7: The electricity market

The power sector in Norway is regulated by the Energy Act. Market-based power trading is one of the principles incorporated in this statute. Similar legislation is found in Sweden, Denmark, Finland and the other EU countries. The Nordic countries today form a common electricity market, which also is interconnected with Russia, Germany, the Netherlands, Estonia and Poland.

7.1. How the electricity market functions

All generating companies supply electricity to the transmission grid. Once delivery has been made, it is no longer possible to separate supplies from different producers. When a consumer turns on the electricity, it is impossible to say where the power was generated.

When electricity is transmitted, some energy is lost. This loss depends on such factors as consumption and transmission distance. At any given time, the amount of electricity supplied to the grid is equal to the amount tapped from it, corrected for transmission loss. Accounts are kept of how much each producer is delivering to the grid at any given time and how much each consumer uses.

If a consumer changes power supplier, this will not in itself affect the physical flow of electricity in the network. The transmission tariff paid by the customer is therefore unchanged. See Chapter 6. It makes no difference whether the customer buys electricity from a power supplier on the west coast or in the far north of Norway. The consumer merely concludes a new contract with a supplier which may specify different prices and terms.

The amount of electricity a producer sells directly to customers at any time need not correspond to its production. To maximise income, producers manage the use of water in the reservoirs on the basis of the spot price at any given time and expectations about what it will be in the future. See Section 7.2 on power trading. To ensure that power production corresponds to sales commitments, producers can buy and sell power in the market, Nord Pool, for instance, which is the Nordic power exchange.

The Nord Pool Group comprises both a marketplace for physical power contracts (Nord Pool Spot AS) and a marketplace for purely financial contracts (Nord Pool ASA). The latter company also includes the wholly owned subsidiaries Nord Pool Clearing and Nord Pool Consulting. See Section 7.2.1.

The market price for power varies, reflecting changes in consumption, generation and transmission conditions in the Nordic power market. Variations in precipitation and temperature can result in large swings in the spot price. This means that the financial risk associated with electricity trading is high.

To reduce this risk, producers, consumers and other players in the market can enter into long-term contracts. Households can obtain fixed-price contracts, for example. Producers (and large-scale consumers) can either enter into bilateral agreements or trade in financial long-term contracts through Nord Pool.

7.2. Power trading

It is only the large players in the power market that trade directly on the power exchange, Nord Pool, or through bilateral power contracts. These players include power producers and suppliers, traders, brokers, large industrial enterprises and other large undertakings.

The transaction costs associated with this kind of trading make it unprofitable for smaller consumers. With regard to physical power contracts, about 70 per cent of the electricity consumption in the Nordic countries is traded through Nord Pool Spot AS (per 2007). The remainder is traded bilaterally. Although a growing proportion of contracts in the financial market are traded through Nord Pool ASA, bilateral contracts still have the largest share of this market.

Households and other minor consumer categories ordinarily have electricity agreements with power suppliers in the end user market. The end user market is discussed in more detail in Section 7.2.4.

7.2.1 Nord Pool – the Nordic power exchange

The Nord Pool Group – the Nordic power exchange – engages in trading and clearing of physical and financial power contracts in the Nordic region. About 420 players currently

trade on one or more of Nord Pool's markets. The Nord Pool Group comprises Nord Pool ASA, Nord Pool Spot AS and affiliated companies.

The financial marketplace Nord Pool ASA is owned 50–50 by the transmission system operators (TSOs) in Norway (Statnett SF) and Sweden (Affärsverket Svenska Kraftnät). Nord Pool Clearing ASA and Nord Pool Consulting AS are wholly owned subsidiaries of Nord Pool ASA. In 2007, a decision was reached to sell large portions of Nord Pool ASA's operations to The Nasdaq OMX Group, which currently operates the stock exchanges in Finland, Sweden and Denmark etc. This transaction was carried out in October 2008.

Nord Pool Spot AS is the marketplace for physical power contracts. On Nord Pool Spot the electricity spot price is set on an hourly basis for Norway, Sweden, Finland and Denmark, and the market also lists prices in Germany. The electricity spot price is a reference price for other power trading. Nord Pool Spot is owned by the TSOs in the Nordic region. The Nord Pool Group's head office is in Lysaker near Oslo, and the company has operations in Stockholm, Helsinki, Fredericia (Denmark), Berlin and Amsterdam.

In 2007 the Nord Pool group had 112 employees, and contracts worth about NOK 735 billion were traded and cleared on the power exchange, including the value of physical trading.

Nord Pool's products are divided into three principal categories: the physical market, the financial market and clearing.

The physical market

Nord Pool Spot AS is the marketplace for physical power contracts.

Elspot, the electricity spot market, is a common Nordic market for trading physical power contracts hour by hour for delivery the following day. Prices are determined on the basis of the balance between bids and offers from all market participants. The spot market price provides the basis for the TSOs when balancing the flow of power between the Nordic countries.

The system price in Elspot serves as a reference for contracts in the financial power market at Nord Pool ASA. This system price reflects the generating and consumption conditions in the region. The area prices take account of possible bottlenecks in the Nordic transmission network, something in which the system price do not. See Section 7.2.2.

Apart from power producers and industrial companies, players in Nord Pool's spot market include distributors, electricity suppliers and power brokers.

Elbas is a physical balancing market (intraday) for trading in Sweden, Finland, Denmark and Germany, with hourly contracts which are traded continuously round the clock. These contracts cover the time span from when the Elspot market for the following day has concluded, and the contracts can be traded up to an hour before the time of delivery. Elbas is administered by Nord Pool Finland. During autumn 2008 the Norwegian Water Resources and Energy Directorate (NVE) will be considering a proposal from the Nordic TSOs (Nordel) about Norwegian participation in the Elbas market starting on 1 January 2009.

As the delivery of physical power is limited by the ability to transmit power via cables or the grid, Nord Pool Spot AS is a monopoly company.

The NVE is responsible for issuing licences for trading on Nord Pool Spot AS. The NVE also has supervisory responsibility for both Nord Pool Spot AS, the market participants with trading licenses and Statnett as the Norwegian TSO. The Ministry of Petroleum

and Energy is responsible for the licence for organising power transmission between Norway and other countries.

The financial market

Nord Pool ASA offers trading in derivative contracts and settlement for market players in the financial market. Financial power trading involves the buying and selling of financial instruments used for risk management and price hedging, without a physical delivery of power taking place. The financial products are often referred to as long-term contracts (duration longer than 24 hours). They can be traded for up to five years into the future, divided by days, weeks, months, quarters or years.

Future contracts are financial contracts that establish rights and obligations between buyer and seller that include both a daily cash settlement during the trading and delivery period and a final cash settlement when the contract period expires. The cash settlement reflects the difference between an agreed price and variations in the reference price on the spot market with regard to an agreed quantity of power during the delivery period.

Forward contracts are financial contracts between a buyer and seller on a predetermined delivery price for an agreed quantity of power with regard to the reference price in the spot market during an agreed delivery period. Forward contracts lock in the price for a particular period of time and are settled during the delivery period. There is no cash settlement during the trading period, but players must be able to furnish a bank guarantee for the accumulated result of price changes during the delivery period.

Contracts for differences (CfD) provide opportunities for members on the exchange to hedge their portfolios in terms of differentials between the system price and the various area prices in Elspot.

Nord Pool's options contracts are European options with forward or future contracts as the underlying product.

In 2004 Nord Pool began spot market trading in Swedish electricity certificates[1]. Nord Pool also has a licence to offer forward trading in electricity certificates.

As the first exchange in the world, Nord Pool has been trading carbon emissions allowances since 2005. From the opening until the end of the year 2005, 27.95 million tonnes of CO_2 were traded and cleared over Nord Pool (13.21 tonnes on the exchange and 14.74 on the over-the-counter market). By the end of the year, 64 players from 11 countries had become members.

Nord Pool ASA is an enterprise subject to competition. It is The Financial Supervisory Authority of Norway (Kredittilsynet) which oversees the financial market for power and that is responsible for Nord Pool ASA's licence to operate the derivatives exchange. Kredittilsynet is subordinated to the Norwegian Ministry of Finance.

Clearing

Nord Pool Clearing AS provides settlement and clearing services for financial contracts, both for the contracts that are traded on Nord Pool ASA and a large proportion of the contracts traded bilaterally.

Nord Pool Clearing acts as central counterparty for the transaction vis-à-vis the initial buyer and seller. Nord Pool Clearing acts as counterparty in all trades and guarantees correct settlement of all the financial contracts. This reduces the market players' counterparty risk and is a key contributor to the efficiency of the Nordic power market.

1 Trade in electricity certificates for renewable energy is intended to encourage increased generation of electricity from renewable energy sources, such as wind, conventional and next-generation hydropower and biofuels.

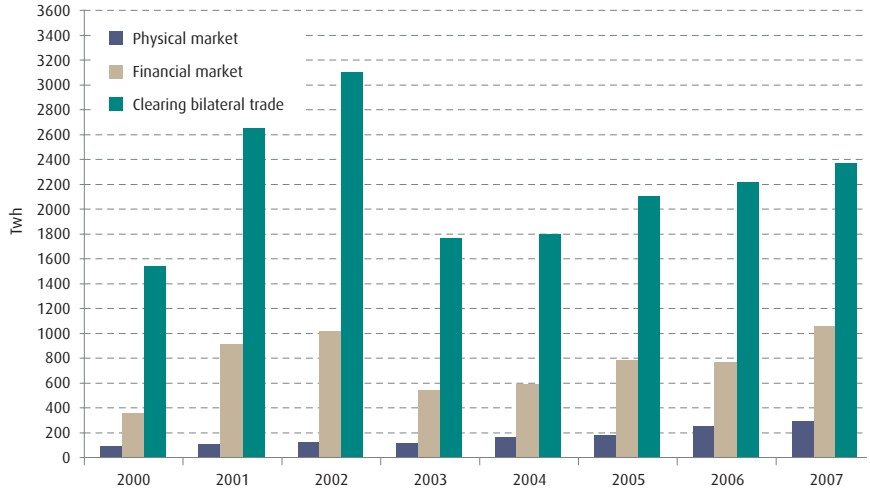

Figure 7.1 Trading on Nord Pool 2000–2007.
Source: Nord Pool

Clearing, too, is an activity subject to competition. Kredittilsynet, under the Ministry of Finance, oversees clearing activities and is responsible for Nord Pool Clearing ASA's licence to operate a clearinghouse.

Nord Pool's turnover in 2007

Traded volume in the physical market increased from 2006 to 2007 by 16 per cent. Traded volumes totalled 251 and 291 TWh in 2006 and 2007, respectively. On account of lower power prices in 2007 than in 2006, the value of traded volume in the physical market fell by around 22 per cent from 2006 to 2007. The value of traded volume in 2006 was nearly NOK 99 billion, while the value in 2007 was nearly NOK 77 billion.

From 2006 to 2007 the traded volume in the financial market increased by around 38 per cent. Traded volumes for 2006 and 2007 were 766 and 1,060 TWh, respectively. The value of traded volume in the financial market rose from NOK 291 billion in 2006 to NOK 348 billion in 2007.

Clearing of bilateral trades totalled 1309 TWh in 2007, a decrease measured in volume of around 10 per cent from 2006. Total volume cleared, both of bilateral trades and financial market, amounted to 2,200 and 2,369 TWh in 2006 and 2007, respectively. In 2007, contracts worth NOK 735 billion were traded and cleared on Nord Pool, including the physical market.

Figure 7.1 shows the performance of the physical and financial market, as well as clearing, since 2000.

7.2.2 Managing bottlenecks in the grid

Nord Pool Spot sets a system price for each hour which takes no account of any transmission restrictions in the Nordic grid. However, such restrictions may arise between geographical areas.

Restrictions in the Nordic transmission grid, often termed bottlenecks or congestions, are managed by specifying price areas on either side of the bottleneck. Nord Pool determines such price areas in addition to the system price. Regions with a power surplus have an area price lower than the system price. The position is reversed in areas with a deficit. Area prices help to balance supply and demand within each area while taking account of the bottleneck.

Norway uses price areas as the main tool for dealing with bottlenecks within Norway and to manage congestion on the border with Sweden, Denmark (Jutland) and Finland. As a general rule, Norway uses price areas to deal with major or long-lasting bottlenecks in the grid, and counter trade when smaller adjustments are needed. In the event internal congestions in Norway, the market is normally divided into two or three price areas: Southern Norway, Northern Norway and eventually Central Norway. Sweden and Finland use price areas solely to deal with bottlenecks on the borders, and use counter trade to deal with internal bottlenecks. Counter trade involve the TSO paying producers to increase or reduce production in order to balance the market. Denmark is divided into two price areas, Jutland and Zealand.

The difference between area and system prices is called the capacity fee. The capacity component of volume transmitted over bottlenecks is an income for the system operators, called congestion income. The Nordic system operators share the congestion income that arises on the interconnectors between the Nordic countries. Congestion income is included in the system operators' income and therefore contributes to reducing tariffs for users of the network, as specified in Section 6.2.1.

7.2.3 The balancing market

The balancing market (or regulating power market) is a tool which the Norwegian TSO, Statnett SF, uses to maintain a stable frequency and balance between generation and consumption in Norway. See Section 5.4. The balancing market opens after prices and quantities have been determined in the electricity spot market. The market works like this: Statnett receives and is able to utilise bids from major power producers or consumers who are willing to change their production and/or consumption plans at short notice. In this way, Statnett ensures that it can adjust the amount of power in the grid either upward or downward right up until and also in the hour of delivery. This may be necessary, for example, in the event of the sudden failure of a power station or transmission line, or sudden unexpected changes in demand. Statnett exchanges power in the balancing market with the other TSOs in the Nordic countries. A joint Nordic regulation power list was established in 2002. Statnett and Svenska Kraftnät have joint responsibility for balance regulation in the Nordic region. Elbas is also used for short-term regulation of the market in Sweden, Finland and Denmark.

Statnett also concludes contracts for power reserves with producers and major consumers in the balancing options market. These contracts help to make sufficient reserves available in the balancing market so that the balance between generation and consumption can be maintained even when the effect balance is under pressure. The power reserve contracts specify how much capacity each individual player can make available to the regulating power market, which period is included and the price they receive in order to keep the offered capacity available. The minimum volume for an offer is 25 MW, within the specified elspot area in the specified time

period, as described in 7.2.2. The contracts however do no specify the final price the market player receives, as this price is determined in the balancing market, in accordance with the ordinary rules. When Statnett has determined which offers in the capacity options market to accept, all bidders which have made the same type of bid – in other words, within the same grid area and for the same period – receive the same price per MW. This price is equal to the highest price accepted for this type of bid. These contracts were first used in November 2000.

7.2.4 The end user market

Anyone who buys electricity for their own consumption is an end user. Small end users normally buy power from an electricity supply company. Larger end users, such as industrial enterprises, often buy directly in the wholesale market. All end users are free to choose which electricity supplier they wish to use.

An electricity bill has several components: The electricity price, the payment for transmission, the consumption tax (electricity tax), VAT and a levy on the transmission tariff earmarked for the Energy Fund. See Section 2.6.

All end users must pay a transmission tariff to the local grid company to which they are connected. See Section 6.2.2. If transmission and electricity supply are handled by different companies, the end user will normally receive two bills – one from the grid company and one from the electricity supplier. However, most end users buy their power from a company or a group which performs both functions. They usually therefore receive only a single bill on which the transmission tariff and electricity price are itemised separately.

A consumption tax (electricity tax) is levied on power consumed in Norway, irrespective of whether it is produced in the domestic or foreign market. In 2008, the consumption tax was NOK 0.105/kWh and has since 2004 been paid together with the transmission tariff, as described in Section 2.6.

Since 2005, all consumers with an annual consumption of more than 100,000 kWh have been obliged to have hourly metering. In 2007, the NVE announced a full rollout of advanced metering systems (AMS) for all end users. New metering systems will help to bring about better and more correct information about a customer's own electricity consumption, and individual households will no longer need to manually read the meter themselves. New technology will also help to raise awareness of a customer's electricity consumption and give consumers more opportunities in the power market. Certain functional requirements will be set for the AMS equipment installed to ensure that it provides the desired efficiency gains. Recommendations for functional requirements have been drafted by the NVE in close contact with industry and consumer organisations and will be circulated for comments in autumn 2008. Hopefully, new regulations will be approved and implemented during the first half of 2009. According to the NVE, a suitable time horizon for full-scale rollout would be around 2013.

Household customers, as other consumers, can also choose between different types of contracts for the purchase of electricity. The most common contracts for households have prices which vary according to market conditions. As at the fourth quarter of 2007, 49.7 per cent of households had contracts with variable price, which means that power suppliers can change price on a two-weeks notice. Elspot-based contracts, such as ones which charge the Elspot price plus a fixed mark-up, were held by around 40 per cent. The remaining household customers had various types of fixed-price contracts. A fixed

price, for example for one year, means that the power supplier cannot alter the price during the contract period, even if market prices change. As at the fourth quarter 2007, 10.4 per cent of household customers had this type of contract.

Some 28 per cent of household customers, including cabins and holiday homes, had a different electricity supplier than the dominating supplier in their area in the fourth quarter of 2007.

Figure 7.2 shows trends in average prices for households from 1985 to 2007. The electricity price and transmission tariff were separated in 1993. The figure also shows the total end user price including VAT, consumption tax (electricity tax) and Energy Fund tax. Prices for private households were relatively stable from 1985 to 2002. However, the cold winter in 1995–1996, combined with low inflow in 1996, resulted in a sharp rise in wholesale prices which in turn led to an increase in prices charged to households. These accordingly rose from 1996 to 1997. Precipitation was above normal for every year in the 1997–2000 period, with relatively high hydropower output. This was reflected in a general decline in prices over the entire period. Inflow to the reservoirs declined substantially in the autumn of 2002. This resulted in a significant increase in household prices for many at the start of 2003. A more normal reservoir situation yielded falling prices later in the year. At the start of 2004, the levels in Norwegian reservoirs were still 14.8 per cent lower than normal for the time of year, but as

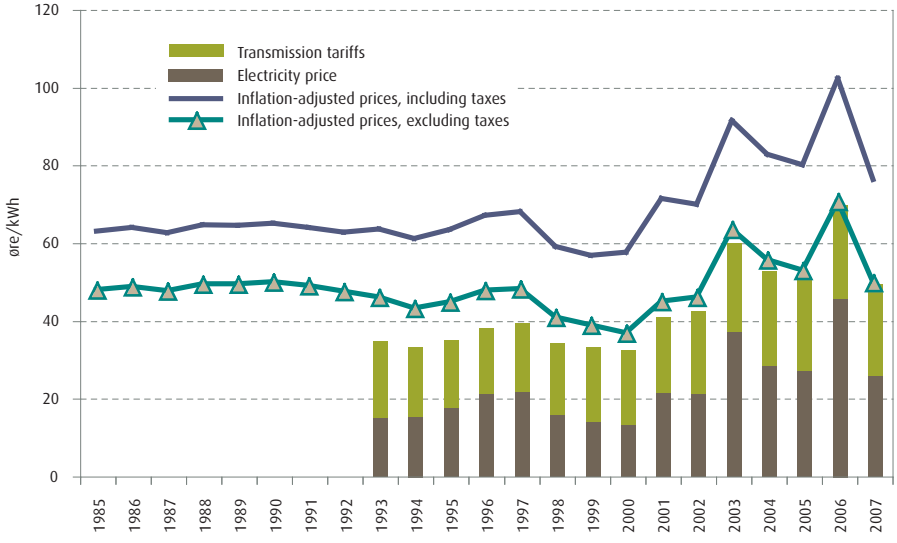

Figure 7.2 Electricity prices for households. Fixed 2007 NOK.
Source: Norwegian Water Resources and Energy Directorate (NVE)

the year wore on, reservoirs returned to a normal level. Household prices remained relatively stable in 2004 and in 2005. Little snow in the winter of 2005–2006 and less precipitation than normal resulted in electricity prices rising in 2006. An improved resource situation in 2007 compared with 2006 led to lower prices that year, about the same level as in 2004–2005.

7.3. Price formation

Norwegian electricity prices are primarily determined by supply and demand in the Nordic power market and by the power balance in countries outside this region. Figure 7.3 provides a simplified outline of how electricity generating costs in the Nordic region influence electricity prices. The rising curve shows the availability of power capacity in the Nordic region as short-term generating costs rise. The falling curve shows the demand for power in the Nordic region. Generating costs are lowest for hydropower and nuclear energy. Precipitation and inflow to reservoirs determine how much hydropower can be generated, and are therefore also important for the overall output potential and for prices.

However, the closer the Nordic market is tied to the the rest of Europe, the more strongly price signals from Europe will affect the Nordic market. Power generation on the continent is dominated by thermal power plants, such as coal- and gas-fired power stations, which have higher production costs. Important factors in this regard are price trends for coal and gas and future prices for CO_2 emission quotas.

Temperatures and weather conditions affect

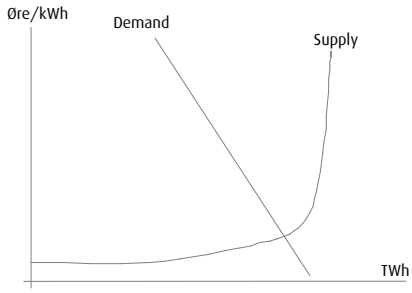

Figure 7.3 Schematic diagram of short-term variable costs of power generation in the Nordic region.
Source: Ministry of Petroleum and Energy

demand in Northern Europe and influence power prices in the short term. Periods of cold weather and high consumption in particular can result in high power prices. In periods of increased demand, power stations with higher generating costs – such as oil condensate or pure gas turbine units – will determine the price. These peak load stations are used only to generate electricity for short periods at a time. In Figure 7.3, they would lie on the steeply rising part of the supply curve.

Figure 7.4 shows variations in nominal electricity spot prices in the period 1993–2007. These prices conceal wide variations from day to day and even within a single 24-hour period. As the figure shows, the spot price for electricity in Norway has been rather stable from the middle of 2003 up to the end of 2005. Electricity prices in 2006 were generally higher than during the previous year, especially in the autumn. Low inflow during the summer contributed to electricity prices exceeding NOK 0.60/kWh in August. As the autumn progressed and into 2007, electricity prices were around NOK 0.25/kWh.

Wet weather and high hydropower production yielded substantially lower electricity prices in 2007 than the previous year. The spot price was very low in the summer of 2007, when it was down to about NOK 0.10/kWh. Subsequently it rose sharply, reaching nearly NOK 0.40/kWh towards the end of the year. This price rise occurred across the entire Northern European power market, and must be viewed as a phase-in of phase two of the European carbon emissions trading scheme. Steadily rising fuel prices, particularly for coal, also contributed to rising electricity prices.

How great this electricity price change is for the individual consumer depends to a large extent on what type of contract the consumer uses. Consumers can chose between contracts with fixed prices and contracts which follow market price changes. Today the majority of Norwegian households have contracts which follow market prices. Furthermore, the power suppliers' procedures linked to the point in time of billing have a certain effect.

7.4. Power exchange with other countries

Norway has traditionally been a net exporter of power. However, Norway has been a net importer in several years since the late 1990s because consumption has continued to rise while hydropower development has been limited in recent times. In certain years, high precipitation and inflow to the reservoirs leads to higher exports than imports. Figure 7.5 shows Norway's imports and exports of power in the period 1970–2007. It shows that there is wide variation in power exchange with other countries from year to year. Net Norwegian power exports in 2002 totalled 9.7 TWh, for instance, while net imports came to 7.8 TWh in the following year. In 2007, Norway was a net

Figure 7.4 System price – Nord Pool's Elspot market 1993–2007

exporter of power by about 10 TWh.

Power exchange with other countries is determined by generating and consumption patterns in each country, in addition to the capacity on the interconnectors between the countries and the conditions for its use. Power trading enables countries to derive mutual benefit from differences in national generating systems.

Exchanging power is important for Norway because it reduces the country's vulnerability to variations in precipitation and inflow and makes use of the regulatory capacity of hydropower. Good opportunities for power exchange moderate the need to maintain a large domestic reserve capacity as an insurance against dry years.

Most of the countries that are interconnected with Norway base their power production largely on thermal energy sources – coal, oil, gas and nuclear. This normally ensures stable energy supplies. The ability to import electricity in dry years provides a reserve for the Norwegian system. In years when water inflow is good, the cross-border transmission capacity makes it possible to export power from Norway. This way, opportunities for power exchange will mitigate price fluctuations in the Norwegian energy supply system. In a closed Norwegian system, electricity prices would be much more sensitive to climatic variations.

Power exchange between Norway and other countries exploits the advantages of interconnecting hydro and thermal power systems. In countries based on thermal sources, power station capacity determines how much electricity can be generated, while the limiting factor in Norway today is the amount of energy available in the form of water in reservoirs. The input used in thermal power countries – coal, oil, natural gas and uranium – can gen-

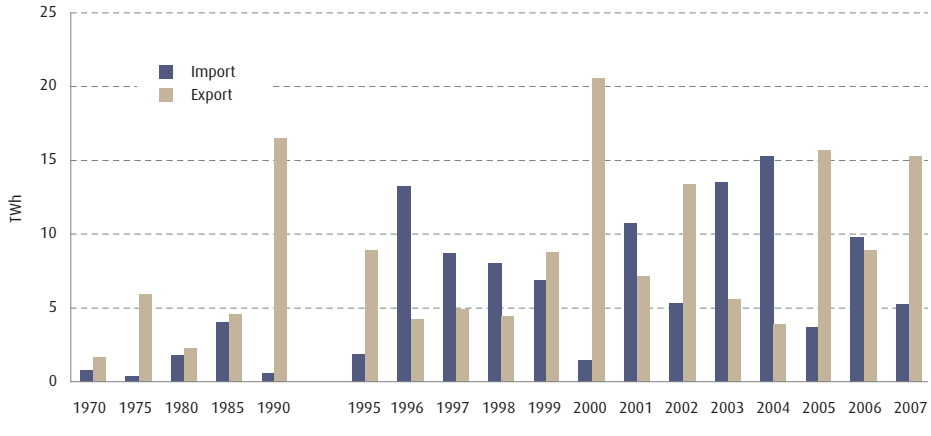

Figure 7.5 Norway's imports and exports of electricity in the period 1970–2007.
Source Ministry of Petroleum and Energy

erally be acquired in whatever quantities needed and accordingly impose no restrictions on the power production.

Building new thermal capacity to meet short-term peak demand in countries with thermal-based systems is expensive, and adjusting production up and down in existing generating facilities is both time-consuming and costly. However, thermal power stations can deliver relatively inexpensive electricity outside peak consumption periods – in other words, at night and weekends.

The capacity in Norway's hydropower stations exceeds the level normally required to meet the domestic demand for daytime consumption. Production from such facilities can be adjusted up and down rapidly and at low cost to meet fluctuations in consumption or unexpected short-term changes in power supplies.

Interconnecting a hydropower-based system with ones based on thermal power also makes it possible to reduce the need for new power stations and multi-annual reservoirs in Norway. When the Norwegian electricity price rises sufficiently above the marginal cost of thermal power output, it becomes profitable for neighbouring countries to export to Norway. Conversely, it is profitable for Norway to export power when the price at home is lower than in the countries it exchanges electricity with.

Norway has transmission capacity towards Sweden, Denmark, Finland, the Netherlands and Russia, as shown on the map in Appendix 4. The interconnections to Finland and Russia is small, and the interconnection with Russia are used only for imports to Norway. The transmission capacity is largest from Norway to Sweden, at about 3,450 MW, while capacity in the other direction is somewhat smaller. Transmission capacity between Norway and Denmark is about 1,000 MW. Statnett and the Dutch TSO, TenneT, have invested in a subsea cable for power exchange between Norway and the Netherlands, which went into operation in May 2008 and has a capacity of 700 MW.

The transmission capacities stated above are the maximum for each interconnector. However, operating and market conditions limit the amount of what can be transmitted at any given time. Estimates indicate that, at full capacity, it would be theoretically possible to exchange almost 20 TWh per year between Norway and neighbouring countries.

Transmission capacity from Sweden to Denmark is normally assumed to be about 2,000 MW, while capacity from Denmark to Sweden is generally about 400 MW higher. The transmission capacity from Sweden to Finland is about 2,100 MW, and around 1,750 MW in the opposite direction. The reason for the difference in transmission capacity in and out of a country is internal factors related to electricity generation, transmission and consumption in each country. Besides the interconnectors mentioned above, the Nordic TSOs plan further Nordic investments to strengthen the grid in the Nordic region.

The map in Appendix 4 also shows the transmission capacity out of the Nordel area, i.e. the capacity between the Nordic regions and neighbouring countries. There are interconnectors to Germany, Estonia, Poland and Russia.

7.5. Electricity production in the Nordic countries

The electricity production in the Nordic countries in 2007 was around 409 TWh. This is an increase of 3.9 per cent for the year. Norway and Sweden are the largest power producers among the Nordic countries.

Hydropower and nuclear energy are the two most important energy sources for Swedish electricity production, and together they account for about 90 per cent of total output. The remainder comes from power production based on bioenergy, gas and coal. The power production in 2007 was around 145 TWh. Almost all available Swedish production capacity based on oil condensate has been closed down in recent years. The Swedish government has decided to shut down nuclear power stations, including capacity at the nuclear power station at Barsebäck. However, new production capacity is also planned. This includes two new gas-fired power stations in Gothenburg and Malmö respectively.

Danish power production is based mainly on fossil fuels, particularly coal as well as some gas. Total output in 2007 was just over 37 TWh. Cogeneration stations, which generate both electricity and heat, account for about 80 per cent of Danish electricity production. Wind power accounted for roughly 19.4 per cent of electricity generated in 2007. Electricity prices to consumers are relatively high in Denmark at present compared with the other Nordic countries, partly because of heavy taxes on consumption.

Finland's power system includes hydropower, nuclear energy and cogeneration. The country generated almost 78 TWh in 2007. Thermal power accounted for around 53 per cent of production, nuclear power 29 per cent, while renewable energy sources such as wind and hydro accounted for 18 per cent. Total Finnish consumption in 2007 was 90 TWh. The bulk of Finland's net power imports come from Russia, with the rest mainly supplied by Sweden – the only Nordic country with significant transmission capacity to Finland.