into being, because EU rules on competition are growing ever more stringent.

STATKRAFT BECOMES A LIMITED COMPANY

Other aspects of the EU competition rules have also had fundamental effects on Statkraft more recently. In 2001, the Norwegian authorities were once again contacted by ESA. This time, the inquiry concerned the company structure of Statkraft. ESA was of the opinion that the so-called state enterprises – statsforetakene (SFs) – were regulated in ways which were contrary to the EU competition laws. In particular, ESA disliked a clause in the Norwegian Law on State Enterprises (Lov om Statsforetak), which stated that the state would fully guarantee the financial obligations of the enterprise.²² ESA considered the role of the state as ultimate guarantor unfair to ordinary businesses, because this provision made it risk-free to lend money to state enterprises and they could hence count on especially good loan conditions.²³ The backing by the state provided its own enterprises with an advantage over rival companies, which in other words should be regarded as a state subsidy.24

After the election in the autumn of 2000, Jens Stoltenberg's Arbeiderparti was ousted and Kjell Magne Bondevik formed his second government on a the basis of a centre-right coalition (Bondevik II). This change had a critical effect on the outcome of the new looming conflict. Of course, the issue at stake was much less complex than "cheap power for industry". It would probably have satisfied ESA to see the guarantor clause dropped, which might have been the decision of the Stoltenberg cabinet. However, Bondevik II aspired to something more radical and, in 2002, decided that Statkraft was to be reorganised into a limited company.



Statkraft also sponsors the annual Oslo jazz festival.

There were two main reasons for this move.²⁵ Firstly, being a limited company was the safest way to ensure that there were no further confrontations with the ESA. Secondly, it was felt that Statkraft would benefit. As the power sector was becoming more globalised, it was important for the company to conform to a structure with which rivals and possible partners were comfortable. As an organisational model, the state enterprise was little known outside Norway.²⁶

EU regulations and globalisation both mattered a great deal to the government. But there were also ideological motives behind the restructuring proposal. Bondevik II differed from "Bondevik I" because, among other things, the previous coalition partner Senterpartiet had been replaced by Høyre (Right). Høyre has a long parliamentary record of clearly expressed scepticism about state enterprise and ownership and its participation in government strengthened the Bondevik II stance as a pro-business group of liberal policymakers. The joint manifesto sent out early signals of a more critical attitude to state involvement in business. Now, the emphasis was on organising state activities along the same lines as private enterprise, including a firm intention to scrutinise the whole principle of state ownership and, possibly, to run down state enterprises that lacked a distinct political foundation.²⁷

In many ways, Bondevik II represented a watershed in the Norwegian debate about the organisation and function of state ownership. It was the first government since 1945 to flag up an unmistakably ideological and goal-oriented intention to deconstruct the role of state ownership in enterprise. This line of argument had wide-ranging consequences, not least for the on-going debate about the status of Statkraft.

NEXT, PART - PRIVATISATION?

In 2004, a proposal to change Statkraft into a limited company was presented to the Storting. Unsurprisingly, the leading parties on the left – the Arbeiderparti and the Sosialistisk Venstreparti – objected strongly. True, the Arbeiderparti did not reject in principle the application of this kind of structure to state enterprises. After all, the party had backed partial privatisation of some large state businesses, e.g., Telenor, the previously state-owned telecommunications monopoly. But, in the case of Statkraft, the Arbeiderparti was consistently opposed to change, including restructuring it into a limited company. Both the Arbeiderparti and Sosialistisk Venstreparti argued that such a change would only make it easier to privatise the company the next time round. The fear was well grounded. Among other clues to its intentions, Bondevik II had hinted to the Storting in a 2002 legislation proposal called *A Smaller and Better Form of State Ownership* that it had in mind to part-privatise Statkraft.²⁹

The left-of-centre distaste for the privatisation plan was based on the perception that, through being in charge of hydropower, Statkraft managed a quite unique

resource which should be subject to ownership and control by the people. Waterpower issues in general, and the Statkraft-owned watercourses in particular, were matters of "very great importance to the nation as a whole", according to a document produced by the opposition parties. They went on to declare that to hand over such assets to a limited company would "jeopardise the control of our hydropower resources and provide opportunities for privatisation and possibly foreign buyers (and owners) of our most important power producer. In summary, they believed that Norwegian hydropower must not end up in private, let alone foreign hands.

There was indeed some support for this view within the Bondevik government and also no enthusiasm for a sale of the state's waterpower assets. The 2002 statement on ownership (referred to above) emphasised Statkraft's specific skill-set and the government's wish that it should remain in Norway's possession, as should the state's hydropower assets *in the main*. That Statkraft provided the state with considerable tax and dividend revenue was also important.³² In fact, the privatisation conflict wasn't about an all-or-nothing result, but to what degree private entrepreneurship should be allowed in state business. There was ministerial consensus that some private input would be a good thing for the power industry: "Structural changes within national power production will, with time, make an evaluation of Statkraft's need for industrial partners essential." The government was "open-minded about industrial configurations in which Statkraft takes part, with the state no longer being the sole owner."³³

In 2004, there was a political majority in favour of Statkraft becoming a limited company. By 1 October, the corporation Statkraft AS (aksjeselskap) was up and running. How was the question of part-privatisation dealt with? That change had majority support, too. In this matter, the government, together with the Fremskrittsparti, which was the largest among the center-right opposition parties, could count on a Storting majority. The Fremskrittsparti put forward a policy which backed Statkraft being quoted on the stock market after a devolvement of 70% of the state's holding.³⁴

But the Bondevik government never got as far as proposing part-privatisation. After the 2005 election, a new coalition took over, consisting of the Arbeiderparti, the Sosialistisk Venstreparti and the Senterparti. Jens Stoltenberg, the leader of the Arbeiderparti, was the Prime Minister once more. The new government commanded a Storting majority – for the first time in many years – and its approach to state ownership in general, and the status of Statkraft in particular, was predictably different from that of the Bondevik ministers. In 2005, the three parties clarified their joint position to the Storting in a comprehensive document entitled *An Active and Long-term Ownership*. It stated the official view on most aspects of ownership policy and, with regard to Statkraft, put a stop to the talk about part privatisation. The government wanted to own the company wholly, again with reference to the need to keep its skills, as well as its head office in Norway. However, its most important consideration was to



In 2001, Bård Mikkelsen took over as CEO of Statkraft. Under Mikkelsen, the company profile as an environmentally aware organisation has been enhanced. The picture was taken in the autumn of 2001 at the opening of Norway's first wind turbine farm in the western community of Smala

ensure that the gains from hydropower exploitation should benefit "society at large", rather than private interests.³⁶

This policy is still in place at the time of writing (2009). It might however change completely at any time. As recently as in the autumn of 2008, the debate about state ownership flared up again after declarations by both Høyre and the Fremskrittsparti, stating that they felt the state should rid itself of several of its claims to business ownership. Statkraft was one of the companies mentioned by name in this context. The Fremskrittsparti wanted to reduce the state's holding in Statkraft to 51%, while the opinions of Høyre were less succinctly put. The whole matter will doubtlessly remain an important political battleground in years to come.

UNCERTAIN LEADERSHIP?

Having followed events so far, it is surely safe to conclude that, ever since the market reform, operating conditions have been changing rapidly for Statkraft. The company is still controlled by an owner whose immediate intentions, as well long-term goals have varied considerably from time to time. In what ways has this affected the company's development and its capacity to trade in a steadily more commercialised and globalised marketplace? How has its management interpreted the situation and reacted to it?

There is an enormous literature in the area of "corporate governance", almost all of which tends to emphasise that active ownership is perhaps the most important component of contemporary enterprise. Owners should add certain skills, mainly in collaboration with the company board, and also provide clear guidelines and a steadying hand for the management. In privately owned businesses, this form of leadership is seen as straightforward, both in principle and in practice. When the owner is the state, the matter becomes more complicated. When the state keeps a firm hand on the tiller, it tends to be seen as political interference, rightly or wrongly. Also, the addition of political motives is regarded as an unfortunate complication in the case of a company trading in liberalised markets, even though its mandate is to operate as a normal business. This might occasionally make the state behave as a *passive* owner, but is a risk that probably applies more to companies involved with politically sensitive products or processes. In such circumstances, keeping commerce at an arms-length distance can seem the politically most comfortable option.

There are reasons for assuming that for most of the 90s, such considerations contributed a great deal to the state behaving as a passive owner of Statkraft. Lars Thue has stressed that, after 1992, the company went from being "over-directed" to "under-directed", i.e., that the state distanced itself too much from company business and growth. Thue suggests three outstanding reasons for this. First, the politicians saw it

as important to give Statkraft more freedom. Second, as ministers came and went, no one wanted to be held responsible for the political fallout of specific decisions. Third, no political consensus existed about the best role for the state-owned producer in the liberalised power market.³⁸

The two latter points are especially likely to be taken as proof that the state is not suited to be an owner of commercial companies. But the situation as a whole might also be seen as typical of a process of reorientation and restructuring. In a period characterised by radical shifts within the sector, ministers and their civil servants probably took the wisest course by avoiding impositions on the company. Besides, during the first few years, the most serious challenges to Statkraft were internal and structural, i.e., primarily concerned with turning itself from a civil service department into a business organisation. The company management was likely to be best placed to deal with this transformation, which meant leaving directive strategies from any quarter until after the upheaval had settled down.

During the past decade, the state has again chosen to keep away from active interventions and only very rarely acted as a politically motivated owner. The composition of the board is one aspect which proves this point, since the membership is mainly selected on the basis of skills rather than on political affiliation. This principle applied already at the time of the 1992 restructuring and it has become more firmly established since then. For example, throughout this period, practically all the chairmen have had a wide range of experience in private enterprise. This is true of many of the other senior board members, too. Dismantling the special obligation to supply industrial power and then restructuring into a limited company have brought greater stability, which has been further assisted by clearer definitions of both the company's responsibilities and the owner's intentions. Thus, there is no longer any doubt about the dominant commercial aims of the company. Over the last few years, owner, board and management have for example agreed that the company's overriding business strategy should be "to become a European leader in environment-friendly energy." 39

Becoming a limited company has brought with it a greater financial independence, even though the designation as "fully state-owned" does not allow the company to expand its operating capital through share emissions and similar devices. In this respect, Statkraft's freedom of action during its period as a "state enterprise" was much more limited, because, for one thing, debt or guaranteed obligation values were capped. Any capital requirements above these limits had to be met by the owner. Of course it has been helpful that the state was, and still is, very wealthy and also relatively generous. Between 1996 and 2002, the state allowed close to 17 billion NOK in new liquidity. Also, during the same period, the cap on debts was raised from the initial 25 to 42.5 billion NOK. These capital injections enabled Statkraft, among other things, to buy up Norwegian electricity companies (cf. Chapter 11). But in 2004, even though the



Pålsbu power plant in Buskerud county is one of the few hydro power station built in Norway by Statkraft over the last decade.

state insisted that it would not provide more money, the directors greeted the limited company status as a very important change. 40

These recent changes and clarifications seem to have made Statkraft's current leadership feel reasonably comfortable with the state as owner, although an industrial partner holding a minority ownership would be regarded as a positive development. However, there is definite opposition between the owner and the company board on a very important issue: dividends. From around 2000 onwards, the state has gained a great deal 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%. In other words, precious little of company profits have remained in-house. What the state gave in the form of working capital, it has largely recouped through its policy on dividends.

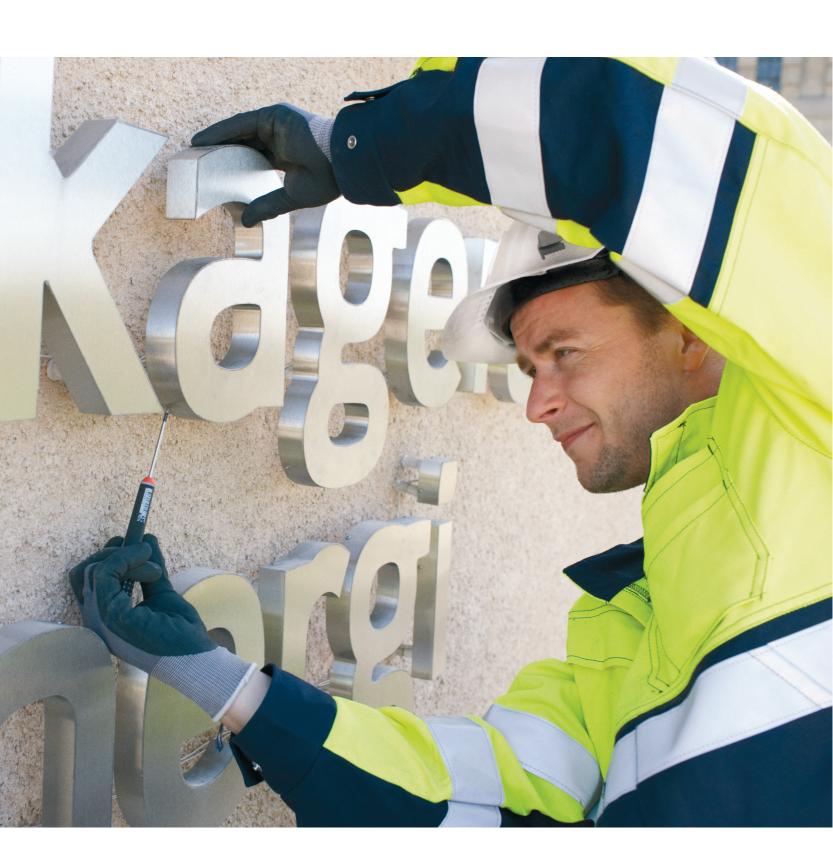
This policy has naturally caused intense frustration in the company. In 1999, when the state had pocketed 600 million NOK, which corresponded to 60% of profits after tax, CEO Lars Uno Thulin commented: "It is not very farsighted to extract such a very high share of profits in dividends from a company expected to play a decisive role during the on-going restructuring of the power production sector." There was some

hope that the practice would change under the Arbeiderparti government under Jens Stoltenberg, which in 2000 agreed to limit its dividend demands for some years to 50%. However, the promise has not been kept, either by the Bondevik II government, nor by Jens Stoltenberg's latest three-party coalition. During the last few years, the state's share has been even higher, further heightening the frustration felt by members of the Statkraft board and management. A

It is worth noting that this handling of Statkraft's profits would appear to be in complete contradiction to the general guidance on dividend policy which the state has adopted in the last decade. For instance, the Arbeiderparti government under Torbjørn Jagland (1996–97) stated in a 1997 report to the Storting that state ownership should be evaluated in terms of the individual company's problems and needs. The Jagland document concluded that companies with "good access to profitable investment projects and whose growth prospects were promising" should be "subject only to moderate dividend demands". On the other hand, companies with "no major investment projects" could be said to be "at the harvesting stage" and ought to be asked for larger proportions of profits to be paid out. 44 Currently, Statkraft belongs to the first category, perhaps more so than even in 1997, but the state's dividend demands have not become more modest.

WHY IS STATKRAFT STATE-OWNED?

The income from dividends might be the main political reason for the fact that Statkraft remains state-owned. The company is a revenue-generating machine, which is likely to carry on working for many years to come. It is also the state's most efficient means of collecting the gains from hydropower developments. The parties on the left in particular have emphasised that this is a major issue, as has been described earlier. To a greater extent than their right-wing colleagues, politicians of the left believe that hydropower is and should be a shared national resource. Through state ownership of Statkraft, a substantial tranche of the yields can be ploughed back into the community. We have in fact come across conflicting goals or at least a set of contradictory motives: socially useful taxation as against business-oriented expansion strategies. How the conflict will end remains an open question.



Chapter 11

A strategy of expansion: at home

"It is a government priority to support existing large Norwegian-owned firms and promote the growth of new such enterprises. Even though most of our native businesses are small, it matters to them, too, that there is a reasonable number of larger and internationally oriented corporations which have the fundamental aspects of their work, such as their headquarters and R&D activities, located in this country."

his is one of the conclusions taken from the document entitled *On Owner-ship of Enterprise*, presented to the Storting in 1997 by the Arbeiderparti government led by Torbjørn Jagland. The document contained the official response to a new social challenge: the fast-growing economic integration between countries and larger regions that has become known as "globalisation". In the globalised economy, business size has become a more important factor than it used to be, mainly because of the need to compete on a world market and also to have large native counterparts to expansionist foreign firms. In this context, the Norwegian government regarded it as crucial to confront the global economy and encourage the expansion of large corporations with close ownership ties to Norway.

Since the mid-90s, Statkraft's strategy for growth has fitted perfectly with the Jagland government's vision. During the last fifteen years, the company has been investing systematically in expansion, in the first hand through buying up other enterprises and shareholdings. This policy served to consolidate Statkraft's position in Norway still further. Abroad, it has invested mainly in Sweden, where Statkraft has by now (2009) become the fourth largest power producer. During the last few years, the company has also acquired ownership stakes in various European generating companies, initially in Germany and Great Britain. It has also been investing in the power industry outside Europe, in Asia in particular, but also in Latin America. Currently, Statkraft is involved in hydro- and wind power projects in countries as far apart as Chile, Peru, Laos, Nepal, India, the Philippines and Sri Lanka. It has also set up trading offices in a whole string of countries, in Europe and elsewhere. Hence, in less than a decade, Statkraft has expanded from being a large Norwegian enterprise into a quite significant player on the global stage. The company has actively aimed for the options opening up since the early 1990s in a more financially liberal and internationally-minded marketplace, with regard to power production as well as to the economy as a whole. In the main, this development has had the full support of the company's owner, the state, but it has nonetheless brought challenges of its own.

Within Norway, the resistance has come above all from the Competition Board (Konkurransemyndighetene), which objects to the threat that it feels the dominant state enterprise poses to free competition in the power market. This is a case of Statkraft getting caught between the national laws on competition and an increasingly internationalised power market. Statkraft is strong in Norway, but not dominant in the Nordic trading area. Other troublesome issues have arisen in the context of other companies, with whom the Norwegian state does not wish to be associated. Statkraft's ownership holding in Sydkraft, a major nuclear power producer in Sweden, was a case in point. It has now been sold. Statkraft of course also shares with other First World businesses all the specific difficulties that engagement in Third World settings entails. Trading on a global scale comes with a whole catalogue of familiar problem

PREVIOUS PAGE: In the mid-90s, Statkraft began a series of acquisitions of Norwegian electricity companies. One of the largest purchases was Skagerak Energi, which focused Statkraft's Norwegian business activity on the eastern region of the country.



areas, which often pose challenges to state enterprises in particular. One example is Statkraft's Indian daughter company and the criticism it has attracted for its poor health and safety record.

A lovely view of the inlet to one of the power stations belonging to the BKK company, one of the local authority-owned electricity companies on the Bergen peninsula. As of today, Statkraft owns 49.9% of the BKK, which is one of the largest generators in Vestlandet County.

TRADING IN POWER COMPANIES

Before the power market reform in Norway, the country's electricity generation and distribution industry was characterised by exceptionally stable ownership structures. Buying and selling whole firms was rare, and would then mostly involve a local electricity company merging with a larger, regional one in the same area. The market reform caused a profound change. True, it didn't entail a programme of targeted privatisation, as was the case in Great Britain and elsewhere. But in Norway, too, one expected that the consequence of liberalisation would be the growth of a commercial property market dealing in power stations, distribution networks and electricity companies. It was also widely believed that local authority businesses, unable to survive the complications of the market environment, would gradually be forced to merge into larger and stronger units.

There was in fact quite a long interim period before the electricity companies became subject to trading on a major scale. Many public sector owners felt uncertain

about the rights and wrongs of selling. Also, the fragmented ownership structure of the electricity industry meant that there were too few potential buyers with the size and resources to bid on a large enough scale. Some of the regional electricity companies were perfectly capable of purchasing smaller, local units, but only Statkraft had the organisational and financial clout to acquire, for instance, a sizeable power generator. Competition to Statktaft had to come from foreign firms.

In fact, it was first in the second half of the 90s that a real marketplace came into existence and allowed dealing in power companies and their shareholdings. Statkraft's first wave of acquisitions gave the trading a vital impetus. However, large foreign firms also took an interest in Norwegian power production, which further heightened the sense of dynamism. The Swedish state-owned power producer Vattenfall, the biggest in Scandinavia, seemed particularly keen to invest in Norway. This had at least two important consequences: firstly, competition for the targeted companies increased. Secondly, Statkraft was forced onto the offensive. Statkraft's policy goal had been to lead any restructuring of the Norwegian power sector and hence it resented competition from abroad. It was important to the company to be at least one step ahead of operators like Vattenfall, and a few instances of tough rivalry between the two state-owned companies drove the purchase prices upwards.² For owners of power companies, the lookout was good, with growing likelihood of good and steadily improving prices. In some cases, owners suddenly felt ready to sell.

BUYING IN THE EAST AND WEST, NORTH AND SOUTH

Arguably, the expansion of Statkraft started in 1993, when the company bought Finnmark Energiverk AS, owned by the Finnmark county authority. True, the purchase was not part of a goal-directed growth strategy, but rather pushed by the local authority in Finnmark, which was very eager to sell. The market reform had, for various reasons, landed Finnmark Energiverk in deep financial water.³ Statkraft adopted a more goaloriented and aggressive purchasing strategy first after 1995. In 1996, buying began in earnest with the acquisition of a sizable holding in the second largest power producer in the country, the Oslo Council-owned Oslo Energi Produksjon (later, E-CO waterpower). A series of new part acquisitions followed. In 1999, Statkraft bought a major share of one of the largest companies in the western region (Bergenshalvøens Kommunale Kraftselskap AS in Vestlandet) and, in 2000, it became part-owner of three companies in the east of the country (the Østlandet firms Vestfold Kraft DA, Skiensfjorden Kommunale Kraftselskap AS and Hedmark Energi AS). The buying spree peaked in 2002, when Statkraft increased most of its existing holdings and at the same time bought up additional full or part-ownership stakes in companies located in the south of the country as well as further north, in the Midt-Norge region (including Trondheim Energiverk).

All this activity cost the company serious sums of money. Over the period 1996 –2002, the inland purchases topped 26.5 billion NOK, with almost half that sum spent in 2002 alone. On the plus side, large plant and financial resources had been added to the company's already extensive production capacity. From an annual power output of about 32 TWh, a figure corresponding to a third of Norway's total, the production rose to nearly 42 TWh in 2003. This increase was almost entirely due to acquisitions of existing power stations. Add to that Statkraft's shares in part-owned generating companies and its overall capacity reached around 55 TWh, or almost 47 % of the total Norwegian power production.

Statkraft's active acquisitions policy consolidated and further strengthened its

dominance as Norway's prime supplier of power. In 2003, no native or foreign operators could begin to threaten its position. The Norwegian companies were, as we know, comparatively small. Also, regional and local businesses seemed on the whole unwilling to grew bigger through mergers or other, less tight collaborative relationships. Despite all this activity, Statkraft's hegemony didn't trigger any targeted counter-reaction from electricity sector insiders wanting to put a brake on the expansion of state-owned giant.

A THREAT TO FAIR COMPETITION?

Even though the growth of Statkraft didn't cause any significant reaction within the power sector, other agencies watched its expansion with increasing dismay. The competition authorities were taking a particular interest, which grew stronger still after the 2002 purchases. The general opinion was that Statkraft over the last few years had become a threat to free competition in the power market. The Competition Board was particularly concerned about the company's position in certain regions. Post-2002, Statkraft controlled a good 42 % of production in the south (Sør-Norge) and over 50 % in Midt-Norge.4 The Board felt that this could potentially overwhelm local businesses and therefore lead to "a substantive reduction in competition." 5 Indeed, the Board found the situation so grave that it initiated actions: by the end of 2002, Statkraft was ordered to sell the recently bought Trondheim Energiverk in Midt-Norge, as well as the newly-acquired stake in the local company Agder Energi in the south. In the

Through its purchases of the regional electricity companies Skagerak Energi and Agder Energi, Statkraft is now the majority shareholder in the Sira-Kvina power company, the owner of the large generating complex at Sira-Kvina.







latter case, Statkraft was given an alternative, which entailed selling shares in two other local power companies and, in addition, production capacity equivalent to 1 TWh.

Of course, if that one company owns a large share of production capacity, be it 42% or 50%, need not necessarily be a bad omen for future competition and power balance in the marketplace. Another point, just as valid: when trading has a Nordic dimension, it might well be meaningless to stress one company's stake in some regions or counties. Although Statkraft was one of the largest producers, its share of the total Nordic output was relatively minor.

When the Competition Board became so agitated about regional dominance, its reaction must be seen in the context of understanding that *in practice* the marketplace for power often failed to operate either as a joint Nordic, or a truly national market. The cause was the occurrence of so-called *transmission bottlenecks*. The central grid, i.e., the part of the transmission system which linked regions and counties into a coherent network, was sometimes unable to carry the amount of power that the market, i.e., the demand-led supply, required. The effect was to create functional blockages, which meant that Statnett, the system operator, had to isolate regions without sufficient carrying capacity and allow them to run internal markets with their own price levels. The Competition Board felt that, in such situations, Statkraft should exert its dominance.⁶

Transmission bottlenecks caused truly significant problems. Since the late 1990s, Statnett quite frequently had to zone the Norwegian market into separate pricing areas. The constrictions occurred most often between the central Midt-Norge and the southern Sør-Norge regions. In some years, the subdividing exercise had been extensive, as for instance in 2000, when Sør-Norge set its own tariffs for 55% of the year. True, 2000 was an extreme case. However, between 1998 and 2001, the three main regions of Sør-Norge, Midt-Norge and Nord-Norge functioned as isolated pricing areas for 20–30% of the time on average, even though some years had much lower figures. But, was the Competition Board right to assume that Statkraft was capable of affecting the pricing outcomes in such situations? And, even if it could, was it then reasonable to demand that Statkraft should shoulder the burden, when it was the grid that couldn't cope at all times? Should grid failure really be used to drive radical changes, such as the company having to sell off its shareholdings?

No exact answers to these large and complex questions have ever emerged. Incontestably, grid bottlenecks *might*, in some circumstances, enable a generator of Statkraft's size to exert influence on prices. However, the Competition Board was unable to prove that it had actually happened. When contemporary cases of undercapacity in Norwegian and Nordic markets were examined for bottleneck effects and market manipulation, the authority again failed to find much support from the empirical data, nor did later studies come up with any proof. While such investigations

PREVIOUS PAGE: A 1994 view of a transmission line, under construction at the Svartisen power station in Nordland.

neither proved nor disproved the possibility, the lack of solid evidence was a fact, which the competition authority couldn't ignore completely. And, naturally, it was a fact that Statkraft was keen to stress.

The question concerning the rights and wrongs of Statkraft being made responsible for malfunctions of the national grid also doesn't have an obvious answer. On one hand, economic criteria indicated that to scale up the entire grid to prevent all possible bottlenecks wasn't rational, since it would mean excess capacity for most of the year. On the other hand, there was no easy way of establishing how great the carrying constraints had to be before economic criteria would instead favour more transmission capacity.

Statkraft insiders argued that the whole systemic problem was due to Statnett under-investing. CEO Bård Mikkelsen put it like this in 2003: "We feel that Statkraft and its partners in the Nordic electricity market should expect transmission bottlenecks to be only temporary – if, that is, Statnett and its Nordic sister organisations perform properly." Mikkelsen felt that the dimensions of the national grid must not "determine structural development in the long term." Or, put in a different way: mergers and buy-outs must not be hindered by the insufficient grid capacity that Statkraft encountered from time to time. Though there was a lot to be said for this argument, it was also obvious that *in Norway* the bottleneck problems raised issues of competition primarily related to the role of Statkraft, due to its unique size and dominance. Of course, the matching question concerned the extent to which Statkraft's status and expansion policy should dictate the dimensions of the national grid. That question can only be answered in the context of the potential social gains from allowing Statkraft to grow bigger. This, as we shall see, was as much a political as a purely economic matter.

BALANCING COMPETITION AND NATIONAL OWNERSHIP CONCERNS

As the arguments continued, it became clear that what divided the Competition Board and Statkraft was not only a matter of competition laws and the economy, but also of politics. In principle, the Board was a politically independent authority, set up to administer the laws on competition on the basis of the professional judgements of its staff. If an operator disagreed with the Board, it had the option to take the matter further and appeal to the relevant ministry. But, of course, a department of state is not just managed by its civil servants, but also by its political masters and so, at times, has to serve the political ends of the current government. In the Statkraft case, this would become very obvious.

By the end of 2002, Statkraft turned to the ministry with a complaint concerning the decisions of the Competition Board.¹¹ At the time, Kjell Magne Bondevik's



In 2003, Oslo City Council intended to sell parts of its investment in the electricity sector and started negotiations with a potential foreign buyer. But in Norway this approach immediately raises protests, because the public take national state ownership more seriously than in most other countries.

second right-of-centre coalition government (2001–2005) was in charge and the Competition Board belonged under the Ministry of Work and Administration. The minister was Victor Norman, who represented the Høyre party. Victor Norman was professor of economics at Norges Handelshøyskole (Norwegian School of Economics and Business Administration).

The Ministry of Work and Administration gave Statkraft only very limited support and agreed that the company had had very real opportunities to exert price control over local markets in cases of transmission bottlenecks. ¹² In other words, the ministry stood by the Competition Board, but toned down some aspects of the board's strictures. ¹³ Most importantly, Statkraft was allowed to keep its newly acquired share holding in Agder Energi, although only on condition that either certain other generating stations or else part-ownerships in the south were sold off. The order to sell Trondheim Energi still stood, although the Board's original deadline was modified so that Statkraft had a little more time to complete the sale.

In the Storting, several opposition parties reacted sharply to the edict from the Ministry of Work and Administration. The Arbeiderparti was especially critical, arguing that it was important for national reasons that Statkraft should be allowed to buy any Norwegian companies that were up for sale. According to the Arbeiderparti, these companies would otherwise end up in foreign hands. We have noted above that few, if any, inland business organisations other than Statkraft had the resources to finance investments in full or part-ownership share issues. The Arbeiderparti was very doubtful about the value of foreign investors and made a case for the power sector being wholly in Norwegian control.

Just as this case was being debated, another putative sale did its bit to reinforce the need for a strong Statkraft, at least among those who favoured national ownership. The local authority in Oslo announced plans to sell its majority holding in the power company Hafslund, which was one of the largest producers and owners of distribution networks in the eastern Østlandet region. It had become known that the massive Finnish energy supplier Fortum was among the interested customers. The politicians, particularly on the left, reacted with dismay. Many were very alarmed about the possibility that a foreign owner might be in control of a company as large as Hafslund. There were those who saw in this deal an early warning of what Norway could expect in the future. Fortum was likely to be just the first in a series

of large, foreign businesses systematically moving into the Norwegian electricity supply sector. Statkraft was the one and only organisation that could act as a realistic defender against a commercial invasion. Hence, its options for expansion should not be blocked by rules on competition.

In the Storting, the majority consistently wanted a national heavyweight to dominate in the electricity sector. However, opinions were divided about how to go about achieving this end. Høyre and the Kristelig Folkeparti, the two largest parties represented in the Bondevik government, felt that, in this case, there was no need for concern: national ownership was too well entrenched for any threats to be effective. They also stressed that overall control of hydropower resources were adequately protected by legislation. Even if Fortum were to buy part of Hafslund, it wouldn't cause any major problems. Consequently, these parties were not much exercised about Statkraft's role as protector of continued national ownership.

But, as we know, the opposition parties saw things quite differently. In the Fortum case, the Arbeiderparti, Sosialistisk Venstreparti and Senterparti all argued that the state should step in and buy Oslo Council's shareholding in Hafslund. They also insisted that Statkraft could and should be actively used to promote national ownership. One way of doing this was to grant the company more capital to buy shares, another to change the laws on competition in order to permit the state-owned company to buy up other firms. It was envisaged that Statkraft would then be able to ensure "a continued and considerable public ownership stake in Norwegian hydropower whenever local authorities decide to sell off such assets." Besides, leftwing politicians felt that the Competition Board was misguided in its use of purely internal, Norwegian criteria to judge Statkraft's market position. Norway was part of an inter-Nordic market and hence Statkraft ought to be evaluated from a Nordic perspective rather than a regional or national one. In short, Statkraft should "be seen in the context of Swedish and Finnish companies and given more space to expand within Norway."

BARRED FROM FURTHER EXPANSION IN NORWAY

The Bondevik government choose to back the Ministry's decision in the Statkraft case. The company had to get rid of its newly acquired holdings in central and southern Norway. In the latter case, Statkraft sold shares in the hydropower company E-CO and in Hedmark Energiverk, respectively in 2004 and 2005. It was allowed to hold on to Trondheim Energiverk for slightly longer.

Following this impasse, Statkraft could hardly expect to grow by buying up power companies in Norway. True, the wind seemed blow to its advantage after the change of government in the autumn of 2005, when Jens Stoltenberg and his red-green coalition took over from Bondevik. One of the first decisions made by the Stoltenberg cabinet

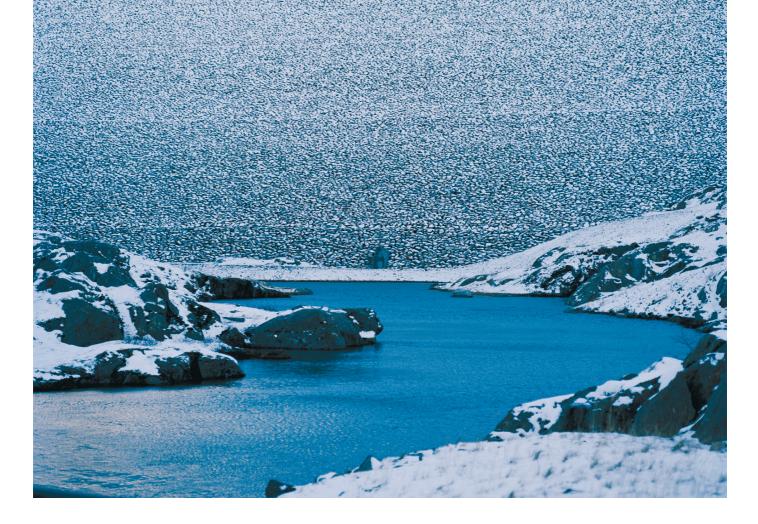
was to overturn the still not executed order stating that Statkraft had to sell Trondheim Energiverk. The Stoltenberg government based its action partly on national concerns and partly on the need to support Statkraft in the face of the increasing international competition in the energy sector. Generally, the government insisted that it was necessary to develop native industries capable of breaking through into international markets. It seemed reasonable that if a company were to be effective internationally, it had to have a strong position in the home market. There was a shared feeling that to make further growth possible, one necessary step was for Statnett to attempt to limit the bottleneck problem.

Be that as it may: despite the red-green parties supporting Statkraft and its growth policy, it was an inescapable fact that any new purchases would lead to new confrontations with the Competition Board. There were, after all, limits to how far the government could go against the judgements of the main competition authority. Besides, there was no appetite within Statkraft for more processes of inquiry. This is why the government's decision in the matter of the Trondheim Energi sale – positive from Stakraft's point of view – was actually the last brick completing the barricade against the company's expansion strategy in Norway. Since 2005, Statkraft have not attempted any larger purchases at home.

RENEWED INVESTMENT IN GENERATING CAPACITY

Growing by buying up other companies, or so-called "non-organic growth", is an effective way to expand, but for Statkraft it was no longer an option. The alternative is to grow "organically", that is, through upgrading or developing new industrial plant and/or moving into new business areas. Statkraft had invested a great deal in both options during the 90s. During the first half of that decade, the construction of generating stations had slowed down to a halt due to large power surpluses and low prices, but after 1995 Statkraft started once more to go in for new building projects. The rising prices that accompanied a tightening power balance served as a stimulus. In the first place, the company revived old hydropower plans with existing concessions, which had been shelved when the plan seemed unprofitable. Secondly, although so far unfamiliar with using gas and wind as energy sources, these technologies opened up new business options.

The renewed interest in power plant construction was very much in line with the energy politics of the day. The second half of the 90s was characterised by increasing anxiety about the nation's power balance, both inside the sector and among the politicians. The concern was focused on the capacity of the system to generate sufficient power in dry years. Although consumption had increased at a steady pace since the 80s, the same period had seen very few new sources of supply coming on stream. The



effect was to diminish power supply margins. The tide turned in 1996. In response to the low precipitation figures for that year, the spot market prices shot up sharply – more dramatically than ever seen since the power market was established. Worse, Norway actually had to import large amounts from its neighbours in order to meet internal demand, with the outcome that, for the first time for many years, the country became a net importer of power.¹⁹

The high prices, as well as the dependence on imports, created worries in many quarters, as well as demands that something should be done. The summary of Statkraft's annual report for 1996 concluded: "The growth in consumption calls for action." In 1997, the Arbeiderparti government under Torbjørn Jagland (1996–1997) set up its own committee, the so-called Energy Committee, and charged it with reporting on the probable energy and power situation in the future. The decision to set up the Energy Committee was directly related to the problems of the previous year. By 1998 the committee had completed a very wide-ranging report, which argued that Norway would become increasingly dependent on imports unless production grew, or consumption stagnated. Kjell Magne Bondevik took over from Jagland in the autumn of 1997 and formed his first coalition government (1997–2000). It acted on the Energy Committee's report and, in 1998, presented an extensive document on energy needs to the Storting. The Bondevik government also indicated that it would,

Splendid winter picture of a dam. The Storglom Watercourse Dam.

with immediate effect, put in place measures to ensure that supply matched demand in the future. ²³ The document went on to warn that, in the first place, there would be increased emphasis on economising and reducing electricity consumption. A transition to forms of energy that could replace electricity would be encouraged. Secondly, it was stressed that power generation must be stepped up but especially by using renewable sources of energy. ²⁴

THE ERA OF HYDROPOWER DRAWS TO A CLOSE

Flowing water as an energy source was singled out as deserving investment, not only by the Energy Committee, but also by both the Jagland and the Bondevik governments. As we noted earlier (Chapter 6), hydropower plants had gained a bad reputation in the 70s. The approval ratings rose again during the next decade, but the bar was still set quite high for new projects. Then, by the second half of the 90s, the political will to invest in new hydropower stations seemed to be on the increase. For one thing, the Energy Committee expressed the view that the planning process ought to be simplified. It recommended that the old *Overall Plan for Watercourses* (cf. Chapter 6) should be revised, since it was a "barrier against investments in new hydropower developments." The Bondevik government's 1998 document stated that there were "many excellent opportunities to expand hydropower generating capacity through new projects, as well as through adding to existing plant." Energy Committee to expand hydropower generating capacity through new projects, as well as through adding to existing plant."

Statkraft saw all this as positive. It was holding on to a raft of quite large projects, which had passed through the planning system back in the late 80s, but been kept on the back burner during the power surplus years. Top of the list were the stations planned for Beiarn, Bjøllånes and Melfjord in the north. By 1997, estimates suggested that they would run with a profit at current building costs and power prices. The company also evaluated a station on the River Sauda in Rogaland County in the west of Norway, as well as a few smaller projects. At the end of the 90s, Statkraft had a portfolio of financially promising hydropower projects, forecast to have a combined annual yield of 4–5 TWh. Statkraft went after these projects with determination. The first was the already approved Beiarn plant. In the summer of 2000, Jens Stoltenberg's Arbeiderparti government (2000–2001) renewed the planning permission and the construction phase began. Two more applications were almost ready to be submitted.

However, construction at Beiarn plant proved that hydropower ventures could still be controversial and that, when conflicts arose, political support didn't take long to crumble. Almost at once, local people protested and, among other objections, argued that the environmental impact assessment for the plant was full of omissions. Their protests didn't take long to reach the Storting. Stoltenberg and his ministers made it clear that they didn't care to step into the breach and ordered Statkraft to

put construction on hold until further notice. Next, in a broadcast New Year speech the same year, the Prime Minister declared that both Beiarn and other large power plants would not be built at present. The confrontation with the public over the Beiarn project was without doubt one reason for this. Just shortly afterwards, Olav Akselsen, the Minister for Oil and Energy, ordered Statkraft to stop all work on Beiarn, as well as on the company's other large plans. In practice, the effect was to remove a crucial platform for the company's business plans. The government's decision was hugely disappointing for Statkraft. What energy sources should it invest in now?

POWER FROM GAS - FROM BEING A PET OF THE GREENS TO AN UNLOVED MONGREL

By the mid–80s, the capacity to use gas for power generation had arrived practically out of the blue, but soon came to be regarded as a realistic alternative to hydropower (cf. Chapter 7). Statkraft started to work up a plan for a gas-fired thermal station in the west, using gas piped in from Norway's continental shelf. Like other power plant options, the idea was shelved in the surplus years around 1990, only to look fresh and interesting again in the second half of the 90s. Once again, Statkraft was among the first and the most committed of the firms that undertook the construction. Statoil, the fully state-owned oil company and Norsk Hydro, the partly state-owned industrial concern both joined Statkraft to form a company called Naturkraft AS. Its objective was to build and manage gas-fired power generation in Norway. In 1997, Naturkraft was awarded concessions for two stations, in Kårstø in Rogaland and Kollsnes in Hordaland County.

Even though hydropower seemed to be the answer during the 90s, many felt that it was gas that could truly solve Norway's supply problems. Kårstø and Kollsnes alone were set to produce 5.5 TWh annually, which corresponded to around 5% of the nation's total power production during a normal year. There were sufficient gas reserves out there under the North Sea to feed many more power stations. Environmentally, it also seemed a good option: compared to coal, which dominated power production in many European countries, CO₂ emissions from gas-fired stations were tiny.

The scheme for power from gas – and Naturkraft itself – started off enjoying political support almost across the board. The Arbeiderparti expressed especially positive views about the use of gas. In 1994, Jens Stoltenberg, who at the time was Minister for Enterprise and Energy in the second Arbeiderparti government under Gro Harlem Brundtland (1993–1996), announced that Naturkraft's plans for gas-fired stations were "environmentally interesting projects, not least because they will help our neighbours to replace coal and oil-fired stations and so reduce polluting emissions." Importantly, power from gas opened up new possibilities for using Norway's hydrocarbon wealth. A later, powerful incentive was the previously described concern about a deteriorating

power balance. The future implications of this problem had been widely understood, which was another reason why a Storting majority gave the thumbs up for Naturkraft's two gas station applications.³⁰

But it soon became obvious that power from gas, just like hydropower, stirred up undercurrents of controversy. Between 1994-96, while Naturkraft was working on the plans for the two gas-fired stations, the climate change concept broke through into mainstream politics and, among other issues, triggered serious debate about the introduction of charges for CO₂ release. The Storting's so-called "Green Commission" on taxation recommended in 1996 that power production, oil refining and industry in general should have to pay for their green house gas emissions.³¹ True, when Naturkraft received its concessions the same year, it was exempt from charges, but that was not the end of the matter. One of the large environmental charities submitted a formal complaint about the exemption to National Pollution Authority (Statens forurensningstilsyn). Later, in the summer of 1997, the Jagland government put a stop to construction until the investigation of the complaint had been completed. By the autumn, Kjell Magne Bondevik's first coalition government (1997-2000) took over and the prospects for the Naturkraft stations looked even dimmer. The Bondevik government had a stronger environmental bias that its predecessor and was generally dubious about power from gas. Naturkraft's position became more risky still in 1999, when one of its three owners, Norsk Hydro, withdrew from the joint working arrangement and launched its own plans for building a gas-fired station, complete with CO₂ capture. And then, as if all this wasn't enough, the national Pollution Authority presented the firm with an emissions permit, which turned out to include cleansing standards so strict that, at least according to Naturkraft, the demands could not be met using existing technology.

In 2000, Naturkraft had a cheering piece of news when the Storting majority voted in favour of adjusting the standards set out in the legislation to allow the gas-fired stations to go ahead. The decision was contrary to government policy and the situation soon became so tense that Prime Minister Bondevik turned it into an issue of confidence in the cabinet. In the end, the government fell, Jens Stoltenberg's Arbeiderparti took over and hope surged in Naturkraft. Later that year, after being granted an emissions permit with less strict criteria, the company agreed to restart its construction programme. Even so, building began in 2005. By then, the political temperature had risen again. One threat was that the concession would be withdrawn and handed to another interested party. ³² One such was the state's oil company – Statoil let it be known that it hoped to build a gas-fired station at one of its pipeline landing sites in the west. The gas-fired station in Kårstø finally came on stream in 2007.

Naturkraft has one major reason for hanging back until 2005: the company remained doubtful about the profitability of the gas-fired generating stations. The

relative prices for power and for gas were of course important factors when it came to calculating profits. Because the gas from the North Sea sites is piped to Europe, gas prices are subject to international market swings. Naturkraft had to accept the market prices to maintain power production and hence conditions of the European marketplace were critical for profitability. For a long time, the relationship between gas and power prices led to poor and very uncertain gains. The importance of the gas prices for the profitability of Kårstø remained after the station had started up. The station's single most important criterion for working effectively is that it must be more profitable to use gas to generate electricity, than to sell in it in its unrefined state on the European market. The rather odd outcome has been that the station has been at a stand-still for most of the time since its completion date in 2007, because European gas prices have been high, compared to rather modest electricity prices in the Norwegian power market. This is why the gas-fired station has had little effect on the power market. The future relationship between gas and power prices is going to be of great interest. In principle, it might well be that the gas-fired station at Kårstø won't become operational, even when the power supply in Norway is tight, because of a marked simultaneous increase in European gas prices. In other words, this is an interesting case of the power market making it more difficult to use Norway's own energy resources for domestic purposes.

The gas-fired power station Kårstø in Vestlandet is the first of its kind in Norway. It came on stream during the autumn of 2007.

WIND POWER IN THE WIND

It is probably true to say that Norway is the European country with the best natural potential for using the wind as a source of energy. The relevant technology was developed primarily in the 70s, but it took until late 90s before the idea hit home. Statkraft has been a pioneer in this context, too. So far, it is the only company to have erected wind turbines in Norway.

Both wind and flowing water can be used to generate clean, renewable energy. In the case of wind, the interference with natural conditions is almost totally reversible and the disadvantages are mainly related to aesthetic objections of wind turbines. Consequently, for the last ten to fifteen years, the politicians have been enthusiastic about wind power. For instance, the right-of-centre Bondevik government (1997–2000) declared in 1998 that 3 TWh would be generated from wind by 2010.³³ This target was widely supported in





the Storting and has been restated since. In recent years, there has also been more interest in building offshore wind farms.

OPPOSITE PAGE: Wind power

Statkraft began to investigate wind power options back in the early 90s. In around 1995 it worked on constructing wind turbines, and by 2000 it applied for permission to build wind farms at Smøla, Stadt and Hitra in the west. All three permits were issued the same year. The Smøla project consisted of 72 turbines with a combined output of 150 MW, while Hitra entailed 28 turbines and an output of 56 MW and Stadtland 35 turbines, generating 70 MW.

The swift, painless planning process reflects partly the relative lack of wind turbine effects on the natural environment, but also the politicians' keenness on just this energy source. However, one aspect of wind power was a serious drawback: low or no profitability. Given the prices around 2000, power from wind was too costly. Because Statkraft has to operate according to commercial criteria, this was a problem that it couldn't ignore. All projected wind farms were therefore dependent on official grants or other forms of subsidy.

All of this was well understood among the politicians. In a discussion paper from 1998, the Bondevik government (1997–2000) mentioned that work was underway to set up a grant structure for renewable energy projects and that wind power would be a priority area. Later, it was proposed that the core funding should be paid out as investment grants. Developers could apply for a sum to cover up to 25% of their investment in renewable projects. This subsidy had been critical for investors, including Statkraft. However, it has been clear to all concerned that profits from wind power are still poor, even when funding has been granted in full. This has inhibited developments of wind generation. Statkraft is by far the most ambitious wind energy producer, with a 2007 output of nearly 700 GWh. The overall figure for Norway is just over 900 GWh and the capacity hasn't increased much since 2007. This means that the 1998 target figure of an annual production of 3 TWh from renewable sources is still a long way off.

Low profits have in other words contributed to the slowing pace of development in wind generation, despite political backing and growing demands for more generating capacity. Besides, wind turbines have come to be regarded with a certain scepticism, which Statkraft as well as other investors haven't failed to notice. This is how it was expressed in Statcraft's annual report for 2005: "Increasing doubts about the desirability of wind farms, felt both in the local communities and in the civil service, create uncertainty and sometimes lead to long and costly public inquiries before new developments can take place." Public concern about wind farms has been one key factor behind the steady rise of interest in offshore wind farms. As applied in Norwegian waters, the technology is however problematic and must be further researched and developed. So far, neither Statkraft nor other interested investors have found wind power a satisfactory basis for expansion on a grand scale.

ARE WE MOVING TOWARDS A MORE VULNERABLE ENERGY SUPPLY?

It is obvious from this analysis that, since the 90s, Statkraft's opportunities for "organic" growth at home have been quite limited. With a few minor exceptions, the prospect of building more hydropower stations now belongs to history. Power from gas remains politically controversial, at least for as long as there are no commercially valid solutions to the CO₂ release problem. In the case of gas, there is also the marked influence of price developments in the European marketplace. As for strong growth in power supplies on the basis of wind power, it is unlikely in the foreseeable future.

In the next chapter, we will see how the limits to growth at home have made Statkraft stake steadily increasing amounts of money on opportunities abroad. Before leaving the home front, it is however worth taking a closer look at the general significance of the fact that, over the last ten to fifteen years, neither Statkraft nor other power companies have created any sizeable new power stations. What might be the consequences in the years to come, both for electricity supply and for society as whole, that Norway has so little new generating capacity?

We noted above that the power balance was a cause of serious concern in the second half of the 1990s. Consumption continued to grow and the very low rate of investment into power production caused rising fears of future shortages. During the 90s, consumption went up by just under 18 TWh, while production capacity grew by just 3.9 TWh. ³⁵ During the same period, worries about this trend were aggravated by, among other omens, Sweden's increasing determination to expand its nuclear power capacity. In the increasingly integrated Nordic market, the Swedish decision would have direct effects also for Norwegian electricity supplies. Statkraft was one of the agencies that expressed concern about this development. Already in 1997, the company pointed out that that the Nordic power market was faced with serious challenges and that dealing with current problems, including the Swedish plans, was essential for the management of supply and demand over the next decade. ³⁶ Similar worries were also expressed from other quarters. ³⁷

However, since 2000, less attention has been paid to the power balance, even though consumption has kept increasing and production capacity has not expanded significantly. True, during the last decade, one government after the other has spoken of the need to develop new power sources. The Stoltenberg government (2000–2001) declared in 2000 that the power supply "was under increasing pressure" and that it therefore felt that "our energy policies should put more emphasis on the dangers implicit in every dry year." The underlying feeling was that, unless power production grew, a dry year might cause the situation to deteriorate so much that rationing electricity would become the only option. The Bondevik government (2001–2005) carried on in the same vein, more so than ever after the dry year of 2003, when power prices went sky-high. Just as after the dry year in 1996, there was a spate of official inquiries, all of which concluded that too

little generating capacity was being built and that the electricity supply was becoming insecure. ⁴⁰ In 2004, the Bondevik government made a policy statement to the Storting to the effect that power supplies must be "guarded more strongly than before", and that the government intended to "prioritise this task." ⁴¹

Despite all the good intentions, power stations have still not been built to any significant extent, even though consumption is rising steadily. That the fundamental incompatibility of these two trends hasn't yet caused any serious problems is due to the market reform, which has clearly done a great deal to promote more effective utilisation of resources. The flexible trading system has made it possible to cut the essential spare capacity held in the supply chain. The increasingly close contacts between the Nordic and the northernmost European countries since the 90s, together with reinforcements of the transmission lines, have also helped. It has made power importation possible at times of stress on the Norwegian supply and so reduced the immediate need to extend production capacity at home.

However, none of all this makes for a sustainable system, in the sense that market trading can provide a lasting alternative to more generating stations coming on stream. In the first place, there are obviously limits to the efficiency gains that the market can bring. Also, one must ask whether it is safe to let so much of the electricity supply depend on imports. Over the last ten to fifteen years, not only Norway but also most European countries have slowed their rate of investment in new power production. 42 In other words, Norway is not alone in facing an increasingly tight supply situation. Most countries connected by the northern European grid currently experience similar uncertainties and, in many cases, the production machinery will need extensive updating in the course of the next twenty years. As of today, more than 40% of the nuclear and 60% of the coal-fired power stations are more than 25 years old. In most countries in Europe, the process is complicated by environmental concerns, which impose increasingly tight restrictions on new construction projects. Overall, this development has caused the organisation of the national system operators in mainland Europe, the Union for the Coordination of Transmission of Electricity (UCTE) to forecast that any future scenarios will entail tighter power supply margins in continental Europe. 43 If this is the case, the question for Norway is whether it is right or defensible to hope to compensate for lacking construction at home by relying on imports.

IS THE PERCEIVED PROBLEM OUT OF DATE?

The facts point to two related questions, among others: how to account for on one hand the large divide between stated political intentions in the matter of power balance and, on the other, the poor investment in more generating capacity? There are those who insist that if power is traded on a free market, the perceived problems associated with the national



Maintenance at Sima power station in Eidfjord

power balance are irrelevant. According to conventional economic teaching, the theory is that the market will prevent any actual power shortages, even if production capacity is reduced due to low precipitation or for other reasons. In such situations, prices will rise and demand will decline in consequence, until a new balance is reached between supply and demand - between production and consumption. In this way, the marketplace buffers against swings, which could have led to a crisis. The same theory also predicts that if, over a period of time, the market price levels provide higher than normal gains for producers, the automatic outcome will be to stimulate increased investment in new production capacity, which in turn will exert a downward pressure on prices. The regulatory effect of the pricing mechanism was a crucial premise for the whole market reform. Statkraft, for one, backed it in this statement, made during the early phase of the reform: "The problem of generating sufficient power no longer exist; the problem is now one of price."44 The 1999 energy document issued by the Jagland government stressed the similar conclusion that "power prices have a critically important function for ensuring that there is, at all times, a balance between production

and consumption."45 But does the market work as per the theory?

The price mechanism functions more or less as predicted for many types of products and markets. However, for a long time now, the trade in power has shown that theory and practice can occasionally part company. One distinctive feature of this market is the very limited degree to which prices affect demand. This has been glaringly obvious at times of high prices: consumption tends not to decline as prices rise, not even very dramatically as for instance in 2003. Demand stability is primarily due to the fact that electricity is an essential commodity. In other words, electricity is one of the last items that domestic and business users are prepared to skimp on, despite high cost. Hence, suppliers cannot assume that prices will have the expected regulatory effect, even at times of power scarcity.

Also, realistically, the relationship between price fluctuations and company investment levels is not going to be automatic. As we have noted, the decision to construct a new generating station is far from a straightforward matter of estimated future profits. Just as influential are political issues, environmental and climate-related policies in particular, as are public attitudes. New power projects will not be completed just

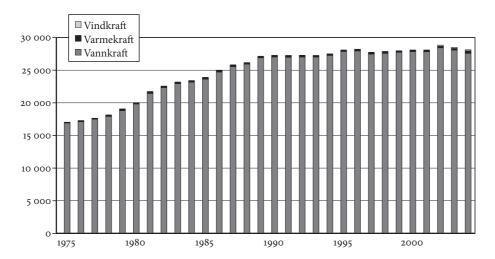


Figure 1
Expansion of power production capacity in
Norway for 1976–2005

because they are believed to be profitable. In other words, it is reasonable to argue that a nation's power balance is in the first instance the responsibility of its politicians.

So, when all is said and done, it is clear that one of the most vital questions concerning energy policy in the next few decades is this: How to combine the need for a robust system of electricity supply at reasonable prices with a sustainable approach to the climate and natural environment? Hidden inside this conundrum is a major conflict of objectives, which has in fact plagued the political approach to energy since the early 90s. As we have observed, different governments have been much preoccupied with the energy balance, and especially so at times of shortages. Environmental and climate change-related issues have at the same time imposed ever more strict constraints on station construction. True, there have been cases where the clash between different interest groups has been moderated and conflicts resolved. Much attention has been focused on transitions to new forms of renewable energy sources. This is for instance how the first Bondevik government put it in its energy policy document from 1998: "The framework for production means that this government has to give its active support to a policy of limiting our national use of energy and reducing our dependence on electricity as a source of heat. The required changes will take time. Energy consumption must be limited until it is much less than indicated by current trends."46 Of course such changes take time to bring about and depend as much on financial incentives as on political will. It is also a fact that the results of this policy have so far been relatively modest, as the rising consumption figures confirm. Without painting too gloomy a picture of the power supply situation in the years to come, it is obvious that the forecast contains new and serious challenges to both the power sector and the authorities.



Chapter 12

A strategy of expansion: abroad

In July 2008, a press release was issued from Statkraft's Lysaker head office in Oslo: it informed the world that Statkraft had done a deal with the huge German corporation E.ON, in which Statkraft had agreed to transfer its share holding in the Swedish power company Sydkraft to E.ON. The shares amounted to 44.6% of company equity and, in return, Statkraft took over control of thirty-nine hydropower stations in Sweden, eleven in Germany and one in Great Britain, as well as two quite large gas-powered generating stations in Germany, five district heating plants in Sweden and a parcel of E.ON shares. The agreement was valued at more than 36 billion NOK, i.e. 4.5 billion EURO. This made it the biggest foreign transaction ever made by a Norwegian company. It also meant that Statkraft now ranked above the French energy giant EdF as Europe's largest producer of renewable energy and also that it became the fourth largest generator in Sweden.¹

he E.ON agreement was the outcome of a targeted, aggressive strategy of international expansion. As early as the 1990s, Statkraft had set itself the objective of becoming "a leading trader in the Nordic power market". By 1996, the company had started to buy up shares in Sydkraft, Sweden's second largest generator. However, acquiring homeland companies remained the priority until 2002, when the Norwegian competition authority blocked all further such purchases (Chapter 11). It was after this decision that Statkraft first decided to prioritise international expansion; the E.ON deal was a particularly obvious expression of this ambition. The company also became engaged in the construction and future management of two large gas-fired stations in Germany. All this, together with the take-over of two E.ON stations, turned Statkraft into a major German producer of energy from gas. Other investments abroad have included wind farms in Sweden and Great Britain, and hydropower developments in southeast Europe. Last, but not least, the company has become widely involved in projects, above all in hydropower, outside Europe and notably in Asia and Latin America. In 2009, Statkraft had set up offices in all of 23 nations and was producing energy in 11 of these, including 7 non-European countries. All of which goes to show that Statkraft by now is a power producer and trader with every right to claim that it has reached global status.

What, fundamentally, gave Statkraft the impetus to pursue its ambitions abroad? Given that the battles for company ownership and market shares were growing ever more fierce and that the company would often have to confront much larger and better capitalised operators, which qualities might give it an edge in international business? These are among the most important questions that I shall attempt to answer in this, the final chapter.

THE INTERNATIONALISATION OF THE POWER BUSINESS

Statkraft's international drive should be seen as part of a trend that is identifiable everywhere in the power business during the last couple of decades. Until the end of the 80s, electricity provision in all countries was, by and large, a national industry and generally also in public ownership.³ The liberalisation of the energy sector during the 90s changed this pattern radically and, in many countries, was often accompanied by extensive privatisation which in turn offered opportunities to foreign investors. The internationalisation of the power business stimulated growth of very large companies with geographically very wide-ranging interests. It is interesting that this global development has taken place not only in highly industrialised economies with strong power production sectors, but also in so-called Third World settings. Multilateral organisations like the World Bank and the International Monetary Fund have contributed by encouraging outside investment in Third World electricity provision.⁴

PREVIOUS PAGE: "Welcome!" "Finally we are home among our own people!" Power plant director Frank Pöhler spoke in unusually plain language when the Norwegian delegation visited Erzhausen. The participation of Statkraft has spread happiness in Germany, Wales and Sweden. Article in "People & Power", no. 1, 2009, pp. 22–23, in connection with the E.ON-agreement. To the left, Technical Director Astrid E. Løken, saying, "We couldn't have been more fortunate with our new German colleagues."

In the main, share trading and mergers generated the momentum towards globalisation. Investment in new power plants and electricity infrastructure has played a much more modest role, except possibly in some of the less developed economies. It has mainly been the established generators, with their origins in the era of nationalised electricity supplies, which provided the driving force behind this process. The French EdF, a vast corporation, and German E.ON together spearheaded expansion in Europe. Over the last fifteen years, EdF has bought into the power industries of Italy, Spain, Portugal, Sweden, Switzerland, Great Britain and Hungary. Outside Europe, EdF is at present active in China, Mexico, Argentina, Brazil, Lebanon, Morocco, South Africa and the Ivory Coast. E.ON has invested heavily in, for instance, Great Britain - not least through its acquisition in 2002 of PowerGen, with its large investments abroad, e.g., in the USA - and in Spain, Italy, Sweden and a whole raft of other countries. Companies such as the Belgian Tractebel, Italian ENEL, Swedish Vattenfall, Finnish Fortum, and, to some extent, Norwegian Statkraft, have bought into foreign markets. Non-European companies have moved into Europe, but not as energetically as might have been expected. The restraint shown by the USA has been especially

Sydkraft – Sweden: The Kvistforsens power plant's floodgate dam. The power plant belongs to the Graninge-portfolio which Statkraft took over in



noticeable and ascribed mainly to the financial problems after year 2000 experienced by several of the larger American operators.

I have referred to the way liberalisation has often arrived hand-in-hand with privatisation. Still, public ownership by the state or by local authorities has prevailed in some countries. It is also true that, in many cases, publicly owned companies have had a particularly thrusting international expansion policy. At the time of writing (2009), the Swedish company Vattenfall is still wholly state-owned. This held true for EdF until 2005, when the French state sold off some 15% of its share holding. In Finland, the state continues to hold a substantial proportion of shares in Fortum. The Italian ENEL was wholly state-owned until 1999 and, ever since, the state has remained a major shareholder; this also describes the relationship between the Spanish state and the company ENDESA. In 2009, the Norwegian Statkraft is, as we know, still wholly state-owned. At this point in time and among the leading operators in the sector, E.ON is the only company which is almost entirely privately owned. But then, E.ON was also the results of a state initiative: it was formed in 2000 after a merger between two companies – Veba and Viag – which started their lives in public ownership.⁵

STATKRAFT COMMITS ITSELF IN SWEDEN

Inside Statkraft there was much interest from the outset in the new ownership patterns that were emerging in Europe. Some national power companies, as for example the Spanish ENDESA, were part-privatised and quoted on the stock exchange already in the late 80s. It was regarded as part of a trend that would keep growing in the 90s; as the CEO Lars Uno Thulin commented in 1992: "In the years ahead, we can expect substantial changes in the Scandinavian and European power supply industries." Statkraft had no intention of watching the game from the sidelines. It had already developed ideas for a new strategy and its stated objectives included becoming "a leading northern European energy corporation".

It would be true to say that Statkraft's ambitions in the international sphere during the first part of the 90s were neither very grand, nor very concrete. The company had more than enough to cope with at home, such as restructuring in preparation for the new power market and improving its financial position (Chapter 9). But Statkraft was practically forced into going on the offensive from 1996 onwards. At this time Sweden, too, was liberalising its electricity sector. In contrast to Norway, liberalisation in Sweden was followed by an invasion of foreign firms keen to ensure a stake in Scandinavia for themselves. By the end of 1996–97, foreign companies had bought up about 20% of Swedish power production, having begun with less than 7%. The major part of this spending spree took place in 1996, when holdings worth over 20 billion SEK changed hands. Among the new foreign arrivals were the partly state-owned Finnish company



Imatran Voima Oy (IVO), which for a brief period came to be a majority shareholder in the Swedish company Gullspång. EdF also expanded in Sweden through its purchase of shares in Graninge AB. Statkraft was a third interested party and acquired an almost 15% holding in Sydkraft AB, Sweden's second largest power producer.

It was not chance that made just Sydkraft the vehicle for Statkraft's entry into the Swedish marketplace. Unlike most of the other Swedish power producers, Sydkraft had become a limited company, complete with traded shares, well before the wave of general liberalisation. It was the only sizeable company in the Swedish electricity sector with several foreign firms already in place as minority shareholders. In 1991, one of the largest producers in Europe, the German PreussenElektra (now E.ON), bought into Sydkraft. A little later, EdF and the German company Hamburgische Elektrisitätswärke joined in. ¹⁰ However, EdF sold off its shares in 1996 and now Statkraft moved to take over the French shareholding, spending in one year almost 4.4 billion NOK on Sydkraft shares. ¹¹

Statkraft later described its investment in Sydkraft as "the outcome of a wideranging survey, from the strategic point of view, of the possible Swedish options that would fit our expansion plan." In other words, this acquisition followed a thoroughly planned foreign investment strategy, which focused on Norway's closest neighbour. It all rang true enough and was fully in line with the 1992 strategy plan. True, before 1996, the company had not officially announced that expansion abroad was one of

Sydkraft – Sweden: Brynge power plant, which is among the Graninge plants which Statkraft took over in 2005.

its top objectives. The engagement in Sydkraft had not been predictable and there are reasons for thinking that more short-term factors affected the decision. With the future of Sydkraft in mind, as well as the recently opened Norwegian-Swedish power market, it had clearly worried Statkraft's management that large, expansionist European operators were gaining ground in Sweden. It goes without saying that Statkraft couldn't prevent this development. Instead, it could arm itself in good time by getting voting rights in Swedish companies, which might be one way of creating alliances with other big operators. Also, Statkraft would be in a better position to improve its insight into the Swedish industry.

It may well be that buying into Sydkraft was not planned beforehand, but obviously an expansion strategy soon came existence. In the years that followed, Statkraft steadily bought up new lots of shares until, by 2003, its holding had reached 44.6 %. Statkraft was now the second largest shareholder in Sydkraft, a position that had cost it around 15 billion NOK. E.ON, the new company formed after Preussen Elektra's mergers with other companies, had also acquired a large stake in Sydkraft; by 2003, E.ON was the majority shareholder.

A POLITICALLY CONTROVERSIAL COMMITMENT

On the whole, Statkraft's owner, the Norwegian state, agreed with the company's policy to become "go Nordic". Both the social democratic government under Jagland (1996–97) and the first centre-right government under Bondevik (1997–2000) started out by supporting the plan to make Statkraft big enough to be a force to reckon with in the eyes of major Scandinavian and European competitors. At the same time, expansion at any price was frowned upon. This attitude was clearly demonstrated when Sydkraft had been selected as a target company. Sydkraft had invested a great deal in nuclear power generation since the 60s, ¹³ and many politicians were genuinely disturbed when Statkraft, and hence the Norwegian state, became co-owners in a nuclear energy venture. It did not fit in at all with the goal of making Norway a world leader in environmental policies, as was increasingly strongly advocated by the Storting and perhaps especially by the Bondevik government. Also, Norway was among the countries where public opinion was particularly suspicious of nuclear power. Unsurprisingly, Statkraft's new role caused strong political reactions. Several parties campaigned for an order to instruct Statkraft to get rid of the Sydkraft shares. ¹⁴

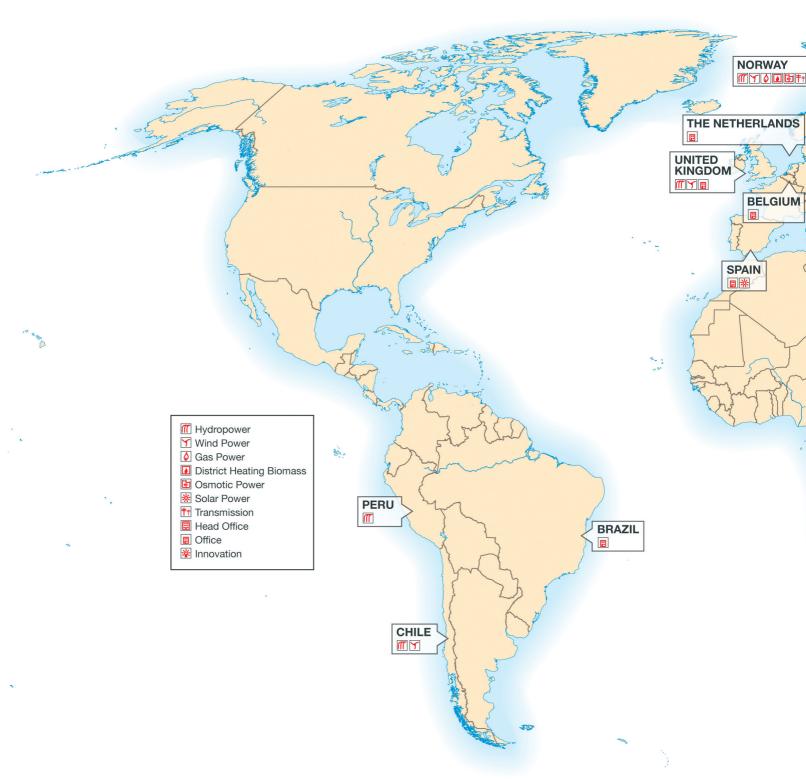
This proposal was never a frontrunner, even though many agreed to promote it in principle. However, the Storting majority felt that the more important issue was Statkraft's right to act freely in its own best business interests. To instruct the company to sell off its shares would be in obvious contradiction to the Storting's own edict, namely that it should be run in a strictly businesslike manner. Now that Statkraft had

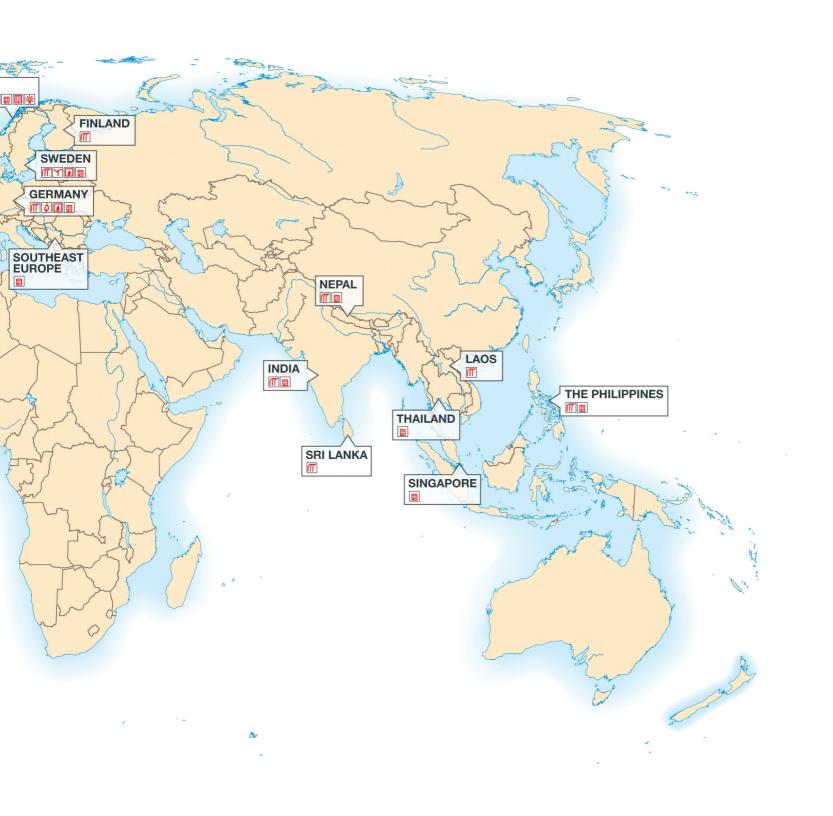
recently been granted independence, it was no longer self-evident that its activities must conform to political criteria. Its independence had to be respected, even in this case when it had moved so far outside the boundaries of what initially seemed politically desirable. The issue didn't become any less pressing once the pro-environment, centre-right Bondevik government came into power in the autumn of 1997. The ruling coalition included two parties committed to green policies, the Kristelig Folkeparti and Venstre, and now also the Senterparti, which had argued while in opposition that Statkraft should be instructed to back out of the Sydkraft engagement. The Senterparti was actually given responsibility for the Ministry for Oil and Energy and hence for Statkraft in relation to the political establishment. Once the Senterparti was part of the government and in charge of a ministry, it didn't pursue its previous proposal. Marit Arnstad, the Minister, did however exert quite strong pressure to stop further Sydkraft investments in 1997, when Statkraft wanted to buy more shares. Still, there was no official attempt to veto the deal and it went ahead. As we have observed, Statkraft bought into Sydkraft both under the Bondevik and other, later governments.

THE ENVIRONMENTAL PROFILE: FROM DENIAL TO OPPORTUNITY?

The Sydkraft case illustrates the point that being in business abroad poses more general challenges. Norway is unique in that hydropower stations generate almost all its electricity, i.e., the nation's power depends on clean, renewable sources of energy. In other countries the proportion of "dirty" power production from, for instance, nuclear reactors or coal-fired stations, is much larger. Of the Scandinavian countries, both Finland and Norway consume considerable amounts of power from nuclear and fossil fuels, while Denmark depends almost exclusively on coal. In most countries on the European continent, coal-fired and nuclear stations are also the dominant sources of electricity. In practice then, the next time Statkraft evaluates yet another foreign purchase, it is very likely that it will face the same dilemma as in the case of Sydkraft. How ought the company meet this challenge?

Actually, Statkraft carried on buying up Sydkraft shares, despite the manifestations of political distaste. When, after 2000, mergers with other foreign firms seemed ever more likely options, all the potential partners had nuclear generation in their energy portfolios. However, Statkraft never ignored the concerns of its owner, the Norwegian state. That the merger plans came to nothing was probably not due to political pressure, but there is no doubt that the company profile, as it took new shape during the 2000s, made it harder to go ahead with investments in what we call "dirty" power production. 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. Increasingly, its goal is to be seen as an environmental beacon in a Europe still dependent on nuclear and coal-derived energy.

It was in 2001 that the company's exceptional status as an environmentally sound business was used to competitive advantage for the first time. In that year, its new mission statement announced: "It is our vision that Statkraft will be a European leader in the area of environment-friendly energy generation." Later, this goal has become still more strongly emphasised, while at the same time any ambition to join large alliances has been toned down. During the last few years, the catchy titles of the annual reports testify to the way the company's environmental mission has come to the fore: *The Time Has Come for Clean Energy* (2006), *You Can Get Far with Clean Energy* (2007) and *Growth with Clean Energy* (2008). The spirit of environment-friendliness also permeates the company strategy plan for 2009 to 2011, as for instance in the following: "As Europe's leader in renewables, we will meet the world's need for clean energy." 17

GROWTH IN GREEN ENERGY

Statkraft has backed its clean energy image with action and, since the late 90s, has grown as a company primarily in accord with its messages about producing environmentally friendly, renewable energy. In 2005, it did a deal with E.ON Sweden, a daughter company of the German giant E.ON, and bought twenty hydropower stations in Sweden and four in Finland at the cost of a good 4.1 billion NOK, adding over 1.6 TWh of hydropower to the company's annual power output. The generating stations were managed by the Graninge production company and its majority shareholder was Sydkraft, which in its turn was controlled by E.ON. Once the deal was done, Statkraft established two new companies to take charge of the Swedish and Finnish stations, called respectively Statkraft Sverige AB and Statkraft Suomi Oy. Next, in 2008, the already mentioned exchange deal with E.ON was completed. It added many more hydropower sources to Statkraft's portfolio, corresponding to an increase in annual output of more than 4 TWh and brought the company to the position of being Europe's largest producer of renewable energy.¹⁸ The deal, in which E.ON took over its shareholding in Sydkraft, also meant that Statkraft was relieved of its ownership of nuclear generation capacity. While this might not have been the chief motive for the transaction, it was an outcome that fitted in very well with the company's increasing concern for its green profile.

The 2008 transaction was of course an exchange of assets and linked to the agreement between the partners that Statkraft would hand over its entire lot of Sydkraft shares to E.ON. As we have noted, since 1996, Statkraft had gradually bought up



Sydkraft shares and acquired an ownership holding of 44.6%. E.ON already had the rest, i.e., just over 55%. ¹⁹ At that point, E.ON was the overall majority shareholder, while Statkraft held a blocking minority position. For a long time, the situation caused speculation about what Statkraft's future intentions might be, since E.ON had consistently let it be known that it had long-term ideas about how to handle its leading role. For instance, it announced in 2001 that it wanted to buy the entire company, but at that time, Statkraft had refused to sell its shares. Negotiations began again and lasted for about a year, between 2007 and 2008. Finally, the partners came to an agreement. Once Statkraft had signed the contract, its first and until then largest venture outside Norway had been dismantled and replaced by other commitments – commitments of a kind which anyway fitted in better with its industrial strategy as it had taken shape in the 2000s.

Hürth, Germany, 17th October, 2007: King Harald opening Statkraft's new gas power plant, Hürth Knapsack, on Wednesday. On the left, Minister of Industry Dag Terje Andersen. Photo: Bjørn Sigurdsøn / SCANPIX

STATKRAFT AS A EUROPEAN SWING PRODUCER

The E.ON deal in 2008 made it clear that buying Sydkraft shares had been an exceptionally profitable business. The net profit after the completion has been estimated at a generous 25 billion NOK. It would be worth speculating about the sale on purely financial grounds. One important factor was that E.ON held a controlling majority in Sydkraft and wished to stay in control. In other words, Statkraft had no hope of acquiring a majority position in the foreseeable future or to then itself run the Swedish company. However, the swap of shares for generating stations was clearly also based on industrial considerations. In exchange for the indirect power that goes with being a large shareholder, Statkraft become the owner in charge of production units in

Sweden, Finland, Germany and Great Britain. Plants which were directly controlled did not only provide income, but could also be useful in a strategic sense. The executive owner has access to much better information about the relevant foreign markets. Being aware of what is going on abroad is becoming steadily more important, not least because of the time spent on the company's strategic aim of becoming a European swing producer. A swing producer invests in order to enter the market when – as it was expressed in Statkraft's current strategy – "fluctuations in demand prices make it attractive to do so." ²⁰

As observed earlier (Chapter 9), Statkraft had built up a solid skills-base in production analysis throughout several decades prior to the liberalisation, and these skills had stood the company in very good stead, both in national and international power markets. Statkraft's massed hydropower plants also convey a remarkable flexibility, especially when compared with the thermal energy sources typical of the European continent. As the Nordic region is becoming ever more closely integrated into Europe, Statkraft has increasingly known how to exploit these advantages. The company's objective is to maximise income by strategic use of the flexibility of its Norwegian production and run its stations at full capacity when prices are at their highest. But, for such a strategy to succeed, the company depends on excellent, first-hand information about the markets, which is best obtained through ownership of production units and hence immediate access to the national trading floors.²¹

Buying up production capacity can be regarded as analysing a marketing strategy with its roots in the mid–90s and taking it forward into the present. The value of market information was recognised as a major reason for Statkraft setting up a sales office in The Netherlands in 1998, and another in Germany the following year. The rationale was the company's need to follow the new-style trading, which had come into being after the deregulation of the power markets in these countries. Later, more offices were opened in Sweden and in southeast Europe. The network of such centres of trade has since been greatly extended and serves a crucial role for Statkraft's current European ambitions. Statkraft will almost certainly continue to work on establishing its role as a swing producer and, in the years to come, this strategy will be assisted by the strong likelihood of new, direct cable connections being laid between Norway and the continent. In this context, drawing steadily closer to Europe can only be expected to further boost Statkraft's potential for growth.

INSIDE ASIA AND LATIN AMERICA

Statkraft's international ambitions have been focused on Europe, and on Scandinavia in particular. However, the company has also gradually developed a considerable influence outside Europe, in the first instance in Asia and Latin America. Commitments

outside Europe had been initiated already in the early 90s and were based on considerations different from those driving the European expansion. The differences derived partly from the fact that the investments were often made in typical developing economies, notably in Asia. These ventures might at first have been regarded as marginal to Statkraft's internationalisation drive, but with time they have come to take up a more central role.

The start of engagements outside Europe began in the 90s, when Statkraft undertook to run two Asian hydropower projects in respectively Nepal and Laos. In Nepal, the task was to build a power station with an output of 60 MW on the River Khimti-Khola, and in Laos a station of 210 MW on the River Nam Theun, a tributary to the Mekong. After long sessions of negotiation and planning, both projects got underway in 1996-7. The Laos station came on stream in 1998, and the Nepal station about two years later.

The contracts in Nepal and Laos did not come about because of a targeted effort by the Statkraft management, but were the outcome of work done by a small group of company employees keen to initiate projects in developing countries.²² The idea was that Statkraft and its crews of Norwegian engineers could provide such countries with valuable skills in, for instance, technical and environmental aspects of electricity generation. Part of the technology transfer was of course also that, after construction of power stations had got underway, the projects would further economic development. From this point of view, they were undertakings consistent with a long history of Norwegian engineers serving as hydropower consultants in developing countries. But in contrast to the traditional role of providing expert advice, these new Statkraft ventures entailed a complete package of building, owning and running the power stations, which were meant to yield business profits.

Both in Laos and in Nepal, the hydropower projects were set up as joint ventures with either private or public national agencies. Either way, Statkraft wanted them to

be structured as independent lim-

ited companies.²³ This was to insure against losses from the undertakings, which were regarded as quite risky. Great stress was put on the power stations entering into longterm, stable delivery contracts.24 Another provision was that the enterprises must be organised as socalled BOOT projects. The BOOT acronym stands for Build - Own

- Operate - Transfer, meaning that







Text from "Fossekallen" no. 1, 2007, pp. 34–35: On the plant grounds of the Theun-Hinboun Power Plant Ltd. in Laos, they have their own clinic where all the inhabitants of the region can get free health care. The clinic is very well attended. The power plant also has its own school where the best students in the area get their education. Caption: "Good morning!" The students at Theun Hinboun Private School are polite even though they are disturbed in the middle of English class.

the same company is responsible for building, ownership and operational management. The idea is that this tight organisation will ensure stability, all the way from the planning stage to running and maintenance. Transfer, the last component, stands for the promise that ownership of the power station will be transferred to the host nation after a specified number of years. The Norwegian legislation on concessions and the socalled "lease obligation" (see Chapter 1) provided an instructive model for the clause stating that, after a certain number of years, the hydropower stations become state property.²⁵ In other words, Statkraft brought to these deals with developing countries not only technological, organisational and administrative skills, but also important models for legal practice and for effective utilisation of natural resources.

There were setbacks to progress in both Laos and Nepal, especially in the latter. Despite this,

Statkraft continued to invest in Asia. In 1996, it entered into a preliminary contract with the Indonesian state to construct a sizeable hydropower station in West Sumatra and followed up by opening a dedicated office in Jakarta. The same year saw the start of negotiations with the authorities in India about two joint hydropower projects. Then, in 1997, the entire region underwent an economic crisis and various projects were put on hold. Later, the management leapt back into action. As the company's Annual Report for 1998 put it: "The large potential for construction and the increasing demand for electricity together open up opportunities for building new hydropower stations as well as participating in share trading and privatisation deals." After 2000, forays into Asia started up in earnest again. Apart from managing the companies in Laos and Nepal, at the time of writing Statkraft is engaged in hydropower station construction and power production in India, Sri Lanka and the Philippines, and is in the process of building two new hydropower stations in Laos.

Latin America is the other non-European region that Statkraft has targeted. The first serious shift towards that compass direction was made around 1997. Just like Asia, Latin America had large, unexploited waterpower resources. Statkraft set out to explore Peru, and, in 1998, applied for permission to construct a 525 MW hydropower station serving the capital city, Lima. The project never really got off the ground, but later, in 2003, the company bought two medium-sized Peruvian power producers.

That year, it also joined forces with an Australian company and started building a 155 MW hydropower station near Santiago in Chile.²⁸

Statkraft has also established itself in Brazil, where the authorities by the late 90s were well on the way to deregulating and privatising the electricity supply. As part of this process, formerly state-owned companies were up for sale, and permits to construct generating stations auctioned off to private operators. In fact, Brazil was not the only nation in the region that was going ahead with liberalisation and privatisation during this period; other states were following the same trend. Statkraft staff regarded the reforms as openings to great new vistas. As the Annual Report for 1997 said: "There is a considerable degree of privatisation going on [in Latin America], which helps to create interesting business opportunities." Although Statkraft so far has only a modest stake in Latin America's power production, there is every reason to believe that, in the years to come, the company will continue to invest in this and other regions outside Europe. One piece of evidence is the formation of company SN Power.

CREATING A NEW COMPANY: SN POWER

In 2002, Statkraft decided to set up a new company, SN Power AS, to handle the non-European side of its business. SN Power was established in collaboration with Norfund, a state fund for investment in business activities in developing countries. Norfund's objective was to collaborate closely with private investors and allocate venture capital to suitable projects. Hydropower capacity was, and is, a favoured funding sector, in part because Norway has exceptional expertise to offer. Statkraft was able to share its objectives with Norfund, and rely on its solid capital base. The Statkraft-Norfund partnership entailed each contributing half the equity for the new company. Statkraft recognised that it was important to have a stable, long-term partner with whom to share the risks of non-European ventures, and this joint project satisfied the need. SN Power now channels most projects in Asia and Latin America.

The setting up of SN Power reflected the need to minimise risk, but also an increasing interest in exploiting new opportunities for expansion. As early as 2003, the first full business year for SN Power, it made hefty investments in the form of purchases of existing enterprises in Sri Lanka and Peru, and also in a hydropower project in Chile. The company stated that its aim was to "continue to pursue investment opportunities in selected countries in Latin America and Asia." Latin America had been given a special place as a target region. In 2007, when Statkraft bought the Peru-based power producer Electroandes, it was the largest investment so far. The deal made Statkraft into the fourth biggest producer in the country.

The reorganisation of SN Power in 2008 was another expression of its growing ambitions outside Europe and entailed Statkraft acquiring 60% of the equity. The



In 2008, Norwegian newspapers reported on reprehensible working conditions at the hydro power project Allain Duhangan in India. Statkraft was heavily engaged in this project through its ownership in the company SN Power Ltd. The papers reported on 11 deaths and 82 injuries from the start of the project in 2006. Such cases are extremely compromising, and highlight the problems of "First world companies" engaging in developing countries.

agreement also allowed an option to buy up to 67% until the cut-off date of 2015. Norfund's side of the deal was an option to sell up, party or wholly, during the same period.³⁴ Statkraft explained that it wanted to own a greater stake in the company in order to follow up its "ambition to develop the role as a global niche operator in the renewable, and specifically the hydropower sector." CEO Bård Mikkelsen stressed that the agreement would also provide "a strong platform for a long-term, global investment policy." More precisely, the goal was that SN Power would manage a total production capacity of 4000 MW before 2015. It is an ambitious plan, but will, if it succeeds, increase the existing capacity four times (in 2009, SN Power manages, or is constructing, plants to a capacity of 940 MW).

STATKRAFT: A "GREEN GLOBAL DEVELOPER"?

We have seen that Statkraft has recently made much of its image as an enlightened, environment-oriented company, engaged in producing clean, renewable energy. The non-European investment drive emphasises this stance: from the start, it has been directed almost exclusively towards hydropower. Initially, this may well have been a function of the company's expertise, rather than a conscious environmental policy. But, as climate change has become an issue of global importance, Statkraft has increasingly made the environment an element in its strategy outside Europe. This was expressed very clearly in the strategic plan for 2009–11, which states that Statkraft, through its allied company SN Power, has set itself the objective of becoming a "green global developer". Hydropower will remain a main area of investment, but the plan also indicates an interest in energy sources such as wind, solar radiation and geothermal heat as well as other options. Such a dedicated policy is felt to "provide a strong starting point for a long-term global expansion drive".

To project a positive environmental image is very much in line with contemporary thinking and obviously provides an excellent basis for international expansion. However, many other factors will affect the way Statkraft develops. In a global context, it is still a small company. Also, Norwegian legislation on ownership and related matters restricts closer alliances with large international operators. This might well complicate the company's progress in a business where the trend towards consolidation into larger units looks like persisting for years to come. In the future, there might of course also be other obstacles to international expansion. For instance, foreign owners of the electricity supply industry may arouse local suspicion. Today, it seems improbable, but one of the most important insights of history is that no social structure and no progress can be trusted to be permanent. Change can affect apparently deep-rooted phenomena such as the progressive trade globalisation during the last decade or two.³⁵ Besides, because supplying electricity is a business with a critical social as well as strategic role, it is always going to be subject to special scrutiny. Should it turn out that, for example, foreign ownership tends to be thought of as contrary to national interests, it would be naïve to trust old promises of no policy reversals, or of no return to public ownership. It is surely enough to remember that supplying electricity was initially seen as an international business, only to be nationalised in almost all countries by the 1930s, precisely because of concerns about social control.³⁶ This state of affairs lasted for a few decades. It should also be recalled how in some countries, including Norway, strict legal control is still exerted over foreign ownership in the electricity sector. Whether internationalisation will carry on regardless, slow down, or even be reversed, is going to depend at least in part on how the international operators go about managing their foreign enterprises. The challenge is real: Statkraft must be aware of it and able to meet it with determination and skill.

NEXT PAGE: Statkraft as "green global developer"? Picture at conclusion of work – environmentally forward-looking: Man on windmill.



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Åberg, Alf, See under "A".

Endnotes

INTRODUCTION

- 1 http://www.kraftnytt.no/default.asp?page=21866&article=31424
- Among other forays, both Høyre and the other large centre-right party, the Fremskrittsparti (Progress Party) have raised the issue several times, the latest in the autumn of 2008. See e.g., the newspaper *Aftenposten*, 7th August 2008.
- 3 When one of Norway's largest polling organisations (MMI) carried out an opinion poll in 2004, two thirds of the cohort supported public ownership of power generating capacity. Only 1% registered a positive response to the notion of foreign owners of Norwegian hydropower stations. Similar results have been produced by other investigations of this kind.
- 4 Unsurprisingly, this view is commonly held among conservative and neo-liberal politicians and academics, but seems increasingly to be part of the social democratic discourse in many countries. There are neo-liberal academics who reject the whole idea of public ownership; a highly regarded World Bank economist has actually labelled it "a deadly disease", as quoted in Kikeri, Nellis and Shirley (1992). The less extreme arguments include examples of public enterprises characterised by poorer profits and lower efficiency, as compared with private counterparts. For a Norwegian version of this view, see Roland, Norman and Reve (2001).
- 5 These points are discussed in Chapter 1.
- 6 See Millward (2005), Chapter 15. Other studies have shown that this is also the case in many other European countries, e.g. Clifton, Comín and Días-Fuentez (2006).
- 7 This point will be discussed in Chapter 7.
- 8 One case in point is the French company EdF, which together with the German E.ON ranks as the largest power producer in Europe. Until 2005, when the French state sold 85% of its holding, EdF was fully state-owned. The Swedish company Vattenfall, which is at present a major operator in the German energy market, is still state-owned. This apparent paradox is also discussed in Clifton, Comín and Días-Fuentez (2007).
- 9 See e.g., Newbery (2004) and (1999).
- 10 An important contribution to new institutional theory can be found in North (1990).
- 11 This subject is looked at in detail in Chapter 8. Here, it is worth remarking that the economists who created the basis in economic theory for the market reform, had over several years studied the power exchange market set up by Samkjøringen Norge.
- 12 As, for instance, in Canada and France. Re Canada, see Dunsky and Raphals (1998). There were great expectations linked to the promotion of effective competition also in Great Britain, where the national, state-owned monopoly CEGB was carved up into several regional

- companies. There were later privatised as part of the deregulation process. See Newbery (1999), Chapter 6.
- 13 See e.g., North (1990) and David (1985).

- 1 Lecture arranged by the Norwegian Electrotechnical Society in March 1925. The text of the lecture is printed in Stuevold-Hansen (1925), p. 4.
- 2 Personal communication. My source for this story is Jørgen Sørensen, a civil engineer, who did a lifetime's work for NVE, also during Fredrik Vogt's time as Chief Executive.
- 3 The estimates have increased as the technology has improved. The figure quoted here has however changed little since the 1960s and has also been chosen as the basis for the thorough figures calculated by Norway's Watercourse and Electricity Board at the end of that decade.
- 4 For a wide-ranging account of Norwegian watercourses, see Hveding (1992).
- 5 Ibid
- 6 Large industrial development also took place at some of the bigger inland waterfalls. In the first instance, these included the Rjukan falls in Telemark's Vestfjord Valley, where the industrial company Norsk Hydro installed a power station. When it started up in 1911, the Vemork station generated 145 MW and was, in its time, unrivalled for size and capability. It supplied the power to the company's saltpetre factory, completed at the same time as the Vemork station and situated six kilometres further down the valley. In the history of Norway, this early development of the Vestfjord Valley is seen as the first really great adventure of Norwegian industry and has acquired an almost mythical significance. Now Norsk Hydro has constructed a new power station at the same place, but inside the mountain, and kept the Vemork power station as a museum. Gjølme Andersen (2005) has discussed the industrial expansion of Norsk Hydro in Vestfjord Valley.
- 7 For details about France, see Lévy-Leboyer (1987). Germany is discussed in Hughes (1983), Ch. 14.
- 8 The Swedish historian Alf Åberg has claimed that, generally speaking, creating very large industrial companies was a necessary condition for profitable use of Sweden's hydropower. In Åberg's view, this applied in particular to non-urban electricity supplies. His point is that only the larger companies could afford to install power stations on the large falls of waterrich rivers: "First when the big power companies had been formed was it possible to envisage more general electricity consumption outside the cities." Cf. Åberg (1962), p. 110.
- 9 The coastal towns in East Norway, which are close to a watercourse, include Kristiansand, Arendal, Kragerø, Skien, Porsgrunn, Larvik, Drammen, Moss, Sarpsborg, Fredrikstad and Halden.
- 10 During the second half of the 18th century, waterwheels provided momentum to the machinery of the earliest English textile mills. In the USA, waterpower was the dominant energy source for industries until well past the middle of the 19th century. See Nye (1998), Ch. 2.
- 11 And so it remains, both in Europe and worldwide. In 2007, over 40% of the world's electricity needs were met by coal-fired power stations. The next most important energy source is gas, generating just under 20% of all electricity, followed by hydropower (about 16%)

- and nuclear power (about 15%). In: *Key World Energy Statistics* 2007. International Energy Authority (2007), p. 24.
- 12 After the 1860s, in particular, many Norwegian sawmills changed to steam, because it set the business free to grow independently where waterfalls were located. For further discussion of the introduction of steam to the sawmill industry, see Sejersted (1993).
- 13 Heggstad et. al (1951), Figure 4.
- 14 Sandberg (1951), Table X.
- 15 Teknisk Ukeblad, april 1947, s. 241 [Technical Weekly, April 1947. p. 241].
- 16 Economic historians usually recognise three "industrial revolutions". The first stage began in Great Britain during the 1780s and 90s and depended on steam-driven machinery, increased use of iron and, increasingly, manufacturing in factories. The second stage takes place between approximately 1850–1950, a period characterised by the growth of large business conglomerates, the introduction of steel, electrical power and, later, chemical processes on an industrial scale. The beginning of the third stage coincides with the end of WW2 and continues until the present. The dominant processes are derived from the development and commercialisation of electronics.
- 17 Just (1948), p. 65 et seq. Later on, the company also began to produce zinc in the same factory.
- 18 For an overview of the power-dependent industry in Norway, see Hodne and Grytten (1992), Chapter 2.
- 19 NVE (1946), Figure 2.
- 20 Stuevold-Hansen (1925); Thue (1994).
- 21 Laugstol Brug (1910).
- 22 The history of the Pearl Street Station is extensively discussed in Hughes (1983).
- 23 Millward (2005), Figure 2.2.
- 24 See Nye (1990) for information about the USA, and Armstrong and Nelles (1986) for information about Canada.
- 25 Apart from Hammerfest, the towns/ cities were Oslo and Larvik (1892), Lillehammer (1894), Ålesund, Fredrikstad, Kongsberg and Voss (1896), Røros and Gjøvik (1897), Tromsø (1898), Tønsberg, Hamar, Hønefoss, Holmestrand (1899), and Sarpsborg, Bergen, Halden, Kongsvinger, Arendal and Kristiansand (1900).
- 26 Stuevold-Hansen (1925), p. 4.
- 27 For an overview of Formannskapsloven (Chairmanship Act), see for instance Bergsgård (1937).
- 28 Næss (1987), p. 107 et seq.
- 29 Ibid.
- 30 Danielsen (1991).
- 31 For a good introduction to the American version of the "civic populism" movement, see Boyte (1996). For Canada, see Armstrong and Nelles (1986).
- 32 Beyond the 1920s, more than 80% of total power generated in the USA had become dominated by five large holding companies, as discussed in Tobey (1996), p. 10. At an early stage, the large American corporations had also established themselves in other countries and, in the course of the interwar years, grown into multinational conglomerates with worldwide interests in electricity provision. An analysis of their growth and further development can be found in Hausman, Hertner and Wilkins (2008).
- 33 Nelles and Armstrong (1986).

- 34 Cf. Sejersted (1993). Francis Sejersted explains this structure as related to the dominant role in the 19th century of petty bourgeoisie, with its highly developed "democratic-anarchic" norms and strong tendency to favour the local rather than the state. Besides, according to Sejersted, these attitudes have remained constant to an astonishing degree throughout the 20th century.
- 35 It is interesting to note that the local planning authority was primarily rooted in custom, rather than law.
- 36 This was the case for instance with the gasworks in the towns of Drammen and Moss, which both came on stream in 1856. The Moss town council was the sole owner, and in Drammen, the council had entered into a partnership with private capital. See Holm (1956); Skaug (1956).
- 37 When private persons or companies were refused planning permission, the reason was of course not always that the local authority wanted to control production. In some locations, where the authority was already in charge of a gas supply, a private electricity provider was often most unwelcome, because it was feared that gas would lose out in competition with electricity. During these pioneering years, only one Norwegian town council with a council-owned gas supply allowed private electricity provision: Kristiansand.
- 38 With time, many gasworks were of course taken over by the local authority. But the authority was not the driving force behind this enterprise.
- 39 Rinde (2005).
- 40 Nye (1990).
- 41 Quoted from Thue (1994), p. 21.
- 42 Scattered populations and demanding topography made it expensive to extend a network of railways over large parts of Norway. For a small country, this enterprise also consumed a great deal of the available capital. Furthermore, Norway lacked significant coal deposits, and to import coal was relatively costly, because the country was geographically marginal to the great industrial and population centres on the continent. For a discussion of the development of railways in Norway, see Bergh (2004).
- 43 Electricity was the basis for a fundamental change in the process of industrial development process you might say, for initiating a new era, according to Freeman and Soete (1997).
- 44 For a classical discourse on the triumph of technology in the 19th century, see Mumford (1934).
- 45 On the continent, watercourses were much more important than land routes for transport and communication well into the 14th century.
- 46 For a comprehensive discussion of the development of a European regulatory system for river systems, see Teclaff, (1967, 1972). Teclaff also emphasises two other circumstances that contributed to changes in the 19th century: first, the fact that the principle of freedom of navigation was gradually placed under international law, and second, the consolidation of the nation states, which also added to the strength of official control and regulation of watercourses.
- 47 However, some countries went further still in the direction of allowing interventions in river systems. In 1919, France introduced a concession duty as part of watercourse regulations, a decision that favoured industrial exploitation and weakened the position of the riverbank owner. Italy introduced similar statutes after its unification in the 1860s. Variations on the theme were seen in German states and, in some, flowing water became public property.
- 48 Teclaff (1967).

- 49 The exceptions were some of the larger river systems in the eastern part of the country. However, only two Norwegian watercourses were canalised: the Skiensvassdraget, to the west of the Oslo Fjord, and Haldenvassdraget, to the east of the Fjord and along the Swedish border.
- 50 The Timber Boards represented the partnerships that controlled the timber trade and defined the partners' rights and obligations. The first Timber Board was set up as early as the second half of the 16th century. It controlled timber flotation in the River Glomma, the longest of all the Norwegian river systems, and the largest in terms of water volume. The Glomma enters the sea at Fredrikstad on the eastern shore of the Oslo Fjord. By the 1660s, the first Board was in place for Skiensvassdraget, which enters the sea at Porsgrunn on the western shore of the Fjord.
- 51 In the large river systems, the Joint Timber Associations undertook major changes in the regulations with the aim of improving the conditions for timber floating by damming to ensure sufficient water levels, widening the river bed and so forth.
- 52 Fishing, another important enterprise related to the large watercourses, was not really in conflict with the exploitation of the falls. Salmon fishing was the most profitable form of river fishing, but this activity too could be coordinated with power generation by constructing salmon ladders and other measures. As the salmon gradually became more rare and finally disappeared from many rivers, the blame should fall, not on the power stations, but on other forms of industrialisation. In the first place, we should consider the pollution from the numerous paper mills, which crowded the riverbanks, especially in Østlandet, from the 1870s onwards.
- 53 For watercourse legislation in Norway, see Thue (2003), Chapter 2; also Motzfeldt (1908).
- 54 The concept "industrialisation of rivers" is borrowed from Eva Jakobsson. It discribes the more extensive use of watercourses that accompanied modern industry. See Jakobsson (1996).
- 55 In 1888, the Statsborgerloven (National Citizen Law) actually stated that foreign companies and private individuals should not have the opportunity to acquire real estate in Norway unless royal permission had been granted. But until the 1900s, the law was hardly ever used to try to prevent foreign acquisitions of waterfalls. The application of Statsborgerloven is discussed in Annaniassen (1983), Chapter 1.
- 56 Among others, the English manufacturing company Kellner Partington Paper Pulp Co Ltd was a main purchaser of the Sarpsfossen (Sarp Fall) in the River Glomma. A bit further upstream, the German company Schuckert was the key agent in construction of the generating station at Kykkelsrudfossen (Kykkelsrud Fall).
- 57 For example, in 1911 the "Law concerning enforced handing over waterfall rights to the local authority to enable certain objectives" came into force. It permitted local authorities to expropriate privately owned waterfalls, if it could be shown to be necessary in order to ensure the electricity supply within the relevant authority area.
- 58 Only two of the private companies in Norway reached serious levels of power provision to the public. One was Treschow-Fritzøe, which delivered electricity to the main part of Vestfold county, on the western side of the Oslo Fjord. The other was Hafslund, which delivered electricity to local councils, especially in Østfold County on the eastern side of the Oslo Fjord. On the western side of the Fjord, by 1920, Treschow-Fritzøe had however sold both its generating and its distribution facilities to the Vestfold local authorities. Hafslund kept its role as public power provider in the eastern side and has remained the only Norwegian private company in this position.

- 59 The economist and historian Wilhelm Keilhau has been a prominent exponent of this opinion one that has actually been very popular among historians for a long time. See Keilhau (1938), p. 158.
- 60 Lange (1977).
- 61 It is true that Lange (1977) bases his arguments on empirical investigations into selected cases of concessions and thus has the best evidence for his conclusions. But Lange primarily examines the outcome of the legislation before the introduction of the restrictive acquisition law of 1917 and does not deal with subsequent developments.
- 62 Nordby (1992).
- 63 Thue (1994), Introduction.
- 64 Norway held this rank also after 1920. Timo Myllyntaus collected international data, which confirm Norway's odd position. By 1938, its average consumption was 3,064 kWh. Compare this with the corresponding figures for the next four top ranking countries: Canada, Switzerland, Sweden and the USA, with average consumptions of respectively 2,339, 1,324, 1,296 and 1,092 kWh. True, Myllyntaus's figures are based on slightly uncertain estimates, but nonetheless indicate the main features of consumption records. See Myllyntaus (1992), Table 4.2.
- 65 Nye (1990), Chapter 7.
- 66 Tobey (1996), Chapter 1.
- 67 Norwegian electricity companies almost always use prepayment tariffs and charge their customers by "effect", i.e., for a certain quantity of electricity. The tariff stimulates high consumption at no extra cost, provided that the total stays below the pre-paid level. Using this system was of course partly due to the energy supply to hydropower stations that is, the flowing water being free of charge. It makes it unnecessary to use energy-based tariffs requiring payment per kWh. Local authorities were accused of wanting to stimulate consumption by allowing prepayment tariffs to become so widely used. Also, in relation to other countries rich in hydropower, this particular form of prepayment stood out as a Norwegian oddity. It has come to be regarded as an essential cause of the speedy and extensive spread of electricity use. See Rogstad (1939).

- 1 The existing state-owned power stations were small and served primarily other state enterprises, above all the railways.
- 2 Examples include Oslo City Council, which secured large concessions in Hallingdal, Buskerud, and also Larvik Council, with its concession for the Tokke watercourse in Telemark.
- 3 Thue (1994), p. 81 et seq.
- 4 The industrial group Norsk Hydro had bought up large sections of the most promising watercourses in Telemark, Østland district with the largest hydropower resources. In Østfold, the industrial company Hafslund had at an early stage acquired several of the best waterfalls on the Glomma, the largest river system in the country.
- 5 The USA pioneered this area. An overwhelming wave of mergers took place in the years just before and after 1900. Naomi Lamoreaux has written a fascinating account of this phenomenon (Lamoreaux, 1985). The trend towards business mergers in the large European countries

- is discussed in Chandler, Amatori and Hikino (1997). For a review of cartel formation in Europe, see Schröter (1996).
- 6 The concept "democratic capitalism" is discussed in Chapter 1. Cf. Sejersted (1993).
- Among other occasions, the problem of monopolies had a high profile in the context of revision of the concession laws during the time leading up to 1917. Anders Haaland emphasises this: "While initially, the defence of the right to national financial self-determination had been the central issue, the emphasis of the government's arguments markedly shifted towards a desire for across-the-board social control of the industrialisation process and also fear of monopoly situations;" see Haaland (1995), page 77. Erling Annaniassen has shown that the trend towards monopoly formation was prominent already around 1900, and more specifically in connection with the industrial company Norsk Hydro and its waterfall purchase and power station construction in Telemark; see Annaniassen (1983), p. 72 et seq. The so called Brock-Utne committee, which in 1907-1908 examined the new concession laws with reference to electricity transmission, pointed out that the state must have the option to refuse the laying of power cables in certain cases, for instance when it saw a "risk of monopolisation of electrical energy provision"; see Indstilling fra den av Departementet for de Offentlige arbeider under 12te oktober 1907 opnævnte komite til utredning av spørsmaalet om en endring i lovgivningen om elektriske kraftledninger [Presentation by the committee appointed on 12th October 1907 by the Department of Public Works to investigate the matter of a change in the legislation concerning electrical power cables].
- 8 During the years leading up to 1920, and especially during the First World War when the demand for power increased sharply, there was a steady increase in the number of municipalities and district councils, which were buying up the larger waterfalls; this was especially the case in the middle of eastern Norway. In 1917, the capital city decided to buy rights to the large Hols watercourse in Hallingdal, Buskerud. Also, the district of Vestfold, a comparatively wealthy area, considered at the same time the option to buy concessions as far away as in the western region. There was a potential here for a rapid escalation of differences between the rich localities and regions, whose income was sufficient to acquire large, exploitable waterfalls, and those areas too poor to get their share of the bounty.
- Among others, the purchase of Tokke is 1917 was justified on grounds of fair distribution; see Thue (1994), p. 87.
- The members of the so called "Vannfallskommisjonen" (Waterfall Inquiry), set up in 1911 with the brief to work out a programme for the exploitation of the state-owned waterfalls, were among those who expressed their scepticism about the state becoming engaged in power production on a big scale.
- 11 This took place in certain instances; among other cases was the sale in 1916 by the state of the Tafjord falls in Møre and Romsdal district to a newly established local electricity company, jointly owned by the neighbouring local authorities.
- 12 Hodne (1981) p. 454 et seq.
- 13 Keilhau (1927), p. 283 et seq.
- 14 Cf. the energy statistics in Stoltz (1950).
- This was true both for industries in which electrical engines were widely used, and homes where paraffin lamps had been replaced with bulbs and, especially, coke and coal stoves with electrical cookers and radiators. People had even started buying electrical heaters. At the beginning of the war, the country as a whole had installed electrical equipment for cooking, heating and other domestic uses with a total effect of more than 20,000 kW. Six years later,

- in 1920, the corresponding figure was 177,000 kW. Most of this increase happened during the years between 1916 and 1920.
- 16 Among others, the company Rheinisch-Westfälisches Elektrizitätswerk (RWE) had gradually extended its high-voltage network over large areas, from Westphalia in the north, via the industrial region of Rheinland to Baden and Württemberg in the south. The RWE network connected a whole series of generating stations and supplied power both through local distribution systems and directly to industrial plants.
- 17 Already by the turn of the century, voltages as high as 100 kV had been deployed in the USA, and before the start of WW1, transmission networks operating at 150 kV had been built.
- 18 Especially during the early period of electricity usage, power consumption had shown a tendency to vary a great deal over the 24 hours. This was especially the case with domestic consumption, which tended to be very high in the mornings and in late afternoon/ evening, but low the rest of the time. This was of course natural, since the current was used mainly for lights and for cooking. Because the dimensions of generating stations had to be adjusted to the maximal demand, it meant that, for long periods, station capability was only partly used. Links to a larger system made more efficient deployment possible. One option was coordination between producers supplying populations with different consumption patterns: for instance, households could be supplied in combination with output going to industries with high daytime, and maybe also night-time, consumption. It goes without saying that the more extensive the transmission system, the wider and more favourable would be the range of power customers.
- 19 It is worth pointing out that commercial as well as technological factors drove the extension of networks to cover whole regions. This was particularly true of the USA, where the electricity provision was mainly managed by private enterprise, and where regionalisation went together with concentration of ownership in fewer hands. Regional companies were buying up local stations on a grand scale, especially from around 1910. At the same time, vertical integration inside the power corporations gave them monopoly positions. For a thorough analysis of the process, see Hausman, Hertner and Wilkins (2008).
- while the water levels in Norwegian rivers are at their highest in spring and early summer, electricity demand peaks in winter, then as now. By organising collaboration between stations powered by river flow and by stored water, the profitability of the joint operation is increased at the same time as supply unpredictability is reduced. This is how it can be done: while the river station runs at full capacity during periods with high flow-rates, i.e., in spring and summer, and at that time meets most of the demand, the station relying on water storage can cut back or stop production, and maximise its water resources. On the other hand, when natural water levels are low, the storage-based station generates the main part of the output and thus compensates for the lower flow to the river station.
- For an account of the construction of the power station at Nore and the Tunhøvd dam, see Thue (1994). Concerning the transmission from Nore, see Skjold and Thue (2007, Chapter 8).
- 22 Additional professional staff was found in various positions in the Ministry of Works, the Elektrisitetskommisjon (Electricity Commission) and the Vassdragskommisjon (Watercourse Commission). The two first instances have already been mentioned. The Vassdragskommisjon was set up in 1909 and given responsibility for investigations into cases of waterfall acquisition, regulation of watercourses and subscriptions on power supplies. However, there were in addition also official commissions appointed in the years leading up to 1920: Vannfallskommisjonen (Waterfall Commission) in 1911, and

- Elektrisitetsforsyningskommisjonen (Electricity Supply Commission) in 1919. See Thue (2006), p. 104 et seq. Also Vogt (1971), p. 72 et seq.
- 23 Not unexpectedly, these different roles were reflected in the Board's substructure. But its mixed responsibilities were to prove fertile ground for recurring criticisms. An institution with both administrative and commercial functions was not likely to be completely trusted. However, NVE held on to both aspects of its work until 1986, when the state-owned power stations and transmission networks were reorganised into the national enterprise Statkraft.
- 24 Hughes (1983), p. 285.

- For many local authorities, there was, in addition to the large investments, another serious problem: the projects were often poorly funded, and poorly planned in technical terms. This matter was much debated in the sector during the years around 1920. See Sandberg (1951), p. 316 et seq.
- 2 During this decade, the total installed capacity increased from 1200 MW to 1800 MW.
- 3 In Østlandet, only two stations larger than 15 MW were constructed during the 1920s: Skjerka power station in Vest-Agder, which started up in 1932, and Grønvollfoss power station in Telemark, on stream in the following year. Skjerka and Grønvollfoss had capabilities of respectively 35 and 22 MW. Away from Østlandet, the city of Bergen in the west (Vestlandet) built the Dale power station as a joint project with the rural county council. Dale had a capability of 59 MW and started up in 1928. The city of Narvik constructed the Trædal station (34 MW), which started up in 1932. Also, one industrial station of more than 15 MW capacity was constructed: Saudefaldene (44 MW), on stream in 1931.
- 4 Such trade associations included among others the so-called "bulb club", formed by Norwegian electric bulb manufacturers and established at the start of the 1920s.
- 5 The market orientation of the electricity stations is thoroughly described in Johannessen (1992), Chapter 4, and in Skjold (2001), Chapter 4.
- 6 In fact, around 1920, a debate took place in the staff organisation NEVF concerning how far the generating companies should move towards a social service ideal. Some argued that the companies should concentrate on their purely commercial concerns. However, this view was not widely accepted. See Sandberg (1951), p. 316.
- 7 For an overview, see Brochmann (1935).
- 8 Johannenssen, op cit. and Skjold, op.cit.
- 9 Statistisk sentralbyrå, Tillegg til statistiske meddelelser nr 11 (1925). [National Statistics Authority, Supplement to statistical information, no. 11 (1925)]
- 10 Ibid.
- 11 The four companies which entered into this agreement were: Oslo elektrisitetsverk [Electricity Company], Vestfold kraftselskap [Power Company], Skiensfjorden kommunale kraftselskap [Local Authority Power Company] og Buskerud elektrisitetsforsyning [Electricity Suppliers]. The three first-named companies were also producers on a major scale.
- 12 Skjold and Thue (2007), Chapter 1.
- 13 Ibid, Chapter 2.
- 14 Ibid.
- 15 Thue (1994), p. 226.
- 16 Lack of power affected the counties of Hedmark and Oppland in particular.
- 17 St. meld. [Storting proposal] nr. 38 (1936): "On the matter of the sale of Nore power station".

- 18 As late as 1946, the MD, Olaf Rogstad, together with senior directors of NVE, expressed explicit doubts about the state taking on the construction of a power station at Aura (Møre og Romsdal). The project was regarded as too large and risky. See Thue (1994), Chapter 10.
- 19 This chapter is based mainly on the account by Skjold (2006).

- 1 Hanisch and Lange (1986), Chapter 1.
- 2 Hughes (1989); note in particular Chapter 6.
- 3 Rinde (1996).
- 4 For a thorough study of the Marshall Plan, see Hogan (1987).
- 5 Scretary of State Arne Drogseth, to the Minister for Industry, Lars Evensen. Quoted from Skjold (2006), p. 29.
- 6 Skjold (2006), Chapter 1. Cf. also Ingulstad (2006).
- 7 Ibid
- 8 The aluminium smelters at Årdal and Sunndalsøra were merged into one company at an early stage.
- 9 Skjold (2006), Chapter 1.
- 10 Foreign companies that started up included Alcan (Canada), Harvey Aluminium (USA) and AIAG (Switzerland).
- 11 The historians Francis Sejersted and Even Lange have discussed respectively the "actively compensatory state" and the "compensatory entrepreneurship" as descriptive terms to characterise the role of the state in industry after 1945. See Sejersted (1993) and Lange (1991).
- 12 Skjold (2006), Chapter 1.
- Note that, during this period, the development of heavy industry in Norway illustrates an important general observation: the cost of essential elements is not a sufficient factor to attract new industry. Norwegian power was the cheapest in Europe, but there also had to be good institutional relationships to tempt entrepreneurs.
- 14 For the full set of figures, see Storting report no. 47 (1947).
- 15 The total funding for the decades from 1950 to 1990 is 2.3 billion NOK and of this sum, more than three-quarters went to Nord-Norge (the north) and Vestlandet (the west). A generous 40% was paid out to the counties of Nordland, Troms and Finnmark in the north, and 27% to the four counties Rogaland, Hordaland, Sogn and Fjordane and Møre og Romsdal in in the west. A thorough examination of the State Aid Fund is reported in Hindrum (1991).
- 16 Hindrum (1991).
- 17 Since the 1996, the Trondheim-based institution is known as a part of *Norges teknisk-natur-vitenskapelige universitet* (NTNU) Norwegian University of Technology and the Natural Sciences.
- 18 Skjold (2006), Chapter 3.

- 1 Thue and Rinde (2001), p. 179.
- 2 Det Norske Arbeiderparti [Norwegian Labour Party], *Elektrisitetssaken* [*The Electricity Issue*], Oslo 1949.
- 3 See Rinde (2001), Chapter 9, and Skjold og Thue (2007), Chapter 4.

- 4 The causes and implications of this retreat have been subjects of considerable debate between Norwegian historians and social scientists. For an important contribution, see Nordby (1993).
- 5 Innst. S. nr 185 1962–63.
- The NVE made statements of this kind in many contexts. This is an example from an investigation carried out in 1966: "At this time, the electricity companies must have strong financial resources, as well as appropriately structured technical and commercial organisation in order to respond effectively to current developments in the economy and the demands they make on power production, assured delivery and realistic energy prices. Large enterprises are able to meet such demands." See NVE, *Elektrisitetsforsyningen i Norge* [*The Supply of Electricity in Norway*], appendix to St. meld. [Submission to the Storting] no. 19 (1966–67).
- 7 The so-called State Aid Fund (see Chapter 4) provided the funding. Local authorities and electricity companies, which received state aid to increase their electricity provision, were obliged, for one thing, to merge into larger units at the request of the state. However, this rule was not applied to any great extent in the 1950s, even though there were a large number of grant recipients during this period.
- 8 Originally, only rural communities were part of the county level provision. This changed in 1964 when the towns also joined. The choice of the county as the primary organisational level was also influenced by the general strengthening in the 60s of this tier of government.
- 9 A centre-right government had in fact taken over in 1963, but it only lasted a few weeks.
- 10 NVE, Board meeting on 23 March, 1967. Elektrisitetsdirektoratet [Central Electricity Board], Item 2.
- If we for instance take 1971 as an example, we find that electricity was supplied in Vest-Agder county at prices which were among the lowest charged anywhere in Norway. The supplier was a vertically integrated county company. In Nord-Trøndelag County, consumers on the other hand paid relatively high prices, although here, too, the supplier was the dominant county company. The variations between counties with small-scale providers were correspondingly great. In Telemark County the average unit price was comparatively low, while in Møre og Romsdal County it was among the highest. Both counties were supplied by a large number of small units. See NVE, *Vår virksomhet* [*Our Enterprise*]: Table 5 (1972).
- 12 We should certainly interpret the statistics with caution. Several factors affect electricity company costs and far from all can be directly linked to the organisational structure. Other factors are the degree of financial assets, the access to favourable power sources on one hand, and the need to buy in power on the other, available state funding, etc.
- 13 In the 50s and 60s, structural rationalisation preoccupied the Swedish authorities. Here, too, it proved impossible to show any consistent relationship between company size and energy unit costs. This is interesting, because the gathering of empirical evidence was more thorough than in Norway. Careful analyses were carried out on several occasions during these two decades. But, as the largest and most thorough of the investigations concluded in 1968, it was "hard to prove that a small area of distribution was in itself as less recommendable than a large area." See SOU (1968): 39, p. 62. The study actually showed that the very smallest companies, with fewer than 200 subscribers, charged the lowest energy unit prices in Sweden. The reason was thought to be that company structures tended to be cooperative and that they were based on natural assets.
- 14 See Skjold and Thue (2007), Chapter 4.
- 15 Ibid.
- 16 Sejersted (1993).

- Head of construction Per Tønder Smith, quote from Nilsen and Thue (2006), p. 69.
- 2 Large waterfalls like the Vøringsfoss, Skjeggedalsfoss and Tyssestrengen had been put forward for protection as early the end of the 19th century.
- 3 Nilsen and Thue (2006), Chapter 2.
- 4 The core member of this alliance was Naturvernforbundet (Society for Nature Conservation), an old organisation concentrating on "classical nature conservation", i.e. protecting waterfalls and tourist attractions, but which under new leadership had undergone major changes. Its membership had increased massively during the 1960s. The Society engaged itself strongly in the Eidfjord project and, among other actions, managed to join up and mobilise a wide range of concerned groups. See Nilsen and Thue (2006), Chapter 2.
- This development required that the Mardalsfoss, the tallest vertical fall in northern Europe and a famous tourist goal, was to be diverted. In this case, unlike that of Eidfjord, there was also strong local opposition to the construction. The reason was that Statskraftverkene wanted to divert the Mardøla waters to the neighbouring valley and build the power station there. The original host community would not earn any substantial income from the project. For many local people the whole thing looked like a state robbery of their assets.
- 6 Storting papers: prp. No. 4 (1972–73).
- 7 The exceptions were Sjoa with Gjende, Trysilvassdraget with Femund and Kinso/Opsjå in Hardangervidda.
- 8 Thue (1996), p. 74 et seq.
- 9 NVE Vår virksomhet 1973, Oslo (1974), p. 4 [Annual Report 1973].
- 10 Ibid.
- 11 IFA was set up in 1948 as an institution for pure research. The institute ran its own research reactor in Halden, the only nuclear reactor that has ever existed in Norway.
- 12 Dahl (1998).
- 13 Ibid.
- 14 NVE, Vår virksomhet 1973: p. 73 [Annual Report 1973].
- 15 Anselm (2000).
- 16 Nilsen og Thue (2006), p. 119.
- 17 Hveding's resignation triggered an extensive public debate about the relationships between politicians and specialist civil servants, which illustrated the declining status of the experts in many parts of society. An interview with the Oslo Professor of Philosophy, Arne Næss, in connection with the resignation was significant in this context. The headline was "Technicians dangerous as bureaucrats. Vidkunn Hveding the lad who likes playing with his knowledge?" *Dagbladet* (8th March 1975).
- 18 Hveding in the newspaper *Verdens Gang*, 26th February 1975.
- 19 NVE, Vår virksomhet 1978, p. 4 [Annual Report 1978].
- 20 Samkjøringen av kraftverkene i Norge, Årsberetning 1979, p. 76. [Coordination of Norway's power stations. Annual report 1979].
- This applies for instance to Ulla-Førre, which came on stream in 1982. The project included among others, the Kvilldal power station, which had a capability of 1270 MW the largest ever built in Norway.
- 22 Nilsen and Thue (2006), p. 193 et seq.

- 1 See Nilsen and Thue (2006). The quote is cited on page 236.
- 2 Thue (2005), chapter 1.
- 3 Gullowsen and Ryggvik (2004).
- 4 Knutsen and Boge (2005).
- The historian Yngve Nilsen has claimed that, at the beginning of the 80s, NVE was "one of the most attacked and suspect of [state] enterprises". He argues that NVE's dual role was a particular source of suspicion, given that as both regulator and producer its brief was to regulate, not only other operators of power stations, but also its own. It would appear that Nilsen's evaluation is based above all on the opinion of the environmental movement. In the wider public debate, the tone was considerably less partisan. Unpublished manuscript, Nilsen (2006).
- 6 Gullowsen and Ryggvik (2004).
- 7 Thue (2005).
- 8 This argument was especially dominant in the 1950s and 60s, but was also put forward in the 70s.
- 9 As stated in interviews with employees at Statskraftverkene/ Statkraft, carried out as part of the project *State Power* [*Statens kraft*].
- 10 The comments by Skjold distinguish between development and production. The production side was actually small, as hydroelectric stations required exceptionally few people in place to run them. Skjold (2006), especially Chapter 3.
- 11 The construction sector had set up its own rationalisation unit as early as by the end of the 1940s. This unit was greatly expanded in parallel with the construction programme. The activity of the rationalisation unit had without doubt a major effect on how businesses were organised. Skjold (2006), especially Chapter 2.
- 12 The annual amount granted to Statskraftverkene actually rose markedly between 1980–85, from 1.5 to 2.5 billion Norwegian kroner.
- 13 Knutsen and Boge (2005), p. 302 et seq.
- 14 Gullowsen and Ryggvik (2004).
- 15 Thue (2005).
- 16 Espeli (2005).
- 17 During the second half of the 1970s, the Norwegian authorities stuck to a wide-ranging reflation policy, which ran counter to the internationally low economic activity during this period. The money pumped into the economy came mainly from the Oil Fund, and led to the specifically Norwegian phenomenon of growth in incomes and prices.
- 18 The American economist and historian Christopher McKenna has recently discussed the consultant as an agent for change, and how surprisingly undervalued this role has been. In his book *The World's Newest Profession. Management Consulting in the Twentieth Century* (CUP, 2006), McKenna shows how, for one thing, American management consultants were critically important in exporting American managerial ideas to the European marketplace during the 60s and 70s. That these ideas became so widespread is probably due both to general fascination for American models, and to the fact that European heads of businesses wanted such models. In the reorientation process, McKenna puts greater emphasis on the "sales side", i.e., on the way, from the late 50s onwards, that large management consultancy firms made energetic and successful forays into the advisory market in Europe. These US consultancies evidently played a noteworthy role as advisors on the agreements required in

order to free up and commercialise previously state-controlled activities. This trend took off in many European countries in the 70s and grew stronger from then on. Besides, it seems certain that the ethos, which fundamentally drove this process of change, was very much in line with what we might call the American model. The scepticism against state ownership and political influence on private enterprise has always been more dominant in the USA than in most of the European countries. Public ownership is also consistently less common in the USA than in Europe. This last point is discussed in, for instance Galambos (2000).

- 19 The report is entitled Organisation of a more independent enterprise to manage state construction.
- 20 Report by the consultancy firm Harmark-Iras. Cited by Nilsen (2006), p. 233.
- 21 At an early stage, some large industries in Norway had taken an interest in the divisional model from the USA. Norsk Hydro is one case in point: as early as in the beginning of the 60s, it had sent members of staff to the USA to study it in practice, and afterwards reorganised quite swiftly in line with the model. Johannessen, Rønning and Sandvik (2005), p. 281 et seq.
- 22 The "divisionalised" enterprise was an American invention, although it had been widely accepted in Europe during the 1960s. Management consultants had played a central role in facilitating the transfer across the Atlantic. As discussed above, from the early 60s onwards, management consultants contributed significantly to the European spread of American ideas about leadership and organisation: specifically, principles with a wide uptake concerned decentralisation and divisionalisation. The consultants had contributed to the geographical dispersion of these concepts. Now they seemed actually keen to transfer these private enterprise ideas to the state sector.
- 23 Cf. for instance the departmental statement no. 54 (1979–80): *Norway's future energy needs and energy production*, p. 188 et seq.
- 24 NOU 1982:18.
- 25 The 1979 energy report stated that: "Separation will... tear apart the good professional relationships and the co-operation which have become established between Statskraftverkene and the other sections in NVE." St. meld. no. 54 (1979–80), p. 189.
- 26 NOU 1982:18, p. 52.
- 27 St. prp. no. 57 (1984–85), Appendix 1. The comments are included here.
- 28 The Hovedstyret had five members, all elected by the Storting and often parliamentarians themselves. The Director General was also an ex officio member.
- 29 St. prp. no. 57 (1984-85), p. 40 et seq.
- 30 Himle (1988), p. 38.
- 31 Quoted from Thue and Nilsen (2006), p. 239.
- 32 For example, the representative of Arbeiderpartiet (lit. transl. the Workers' Party) had joined the majority group in the NVE committee under discussion; the majority was against separation.
- 33 Quoted from Thue and Nilsen (2006), p. 239.
- 34 Yngve Nilsen, in his discussion of the process of separation between NVE and Stats-kraftverkene, describes Hartmark-Iras as linked to the international, including American, management consultancy sector. In fact, Nilsen does not provide any deeper understanding of, or more definite information about these links. However, starting with the example of Hartmark-Iras he goes on to ask an interesting general question: to what extent might the development and activity of the consultancy sector help to explain why, just at this point in time i.e., from the end of the 1970s the wave of separatist ideology grows so powerful over such a wide front. Thue and Nilsen (2006), Chapter 6.

- 1 Hope, Ruud and Singh (1993).
- 2 Jabobsen (1998).
- 3 Olsen (2000); Thue (2001).
- 4 Thue (2001).
- 5 Because power station construction was to such a large extent self-financed i.e., not dependent on borrowing the so-called estimated interest was used when capital costs were calculated. The estimated interest was a speculative figure, used in official investment projects to establish their levels of profitability.
- 6 It's true to say that the concept "social economic profitability" was not quite as precise and unambiguous as many economists prefer to argue. As Leif Johansen, one of Norway's leading social economists, with a high international reputation, put it in his 1977 book on this subject: "A comparative reading of the literature gives grounds for stating that the concept of social economic profitability has not got an unequivocal status or meaning in most technical writing." According to Johansen, the whole idea "had in the first place arrived as part of the politically oriented economic debate and of popular, or semi-popular reports." See Johansen (1977), p. 59.
- 7 It is important to state clearly that the economists didn't suggest that the prices should immediately be adjusted in line with the long-term marginal cost price policy. That would have led to declining consumption and hence pile-ups of unsold power. The point was to put a stop to further construction for a while, so that prices could gradually reach the right level in parallel with consumption and the price index generally. In other words, the long-term marginal cost price policy wasn't primarily a criterion for investing, nor a benchmark for pricing.
- 8 Accounts of the growth of the SAF team, its development and professional aims are found in Olsen (2000), especially Chapter 9. See also Thue (2001).
- 9 See, for example, Hope (1983).
- 10 The work was carried out under the leadership of the Energy Legislation Committee, which presented a proposal for a draft Bill in 1985. NOU 1985:9 "Energilovgivningen" [Energy legislation].
- 11 Olsen (2000).
- For this process, see Jakobsen (1998), Olsen (2000) and Thue (2001).
- 13 Jacobsen (1998).
- 14 Bjørndalen, Hope and Tennbakk (1989).
- 15 Ot. prp. no. 43 1989–90.
- 16 It is true that the draft Bill stated that larger units could bring advantages of scale. But at the same time it emphasised that the county company model was undesirable, because it didn't allow a clear distinction to be made between the two conflicting parts: the monopolistic and the competitive. Horizontal integration, with formal separation between power production and the grid was the ideal. See Ot. prp. no. 43 1989–90.
- 17 It was argued that if companies were to produce power for the market, as well as owning distribution networks, they would be able to charge a higher price for providing a monopoly service the customer has no other option than the one network and a lower price for the power, i.e., pricing at a level lower than its competitors.
- 18 A system for supervising companies with networks was set up in order to ensure that they were running the distribution as efficiently as possible. It was not a given that they would

- be optimally efficient, since this activity was not subject to competitive pressures. NVE was chosen as the supervisory body.
- 19 Bjørndalen, Hope and Tennbakk (1989).
- The state-owned company pointed out that charging a freestanding enterprise with managing the national grid would be taking a risk: it could become a "very expensive monopoly organisation". This argument was however not taken all that seriously. Even though Statkraft was not, on the whole, a monopoly, the company had in fact a near-monopolistic control of the national grid. Besides, why should an independent grid company be more expensive than Statkraft? Another argument that did not stand up concerned the significance of coordinating the control of the grid with the productive side of the state involvement in the sector. It was right to point to the critical importance of such coordination in earlier years, i.e., from the 50s onwards, when state construction of power stations on one hand, and transmission lines on the other, were practically two sides of the same coin and especially so in the smaller regional authorities (see Chapter 5). But, by the early 90s, many observers considered the national grid essentially complete. Or, at least, there was no need for Statkraft to construct new transmission lines every time a new power station was built.
- 21 Besides, this view wasn't unique to the right-wing government. When the Arbeiderparti was returned to power in the autumn of 1990, Statkraft lobbied to have the decision to split the company overturned. However, despite strong support from the company's own staff, the central office of the trade union movement and several employers' organisations, the new Minister for Oil and Energy, the Arbeiderparti man Finn Kristensen, stuck with the existing legislation.
- 22 Managing Director Odd Håkon Hoelsæter moved from his previous position as chairman of the Coordinating Board. The Deputy MD, Oddmund Larsen, also had long experience of the same organisation.
- 23 *Elbørsen* 1993–1998 [*The Power Exchange* 1993–1998], 1998, Nord Pool. A copy of this publication is available at the website http://www.nordpool.com/asa/
- 24 Statnett Marked, Annual Report 1994.
- There is solid documentary evidence for the statement that Norway was a model for its Scandinavian neighbours. See Skjold and Thue (2007), Chapter 11.
- 26 In a 1990 report from the Ministry for Oil and Energy the point was made as follows: "The reorganisation of the Norwegian energy market will serve as an incentive to development of an inter-Nordic marketplace, too. [...] Should a joint Nordic marketplace for power be set up, it will increase the value of the whole Nordic power sector and also be in line with the work to create an internal EU power market and the principles on which it is based. See Statkraft. Fremtidige oppgaver, organisasjon og bemanning [Statkraft, Its Future Tasks, Organisation and Staff Requirements], a report from a working party within the Ministry for Oil and Energy, published in June 1990. The quote is taken from page 72.
- 27 Svenska Kraftnät [Swedish National Grid] was formed in 1992 and given responsibility for the management of the Swedish system of core transmission lines – a responsibility previous undertaken by Vattenfall. In other words, Sweden created an independent grid operator in good time before the market reform.
- 28 Odd Håkon Hoelsæter, in the Preface to 5th anniversary publication. Nord Pool (1998). Also on the website. http://www.nordpool.com
- 29 There were countries, including the USA, which already in the 1970s had in fact introduced legislation which with certain reservations required owners of central transmission lines to make their networks available to third parties. In such case, the issue had nothing to do

- with organising markets. See *Independent System Operators in the USA: History, Lessons Learned, and Prospects* by Richard O'Neill, et al. (2005).
- 30 France, where EdF continues to be the national monopoly, is an extreme case. Other countries with problems of this kind include Canada, where provincial companies have practically held monopoly positions at every stage, from production to end-user, as for instance in two of the most populous states, Quebec and Ontario. This has proved an obstacle to market liberalisation for a long time. For examples, see Dunsky and Raphals (1998).

- 1 Statkraft, Annual Report (1993), p. 28.
- 2 An average of approximately 90 percent of the total turnover was generated through such long-term bilateral contracts.
- 3 The majority of these companies also had their own power generating stations. The power was typically sold on to the electricity companies owned by the same local authority.
- 4 Initially, only the larger power consumers were able to pick and chose their preferred supplier. After the introduction of the market reform, it took a couple of years for households to get the same right.
- 5 However, it wasn't the case that longstanding links between power suppliers and consumers ceased immediately after the introduction of the market reform. For example, it was quite common to regard it as disloyal if a local electricity company turned its back on "its own" power producer, especially if this had adverse financial consequences for the producer. For a discussion of this point, see e.g., Midttun (1993).
- 6 Gradually, the set price became subject to splitting up into even shorter periods of time.
- 7 In fact, the contracts market wasn't operational until 1993. At start-up it was possible to enter into contracts for up to a year at a time, but this limit was expanded at an early stage. With time, the market also allowed for "futures" trading, i.e. trading in existing contracts.
- 8 Later, it became possible to extend the contractual period even further.
- 9 The problems associated with risk assessments are clarified for instance in Amundsen and Bjørndalen (1994), Bjørndalen (2004) and Olsen (2000).
- 10 Statkraft, Annual Report (1992).
- 11 The company stated that its goal was to "increase the proportion of fixed contract sales of its power", as the Statkraft annual report stated in 1994.
- 12 Personal communication, Jan-Kåre Johnsen, 25th September 2008.
- 13 Ibid.
- "As a consequence, Statkraft became much less exposed to low spot prices," as the annual report stated in 1993 (p. 4). The proportion of Statkraft's spot market sales fell considerably between 1992 and 1994; in 1992, 1993 and 1994 its share of the trade was respectively 45, 39 and 28 percent.
- 15 It was especially useful that Norway had such a good supply of electricity, because it is expensive to extend a thermal power system to a new top load capacity. Here, in other words, was a large potential market for export by Norwegian producers to thermal systems during period of maximum load, i.e., during daytime. In addition, there were "traditional" advantages of coordination, which benefited both parties. In exchange for deliveries of daytime power, the Norwegian hydropower companies could import from the thermal generators during the night and thus save up stored water for periods of greater demand. Sales of

- night-time power suited the thermal operators, because their generating stations run most efficiently when the load is kept at an relatively high and unchanging level.
- 16 Both agreements were for 600 MW. The plan was to lay undersea cables from Norway to Germany and The Netherlands. However, during the first few years, the agreement with Preussen Elektra specified deliveries via the cable from Norway to Denmark, and then on by landlines to Germany, using the Danish ELSAM's grid. Until 2001, which was the year of completion for the new cable linking Norway directly to Germany, the upper limit of the power transmission was 400 MW.
- 17 This was an older agreement between the authorities in Denmark and Norway.
- 18 The long contract run-times were due in particular to two considerations. One was the importance of making sure that the new cables would pay their way. Another, according to Statkraft, was the likelihood that long-term contracts would cause its partners in the deal to invest less in new generating capacity at home, which in turn would tend to improve the price paid for Norwegian power. A lot of discussion focused on how the output of a hydroelectric station can be increased cheaply relative to a thermal station. Improved or larger turbines were all a water-powered station needed. By contrast, to increase the output of a thermal station was much more complex. On the whole, Statkraft regarded export of top-up power as a potentially attractive area of investment for Norwegian power producers.
- "Entering into power exchange agreements with foreign countries will become one of the areas in which Statkraft makes investments," according to the company's annual report in 1993. For a discussion of Statkraft's visions of export opportunities, see also Thue (2006), p. 328f.
- 20 Nilsen and Thue (2006), p 329.
- 21 Personal communication, Jan-Kåre Johnsen, 25th September 2008.
- 22 At the beginning of 1996, CEO Lars Uno Thulin had for instance this to say with regard to the future challenges to his company: "One [challenge] is to balance the contracts portfolio between long- and short-term contracts." When he mentioned short-term contracts, he was referring to agreements settled in the contracts market of Statnett Marked. See Statkraft, Annual Report (1995), p. 35.
- 23 Statkraft, Annual Report (1994), p. 39.
- 24 Statkraft, Annual Report (1995), p. 38.
- 25 Annual Report (2000), p. 20 et seq.
- 26 Also, the Norwegian tax on generating stations, although it is high for instance compared to Sweden, serves to even out variations in profits, because it is linked to the market price. In other words, low prices means that the tax payments are reduced. Other no less useful regulations include the reduction of transmission charges when production falls, another factor which damps down fluctuations in income.
- 27 Annual Report (2000), p. 20 et seq.
- 28 The Kyoto protocols, which introduced charges on CO₂ emissions, were ratified in February 2005 and will come into force in 2008. However, the EU introduced fines for exceeding certain limits already in 2005.

- 1 Storting proposal. [= St. prp.] no. 53 (2003–2004), p. 20.
- 2 Storting document. [= St. meld.] no. 22 (2001–2002) A Smaller and Better Form of State Ownership, p. 125.
- 3 Statkraft. Future Tasks, Organisation and Staffing. Report by a working party set up by the Oil and Energy Department in June 1990. The group was led by the departmental undersecretary Per Håkon Høisveen and the members were otherwise mainly drawn from Høisveen's own staff, the Finance Ministry and Statkraft.
- 4 Storting proposal. no. 104 (1990–91). Only the Fremskrittsparti (Progress Party) voted against. The party insisted that it would entail a clear case of subsidy for heavy industry. To consult the record of the debate in the Storting, see Storting Records, 8th November (1991).
- 5 See Storting proposal no. 100 (1990–91). State-owned limited companies can also be subject to political directives. One example is the state telecommunications company Telenor, which had to deliver basic phone line services to the entire country. Again, the national broadcasting company Norsk Rikskringkasting (NRK), which like Telenor was structured as a state-owned limited company, was told to offer broadcasting on a nationwide scale. However, the political directives in such cases tended to concern generalised, overarching demands, mainly stated in terms of directives and conditional concessions. Flexible management options, i.e., for ongoing political involvement, were very limited.
- 6 See Royal Command, 24 August 1990. The international perspective was also to the fore in the brief for the committee tasked with evaluating and developing new organisational structures for state enterprises. The committee was asked, among other things, "to evaluate a possible adjustment of the law on state enterprises to the EEC regulations in this area". Cf. NOU 1991: 8. Law on state enterprises, p. 7.
- 7 E.g., System changes: Statkraft SF 1992–2002, Statkraft 2002, p. 12.
- 8 A state enterprise (SF) was permitted to borrow in its own name, though the sum and collaterals were capped at a value that must not exceed the value of the company assets. The regulations for some companies could curtail the borrowing rights still further. These rules should be seen in the context of the state being liable for the company's financial obligations in the last instance.
- The Law on State Enterprises established, among other things, that the board and the directors are under an obligation to consult the relevant department of state, the acting owner, in matters "concerning anything of substantial importance to the aims of the company, or which will substantially change the nature of the business transacted."
- 10 Storting proposal no. 52 (1998–1999). Concerning Statkraft's Industrial Contacts and Leasing Agreements.
- 11 These contracts were signed in the main during three intensive periods: the late 1950s, the 60s and the mid-70s. In 1998, the contracts from the 50s were set at an actual price of about 0.05 NOK per kWh, in contracts from the 60s at about 0.06-0.07 NOK, and in those signed in 1976, at about 0.12 NOK. The prices quoted in the new contracts should in principle be set at the market level and then adjusted according to the agreed advantages that industrial customers enjoyed. The factories were often located close to the power stations. As a rule, they handled any transforming to lower voltages themselves and were large customers with a steady annual consumption, which also commanded a lower price.
- 12 The government stressed how "important it is to build on the goodwill built up by local industry to sustain and further develop economic life in the provinces". It was also admitted

- that out in the local authority areas "the challenges posed by reorganisation" were most deeply felt. See Storting document no. 29 (1998–1999), p. 11.
- 13 In 1998, Statkraft also entered into extensive commercial agreements with, among others, Norsk Hydro and Norske skogindustrier [Norwegian Forest Industries].
- 14 Innst. S. no. 233 1998–99, p. 3.
- During the treatment of the proposal to the Storting, the Arbeiderparti backed, among other clauses, the demand that in new contracts, the government should insist on proof of efficient energy-use and obligatory arrangement for energy capture and re-use. See Innst. S. no. 233 1998–99, p. 3f.
- 16 The letter is included in the Storting proposal no. 78 (1999–2000) *Statkraft: Changes in Conditions for Agreements Concerning Delivery and Leasing*, Appendix 1.
- 17 Ibid.
- 18 Basis for Collaboration in Government between the Arbeiderparti, Sosialistisk Venstreparti and Senterparti 2005–2009 ("Soria Moria Declaration"), p. 20.
- 19 The group included Thorstein Bye, the head of the research department at the Statistisk Sentralbyrå (Office for National Statistics), Lars Sørgard from Konkurransetilsyn (Competition Commission) and Henrik Bull, legal expert specialising in EU laws. The group concluded that there was "a whole array of problems linked to the creation of a separate market for industrial power and also little reason for believing that it would function according to the original intentions. Expert opinion does not consider a market for industrial power a viable option." Quoted from Thue 2006, p. 361.
- 20 Over the last few years, the authorities have looked into the possibility of offering cheaper power to heavy industry on the basis of special conditions in the contracts. Suggested examples included an obligation to invest in energy-saving measures and to husband power during shortages. However, ESA has not approved of any such ideas. For further notes, see e.g., Storting budget proposal no. 1 (2004–2005) from the Oil and Energy Department.
- 21 NRK (Nowegian Broadcasting Company), Dagsrevyen (Daily Review), 10 September (2008).
- 22 The *Law of State Enterprises* contained a clause which established that, if a state-owned enterprise were to be closed down, the state guaranteed all its debts and other financial obligations. See *Law...*, 30 August 1991, no 71, *Concerning State Enterprises* etc. §§ 4, 51 and 53.
- 23 At the time, the rule concerning state guarantees was not intended to give state enterprises an advantage against the competition. The fundamental idea was that such enterprises had socially important functions, which could not necessarily be defended in terms of business efficiency. This was anyway a matter of principle: when the state undertook certain tasks, it naturally also accepted final financial responsibility for their completion.
- 24 The Department of Labour and Administration, responsible for handling the question, was unconvinced that enterprises such as Statkraft actually gained anything from the guarantee clause. The department felt that a realistic examination of a sample of loan terms and conditions for selected businesses would prove the point. The government's attitude also didn't seem entirely consistent. Not much later, it made reference to changes in the law on state enterprises, due to the fact that as the proposal says "state enterprises are able to raise loans on more favourable terms than other ventures;" see Storting proposal no. 53 (2003–2004), p. 9. The guarantee clause was removed, as demanded by ESA. The first time round, the government declared that it would meet any existing undertakings, i.e., set out in agreements entered into before the change in the law. This triggered a new ESA complaint, which led to all previous obligations being cancelled, with the exception of ordinary loans with

legally binding contracts. Instead, the state enterprises were to pay the state a premium on the guaranteed loan, intended to compensate for any possible advantages of having a state-backed loan. For a discussion of this matter, see Ot. proposals no. 13 (2002–2003) *Concerning Changes in the Law* 30 August (1991); no. 71 *Concerning State Enterprises*, etc. Also, Innst. O. no. 45 (2002–2003). Statkraft itself had actually raised the issue of the advantages of the state guarantee several years earlier. In 1994, when the company decided to ask for a credit evaluation from an international firm (Moody's), it was given the top rating. It was in this context that Statkraft declared that: "The high rating is based on the indirect state guarantee to Statkraft in its capacity as a state enterprise, as well as on our company's strong market presence and satisfactory financial position." The statement added: "The high rating confirms Statkraft's profile as a first-rate recipient of loans and gives the company good access to the capital market, internationally as well as in Norway." See Annual Report (1994) p. 7.

- 25 This was announced in the Storting document no. 22 (2001–2002) *A Smaller and Better Form of State Ownership*, p. 125.
- 26 Ibid.
- 27 Compare with the Bondevik II government's political platform, the so-called "Sem declaration". Here, it has been quoted as stated in St. meld. no. 22 (2001–2002). The Sem declaration established, for instance, that the government thought it desirable to evaluate state ownership in companies without clear political goals.
- 28 On the contrary, the Arbeiderparti had taken the initiative to reorganise several large firms as limited companies. For instance, during the first Stoltenberg regime (2000-01), the party had agreed to part-privatise the state telecommunications company Telenor.
- 29 The title of the document A Smaller and Better Form of State Ownership expresses the guiding ideas. The government's goal, according to the document, was to "bring about a strengthening of private enterprise in Norway and that the extensive state ownership is reduced." Later (p. 5), the document also states: "It is the attitude of the government that private ownership of business ventures is most likely to lead to commercial gains and that it should therefore be supported." These convictions were drawn from, among other sources, a book published in 2001 entitled The Problem of Wealth. Oil Assets, Ownership and Future Pensions [Rikdommens problem. Oljeformue, eierskap og fremtidens pensjoner] and edited by the social economists Kjell Roland, Torger Reve and Viktor Norman. Later that year, Viktor Norman was appointed to a ministerial post in the Bondevik government. In the document on ownership, his co-edited book is cited (on page 22) as part of the argument against state ownership.
- 30 Innst. S. no. 248 (2003-2004), p. 4.
- 31 Ibid.
- 32 As it is put in the document: "Revenue considerations also indicate that [...] is it advantageous to the state that Statkraft continues to be registered, located and directed from Norway." St. meld. no. 22 (2001–2002), p. 125.
- 33 Ibid.
- 34 Cf. Innst. S. no. 248 (2003-2004).
- 35 St. meld. no. 13 (2006-2007).
- 36 Ibid, p. 102.
- 37 See (among other sources) the article under the headline *Ready for gigantic state sale. State companies worth hundreds of billions on market*, in the newspaper *Aftenposten*, 8 August 2008.
- 38 Thue (2006), p. 302.

- Statkraft, *Growth with pure energy*, In *Strategic Platform* 2009–2011, p. 1.
- 40 "AS is strongly welcomed" was the statement by Bård Mikkelsen in a lecture at the Nordic Energy Summit, 24 August, 2004.
- 41 This judgement is based on, among other sources, personal communication with CEO Bård Mikkelsen on the 25th September 2008, and on the 29th September with Jørgen Kildahl.
- 42 Statkraft, Annual report (2000), p. 1. It stated that the government "now proposes that, in the years to come, the dividend is to be set at 50%, even though this is large in comparison with other companies."
- 43 Personal communication with CEO Bård Mikkelsen on the 25th September, 2008.
- 44 St. meld. no. 61 (1996-97) Concerning Ownership in Business, p. 7.

- St. meld. no. 61 (1996–97). *Concerning Ownership in the Economy*, p. 6.
- 2 For instance, between 1999–2000 Statkraft and Vattenfall crossed swords about the owner-ship of the local electricity station Larvik and Lardal Energiverk. Statkraft, about to consolidate its interest in the region, regarded Vattenfall's advance as a threat against its expansion strategy. See Skjold 2001, p. 209 et seq.
- The company's financial problems were primarily due to the expensive construction programme, shared with Statkraft, in Finnmark County during the 80s and to the company being landed with large amounts of power after the market reform. Statkraft had traditionally had a strong position in Nord-Norge and the takeover of the Finnmark electricity company strengthened its dominance in the northernmost region. Before the purchase of Finnmark Energi AS, Statkraft generated over 46% of the total production from the so-called region 4, which consisted of the counties of Finnmark and Troms, and also the northern part of Nordland. After the acquisition, its share of the regional output came close to 53%.
- 4 The purchases increased Statkraft's ownership holdings in the Østlandet and Sørlandet and its share of total output from 7 to 20 TWh. In Midt-Norge the holdings grew from 45% to 55%. In Nord-Norge its share was somewhat smaller, but not much. It was only in the Vestlandet region where Statkraft did not have as strong a position.
- For this process, see Kongeleg resolusjon [Royal resolution] 23.11.2005: Omstøyting av vedtak etter konkurranselova. Statkraft Holding AS sitt erverv av Trondheim Energiverk AS [Invalidation of the resolution of the law of competition: Statkraft Holding's acquisition of Trondheim Energiverk].
- The arguments backing this statement are actually extremely complex. The authority indicated several ways in which a big operator like Statkraft could manipulate the market, as for instance by cutting back production in order to put pressure on the unit price. A region afflicted by a "bottleneck situation" of course cannot compensate for the cutback by trading with outside producers to get round the local price increases. Taking this route could also drive the expectation that the market price might rise later on. A large operator could anyway introduce bottlenecks through production cut-backs and in such situations the need for power from other producers would go up. If the reduction were to be big enough, the transmission lines might fail to carry the full power requirement. The induced bottleneck would isolate the region, which would then become a separate pricing area. In generally high demand, this could provide greater profits for the operators inside the area.

- During the years from 1998 to 2001, Midt-Norge and Nord-Norge experienced separate pricing areas for respectively around 23, 37, 42 and 24% of the year. The statistics for Sør-Norge in the corresponding years were 23, 33, 55 and 8.9%
- 8 See Hjalmarsson (2000), Johnsen et al. (1999) and Steen (2003). A recent review of research can be found in Solberg (2008).
- 9 Bård Mikkelsen, speaking in connection with Statkraft's interim statement of results for 2002, presented on 6th March 2003. Text on http://www.statkraft.no/pro/pressesenter/ pressemeldinger/2003/894354.asp
- 10 Ibid.
- Statkraft claimed in its complaint against the Competition Board that the authority greatly exaggerated any wish to manipulate the market after transmission bottlenecks. The core motive for the indicated behaviour would be based on expectations of future prices. The notion that water would be held in storage for future production was risky, the company insisted, since the outcome might just as well be a fall as a rise in profits. Besides, Statkraft argued that in a system like the Norwegian, i.e. dominated by hydropower, it was extremely difficult to make distinctions between manipulation and normal market practice. A hydropower generating station could legitimately be run to maximise profits. It was expected of the management and actually the basis for the entire market system. The way to do it was to adjust production so that output was maximal, when the prices were high. To bring this about, Statkraft felt, could "... hardly be regarded as anything other than optimal for the business and for the social economy."
- 12 Among other comments, this was said in the ministry's decision with respect to the complaint from Statkraft: "The acquisition of Trondheim Energiverk meant that Statkraft now controlled 60% of the storage capacity in the area and the result was to give the company greater options for exerting power in the marketplace. The likely outcome will be higher prices for electrical power in Midt- and Nord-Norge." The text is published on: http://www.regjeringen.no/nb/dokumentarkiv/Regjeringen-Bondevik-II/aad/234519/248921/statskraft_holding_as_oppkjop_av.html?id=250202
- 3 Go to the government's website for the text of the decision by the Competition Board and the subsequent exchanges between the authority, the ministry and Statkraft.
- 14 Innst. S. no. 289 (2002-2003), p. 2.
- 15 Innst. O. no. 109 (2002-2003).
- 16 Ibid
- 17 Royal decree on 23 November 2005.
- 18 The decision included a direct statement concerning the obligations of Statnett with respect to the problems of bottlenecks: "It is the duty of Statnett to invest in the transmission grid in response to criteria set by the public economy. Among its other tasks, Statnett is expected to prevent any obstructive or lasting bottlenecks in the system." The government also indicated the trouble the bottlenecks had caused Statkraft.
- 19 During this year, consumption in Norway was approximately normal, i.e., around 112 TWh, while production barely reached 103 TWh. The shortage was met through a net import of about 9 TWh. This was the first time since the introduction of the power market reform that Norway had had to become a net importer. Also, the net amount imported was larger than any net amount exported in any one year during the same period.
- 20 Statkraft, Annual Report 1997.
- 21 The committee stated in its final report that it had been established "in response to the experiences gained in the dry year of 1996, a decision which is best understood in the context

- of the ever tighter margins between supply of and demand for power." NOU 1998: 11 *Energy resources and the power balance up to 2020*, p. 4.
- 22 NOU 1998: 11 Energy resources and the power balance up to 2020.
- 23 St. meld. no 22 (1998–99) *Concerning the Energy Policy*. It stated, for instance: "The government aims to maintain the safety of the system for delivery of power, both in order to cope with peak demand and to have a good basis for managing the supply during years with significant lows in waterpower generation due to low precipitation levels."
- 24 In the same document (p. 3): "The production framework means that this government has to give active support to a policy of limiting the use of energy and reduce dependence on electricity as a source of heat. The required changes will take time. Energy consumption must be limited so that it is much less than indicated by current trends alone." Also, the government committed itself to "stimulate the use of renewable energy sources through an extensive R&D programme."
- 25 NOU 1998: 11. Energy resources and the power balance up to 2020, p. 52.
- 26 St.meld. no. 29 (1998-99), p. 8.
- 27 The first two had received permits in 1989, the third one in 1990. The permit period was later extended.
- 28 The Sauda watercourse had a power potential of around 2 TWh, of which only half had been developed. The application for develop the remaining falls was submitted in 1998. The plan was to start building in 2001.
- 29 Jens Stoltenberg, statement to Stavanger Aftenblad 15th September 1994. Cited in Nilsen (2001), p. 177.
- 30 See Innst. S. no 250 (1995-96).
- 31 It concerned the so-called "green taxation commission." See NOU 1996:9.
- 32 http://www.arbeiderpartiet.no/Aktuelt/Nyhetsarkiv/Klima-miljoe-og-energi/Vil-sette-press-paa-Naturkraft
- 33 St. meld. no 29 (1998–99) *Concerning the Energy Policy*, p. 22.
- 34 Ibid. The document, among other comments, suggests an investment grant of 25%, exemption from investment charges and a reduction by half of the electricity charge.
- 35 St. meld no. 37 (2000-2001), p. 5.
- 36 As stated in the company's Annual Report for 1996: "There are draft plans for increased production capacity and the expected growth in consumption must be met."
- 37 In its extensive report from 1998, the Energy Committee for instance pointed out that "as electricity consumption continues to grow and the expansion of inland production capacity is limited, during years to come Norway will increasingly become dependent on power imports." See NOU 1998:11, p. 5.
- 38 St. meld. no. 37 (2000–2001), Concerning Waterpower and the Energy Balance, p. 2.
- 39 Ibid, p. 5.
- 40 St.meld. no. 18 (2003–2004) Concerning the Security of Energy Supplies, Electricity etc., p. 10. In the words of this document: "Over time, the Nordic power market has become more vulnerable to fluctuations in rain and snowfall. This is a consequence of the relative imbalance between an increase in production capacity that has been much slower than the rise in consumption by households, businesses and public services."
- 41 Ibid, p. 7 et seq.
- 42 See for instance RWE, *Factbook. Generation capacity in Europe 2007*. This publication is also available at this web address: https://www.rwe.com/web/cms/mediablob/de/108844/data/10439/de-Factbook-juni-2007-2.pdf

- 43 See for instance the UCTE report System Adequacy Forecast 2006–2015 (2005).
- 44 Statkraft, Annual Report 1992.
- 45 St. meld. no. 29 (1998-99), p. 76.
- 46 St. meld. no. 29 (1998–99), p. 3.

- 1 Statkraft press release, 24.07. 2008.
- ² "Our strategy is that Statkraft shall be a leading Northern European energy corporation with outstanding expertise in hydro-electric power," according to CEO Lars Uno Thulin in 1993. See Statkraft, Annual Peport 1992, p. 21.
- 3 Hausman, Hertner and Wilkins (2007), Chapter 7.
- 4 Ibid, Chapter 7, Note 1.
- Veba and Viag were both conglomerates, but their largest component companies were respectively PreussenElektra and Bayernwerk.
- In 1988, the Spanish state sold off shares to keep a 75% holding. In the same year, the company was registered on the New York stock exchange. In 1954, the state sold off more equity, now down to barely 67%.
- 7 Statkraft, Annual Report 1992, p. 21.
- 8 Statkraft, Strategic Plan. Cited in Thue and Nilsen (2006).
- 9 Midttun (2001), Table II.1.
- 10 Ibid.
- The shareholdings in Sydkraft were bought in two lots. Statkraft began with the shares held by three local authorities (in Malmö, Oscarshamn and Landskrona). Later the same year, it bought shares from EdF and some more on the stock exchange and from other international owners.
- 12 Statkraft, Annual Report 1996, p. 53.
- 13 Bjurling (1981), p. 212 et seq.
- 14 E.g., the Senterparti and Sosialistisk Venstreparti.
- 15 Nilsen and Thue (1981), p. 338.
- 16 In 2001, the leadership discussed a merger with Sydkraft. The next year, merger negotiations were underway with the Finnish company Fortum, which also owned nuclear reactors.
- 17 Statkraft, Growth with pure energy. Strategic Plan 2009-2011.
- 18 The German hydropower stations together had an output of 262 MW, while the two gasfired stations Robert Frank and Emden Gas produced respectively 487 and 430 MW.
- 19 In fact, 0.05% was still owned by a minor group of small shareholders.
- 20 Statkraft, Growth with pure energy. Strategic Plan 2009–2011, p. 22.
- 21 The current strategic plan states: "Our generating and market operations in Sweden, Germany and the UK supplement our capacity in Norway and provide a new platform from which to operate."
- 22 Personal communication, Kjell Haagensen, 20.05.2009.
- 23 The arrangement was that Statkraft and the state-owned Swedish company Vattenfall each held half the equity of a company called Nordic Hydropower AB.
- 24 The delivery contract with an indigenous company in Nepal was to run for 25 years. The power from the hydropower station in Laos was, according to a long-term agreement, to be delivered to a state-owned company in neighbouring Thailand.

- 25 Personal communication, Kjell Haagensen, 20.05.2009.
- 26 In the company's annual report for 1998 it was put like this (p. 55): "Until its economy stabilises and comes to enjoy international trust, Statkraft will continue to regard investment opportunities in Indonesia with caution."
- 27 Statkraft, Annual Report 1998, p. 55.
- 28 The partner in the collaboration was Pacific Hydro Limited, a company especially engaged in development of renewable power generation in Asia, Australia and Latin America.
- 29 Statkraft, Annual Report 1997, p. 53.
- 30 Norfund was set up in 1997 with the primary objectives of "collaborate by providing venture capital, loans and guarantees to promote sustainable enterprises in developing economies" and also to support the creating of "viable and profitable businesses, which otherwise might not have a future due to perceived high-risk elements." (Ot. prp. no. 13 (1996–97), §1). In the main, Norfund was to support by providing capital injections during the most risky period after a business has been set up, and later sell off its holding to co-investors or on the stock market
- 31 Among other proposals in the national budget (State prp. no 1 (2001–2002), it is stated that "NORFUND shall build up its support for further investments in the energy sector."
- 32 SN Power, Annual Report 2003.
- 33 According to the Annual Report for 2003: "The Peruvian and Chilean investments provide an important foothold in our core markets in Latin America, and an excellent base for further growth in the region."
- 34 Norfund received sales options for its remaining shares in 2010, 2013, 2014 and 2015. The prices, and hence Statkraft's financial commitment to Norfund, was to be based on independent evaluations at the relevant point in time. Before the end of 2010, Norfund is also allowed to sell on shares to investors other than Statkraft, up to half its holding (20%) and under condition that the firms are not Statkraft's international competitors.
- 35 The ongoing debate about globalisation is characterised by sharp opposing views of its advantages and drawbacks, but at the same time also by a kind of consensus that the process is inescapable. This has however been criticised by both economists and economic historians, who recall earlier periods in which growing economic internationalisation has met with severe setbacks. See e.g. O'Rourke and Williamson (1999).
- 36 See Hausman, Hertner and Wilkins (2007).

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Page 174: The picture shows Managing Director Lars Uno Thulin handing over a bottle of glacier water from Svartisen to Minister Finn Kristensen, at the opening of Svartisen power plants in 1993.