NordREG
Nordic Energy Regulators

Nordic Market report 2008

Report 3/2008

Nordic Market Report 2008

- DEVELOPMENT IN THE NORDIC ELECTRICITY MARKET

1 Preface

You have at hand the third Nordic Market Report in row prepared by NordREG. The Nordic Market Report has been a steady part of the Nordic regulators work program and a dedicated working group has put their effort to develop the report and put the relevant data together to produce a full picture of the world's best functioning international electricity market.

The report provides a versatile overview of the Nordic electricity market and its development based on data and information available in mid-2008. The areas covered include generation, consumption, transmission, wholesale power market and retail markets.

Within the report a new task is publicly undertaken by NordREG. We have promised to develop a number of statistical indicators to describe and assess the functioning and status of both the wholesale and retail markets. NordREG is working on the indicators and intends to launch a public consultation in autumn this year on the proposal. The next Nordic Market Report will then include as a new chapter the chosen indicators with their measured values.

A working group consisting of representatives of regulators from Denmark, Finland, Norway and Sweden has been responsible for preparing the report. The members of the group were Henrik Gommesen (Energitilsynet, chairperson), Anna Eriksson (Energimarknadsinspektionen), Håkon Mørch Korvald (Norges vassdrags- og energidirektorat) and Petteri Pousi (Energiamarkkinavirasto).

Helsinki, July 2008

Asta Sihvonen-Punkka
Chair of NordREG

2 Summary

The electricity markets in the Nordic region (Denmark, Finland, Norway and Sweden) have been liberalized since the mid 1990s. Following the liberalisation processes began the integration of Nordic markets making the Nordic wholesale market one of the best functioning in Europe.

The Nordic region is characterized by a unique mix of *generation sources* where the high share of hydropower, representing virtually all of the Norwegian and nearly half of the Swedish generation capacity, has a great influence on the market and the amount of electricity generated from various sources. In Finland most of the generation stems from nuclear and thermal plants while generation in Denmark primarily comes from thermal plants.

In 2007 the overall *electricity consumption in the Nordic region* was significantly below consumption in 2006 due to relatively mild temperatures during the wintertime reducing the demand for electricity for heating purposes.

The Nordic transmission grid combines the whole Nordic region to one synchronous power system (excluding western Denmark). Interconnectors also link the Nordic market to Germany, Poland, Estonia and Russia. The combined system has enabled an increased security of supply as well as a more efficient use of the generation capacity – during wet years, hydropower flows southwards and eastwards and during dry years, thermal power flows northwards and westwards.

The Nordic wholesale power market is one of the best functioning electricity markets in Europe. The trade at Nord Pool has increased steadily since it was established in 1993. Although trading at Nord Pool is voluntary, more power is now traded in the power exchange than bilaterally. During 2007 average spot prices at Nord Pool were considerably lower than prices in 2006. The average price for 2007 was even below the average price for 2005.

The Nordic retail markets are essentially four separate markets, influenced by national differences, but work on integration has started. Prerequisites for well-functioning retail markets are active customers who engage in the market. The share of customers switching electricity supplier differs considerably between the Nordic countries; from app. 2 per cent in Denmark to 9 per cent in Norway (household customers).

NordREG is actively involved in helping to establish a common Nordic end-user market for the benefit of the Nordic electricity customers. Standardisation of the procedures and practices on supplier switching and agreeing on a common Nordic balance settlement would facilitate the work towards an integrated Nordic end-user market. Possibility to choose between suppliers from all Nordic countries would most likely increase customer activity and this would further innovation of new products, services and contracts. Increased customer activity would also mean a more competitive market leading to lower margins on the end-user market to the benefit of the consumers.

NordREG has undertaken the assignment to establish *market indicators*, i.e. a number of statistical indicators for the functioning and status of the wholesale and retail markets. The indicators will be developed and sent to public consultation in fall 2008 in order to incorporate them in the market report 2009.

3 Introduction: NordREG

NordREG is a cooperative organisation for Nordic energy regulatory authorities. The mission and common goal of the organisation is to actively promote a legal and institutional framework and conditions necessary for developing the Nordic and European electricity markets.

NordREG mission

In cooperation, we actively promote legal and institutional framework and conditions necessary for developing the Nordic and European electricity markets.

The specific strategic priorities of NordREG are to provide for a well-functioning Nordic wholesale market with competitive prices, be conducive to establish a common Nordic retail market with free choice of supplier, to ensure a reliable supply within the region, and finally, to regulate and monitor the transmission system operators (TSO's) with focus on efficiency and Nordic harmonisation.

NordREG has formulated its vision for the development of the electricity market

NordREG vision for the development of markets

All Nordic electricity customers will enjoy free choice of supplier, efficient and competitive prices and reliable supply through the internal Nordic and European electricity market.

4 Generation and consumption

Hydropower is a major source of electricity generation in the Nordic region. Other sources of electricity generation are thermal power, nuclear power and wind power.

Electricity consumption in the Nordic region is relatively high in comparison with other European countries. This is due to e.g. the influence of cold winters in combination with electricity heated houses and the relative high proportion of energy intensive industries.

4.1 Generation capacity

The Nordic region has a total of 94.313 MW installed capacity for power generation (see table 1 below). More than half of the installed capacity comes from renewable power sources, and hydropower alone – mainly located in Norway and Sweden – accounts for more than half (51 per cent) of the total generation capacity. The large share of hydropower is mainly due to large rivers and significant quantities of precipitation in the mountains, filling the reservoirs during the spring flood.

CHP (Combined Heat and Power) is the second largest generation source accounting for almost 32 per cent of the total Nordic power generation capacity. The majority of the CHP capacity is located in Denmark.

The third largest power source is nuclear power, only located in Sweden and Finland and with a share of 12 per cent of the total Nordic generation capacity.

Wind power accounts only for about 5 per cent, but has increased considerably during the last few years.

Table 1. Nordic Generation capacity (MW) by power source, 2007.
Source: Nordel

	Denmark	Finland	Norway	Sweden	Nordic region
Installed capacity (total)	13 032	16 900	30 313	34 068	94 313
Nuclear power	-	2 651	-	9 074	11 725
Other thermal power	9 899	11 137	890	8 005	29 931
- Condensing power	928	2 988	-	2 298	6 214
- CHP, district heating	7 754	4 051	142	2 883	14 830
- CHP, industry	477	3 293	49	1 224	5 043
- Gas turbines etc.	741	805	699	1 600	3 845
Hydro power	9	3 031	29 043	16 209	48 292
Wind power	3 124	81	380	780	4 365

Vattenfall is the largest generator with a capacity of 15 629 MW, which equates to 16.5 per cent of the Nordic capacity. Statkraft is the second largest generator with a capacity of 11 028 MW amounting for about 11.7 per cent of the total Nordic generation capacity. Fortum has a total capacity of 10 775 MW and 11.4 per cent of the Nordic capacity.

Table 2. Generation capacity by producers, 2007
Source: Regulators and Nordel

	Capacity (MW)	Share
Denmark		
-Dong Energy	6 650	7.1 %
- Vattenfall	2 120	2.2 %
Finland		
-Fortum	5 011	5.3 %
-PVO	3 399	3.6 %
-Helsingin Energia	1 065	1.1 %
Norway		
- Statkraft	11 028	11.7 %
Sweden		
-Vattenfall	13 509	14.3 %
-E.On Sweden	7 252	7.7 %
-Fortum	5 764	6.1 %
Other generators	38 515	40.9 %
Total Nordic region	**94 313**	**100 %**

4.2 Generation

Total power generation in the Nordic region amounted to 392.1 TWh in 2007 – an increase of close to 3.5 per cent compared to 2006.

The development of the total power generation in the Nordic region during 2005-2007 is illustrated below (See figure 1). The development shows the same trends in yearly power generation in all three years.

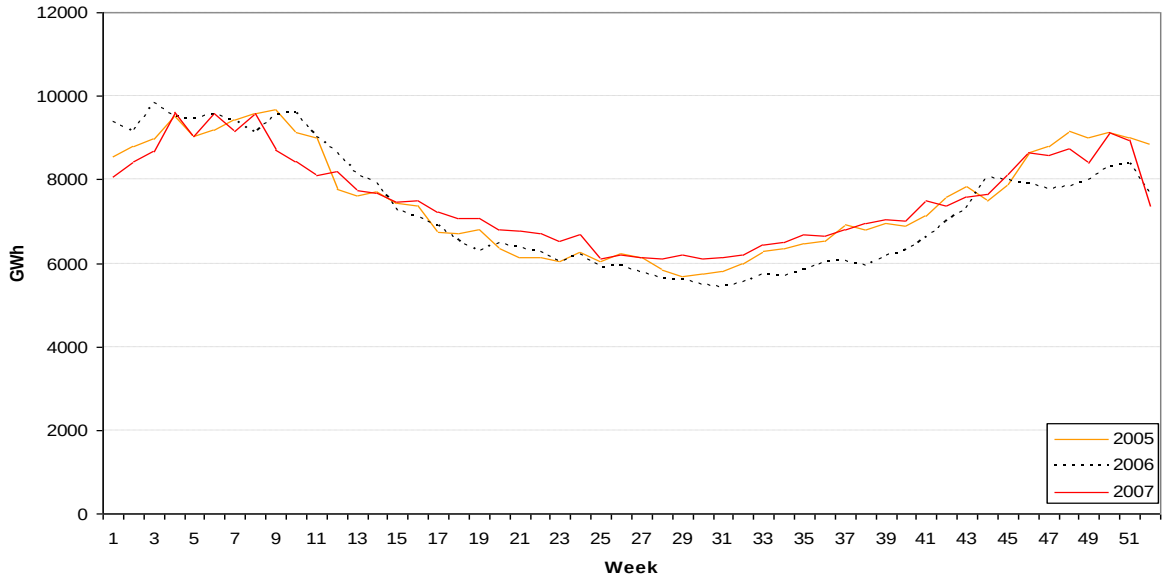

Figure 1. Total power generation in the Nordic region, 2005-2007
Source: Nord Pool

In general, thermal power generation (Finland and Denmark) in the Nordic region acts as a "seasonal-production" determined by the level of hydropower generation in Norway and Sweden. In summer and early autumn 2006 hydro generation was low which caused increased thermal generation to compensate the deficit. From 2007 generation returned to more normal levels. Expansion of wind energy in Sweden and Denmark shows in the higher figures for wind power generation than previous years.

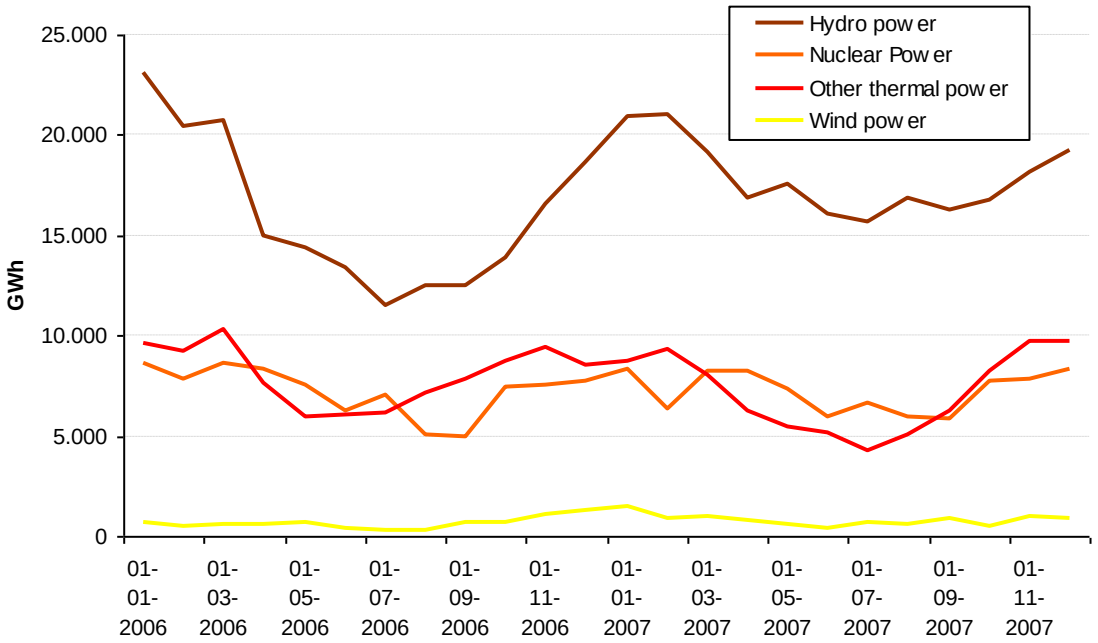

Figure 2. Power generation by power source in the Nordic region, 2006 and 2007
Source: Nordel

4.3 Consumption

The electricity consumption in the Nordic region varies widely due to specific conditions in each country (See figure 3).

Denmark, with relatively warm winters and a small amount of electricity heated houses, has less seasonal variation in electricity consumption than the other Nordic countries. This in addition to a relatively small share of energy intensive industries leads to considerably lower electricity consumption than the other Nordic countries. The Danish electricity consumption has been very stable in the period 1998 – 2007. In 2007, the total electricity consumption in Denmark was 35.8 TWh, which is about the same level as 2006.

Finland has significant seasonal temperature variations and a large amount of electricity heated houses, and hence a much more fluctuating electricity consumption than Denmark. Furthermore, Finland also has a large share of energy intensive industries leading to relatively high electricity consumption. Electricity consumption in Finland has increased steadily. The total electricity consumption in Finland was 90.3 TWh in 2007, which is almost the same level as 2006 (90 TWh).

Norwegian electricity consumption increased steadily from 2004 until mid 2006, when the consumption decreased somewhat. In 2007 electricity consumption increased slightly again. Much like Finland and Sweden, Norway has significant seasonal temperature variations and a large share of electricity heated houses. The share of energy intensive industry is also relatively high and the consumption tied to petroleum activity is increasing. The total electricity consumption in Norway was 126 TWh in 2007, an increase of 2.8 per cent compared to 2006.

Sweden has the highest total electricity consumption of the Nordic countries. Swedish electricity consumption is highly influenced by a large share of energy intensive industries as well as a large share of electricity heated houses. In 2007, the total electricity consumption in Sweden was 144.4 TWh, a small decrease of 1.4 per cent compared with 2006.

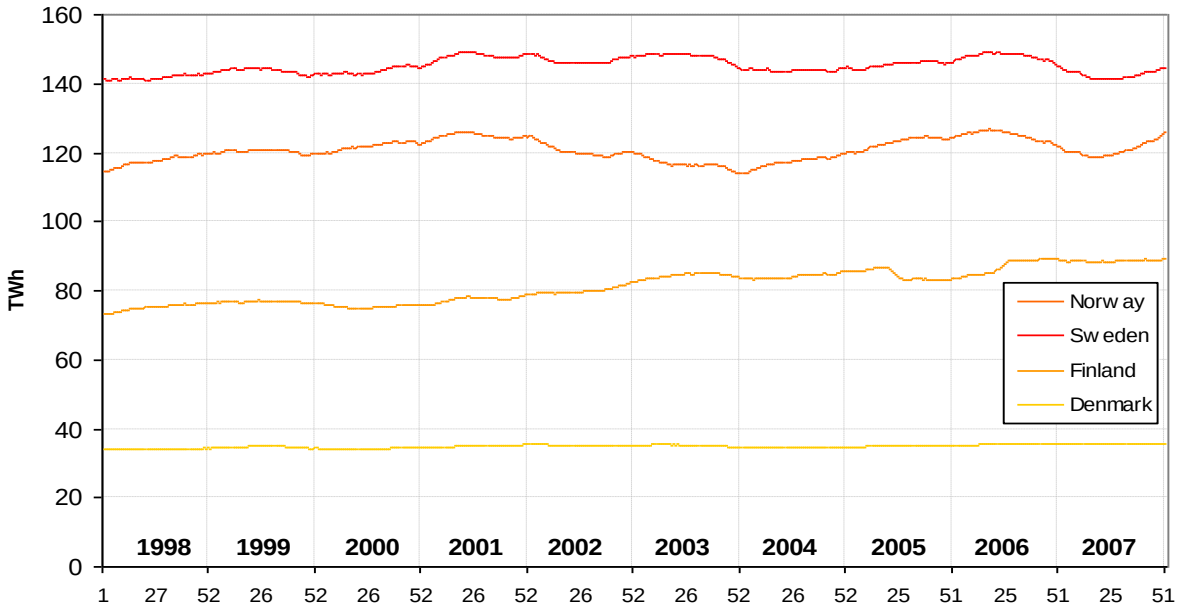

Figure 3. Electricity consumption in the Nordic countries (previous 52 weeks), 1998-2007
Source: Nord Pool Spot

Total electricity consumption in the Nordic region has increased steadily during the last ten years, see figure 4. However, during the second half of 2006 and the beginning of 2007 consumption decreased significantly before consumption began to increase again during 2007. The total electricity consumption in 2007 was 395.3 TWh, an increase of 5.2 TWh or 1.3 per cent compared to 2006.

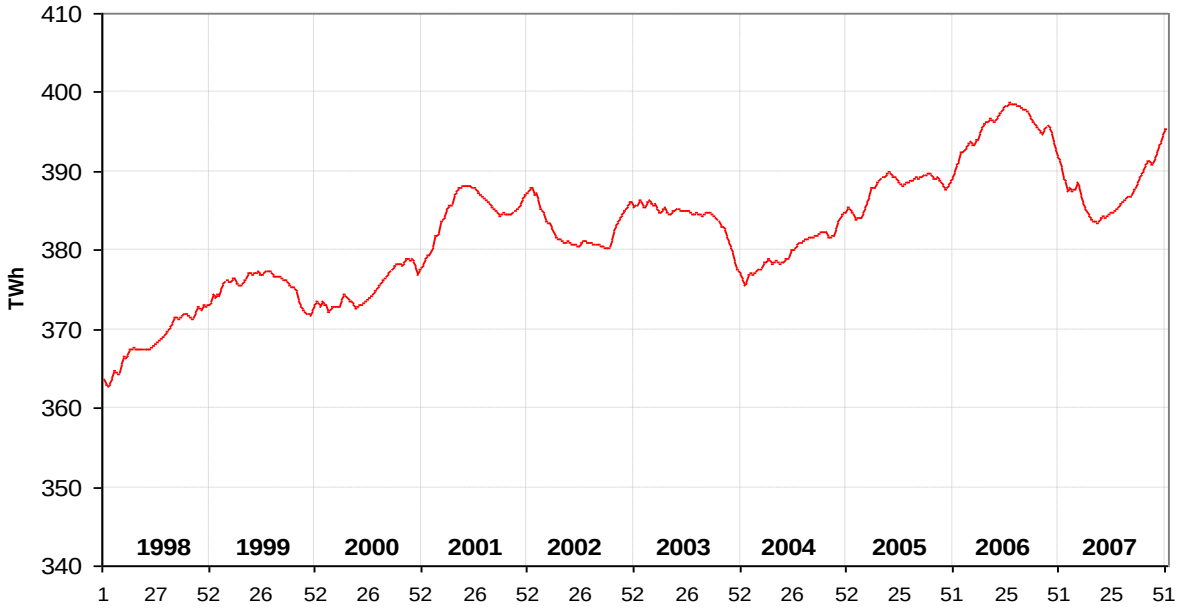

Figure 4. Development of the total electricity consumption in the Nordic region (previous 52 weeks), 1998-2007
Source: Nord Pool Spot

Figure 5 illustrates the development of the total electricity consumption in the Nordic region during 2005-2007. The figure shows the effects weather conditions have on the demand when compared with figure 6.

Winter and spring were very mild in the Nordic region in 2007 resulting in electricity consumption below that of previous years.

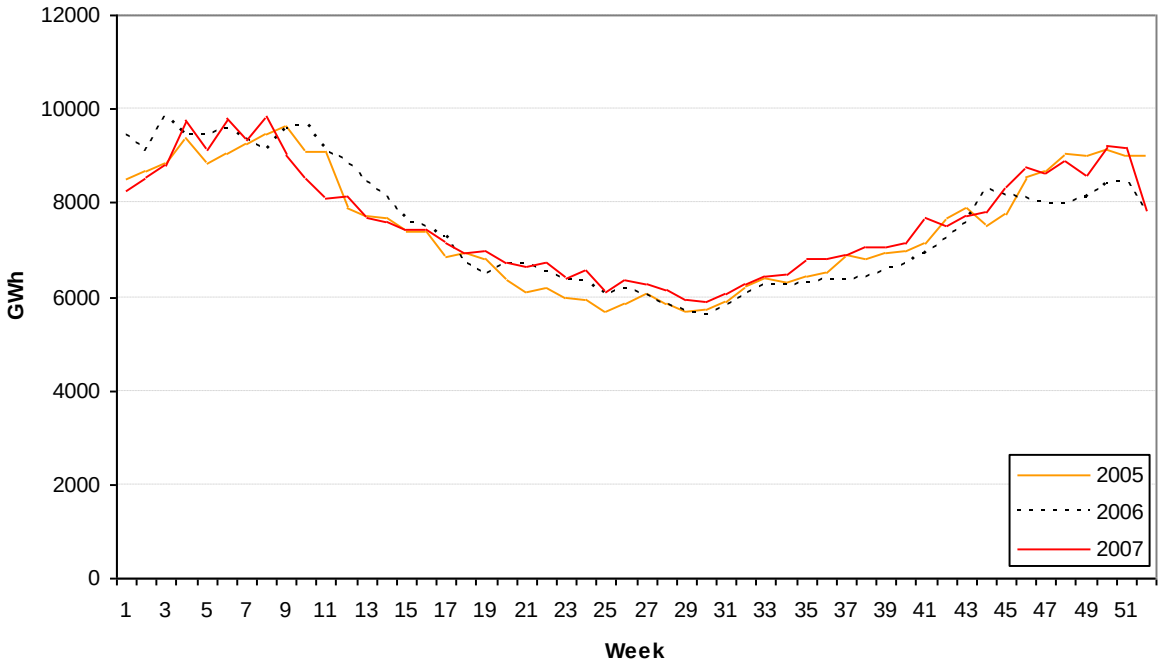

Figure 5. Electricity consumption in the Nordic region (GWh/week), 2005-2007
Source: Nord Pool Spot

All Nordic countries except Denmark have high electricity consumption per capita compared to other European countries, see table 3. A common feature of countries with high per-capita electricity consumption is that they have a high heating requirement due to a cold climate and/or have a large share of energy intensive industries.

Table 3. Electricity consumption per capita, 2007*
Source: Nordel

	Denmark	Finland	Norway	Sweden	Nordic region
Total electricity consumption (GWh)	36 446	90 434	127 352	146 402	400 634
- household consumption (GWh)	9 778	21 150	37 425	39 400	107 753
Population (million)	5,5	5,3	4,7	9,1	24,6
Household consumption per capita (kWh)	1 786	3 991	7 954	4 291	4 505

* Please note that all figures in the table are preliminary

The customer categories in the Nordic countries are quite similar as shown in table 4.

Table 4. Electricity consumption for different customer categories, 2007
Source: Nordel

	Denmark	Finland	Norway	Sweden	Nordic region
Households	29%	24%	34%	30%	29%
Industry (incl. energy sector)	29%	55%	42%	45%	45%
Trade and services (incl. transport)	32%	20%	23%	21%	22%
Other (incl. agriculture)	10%	1%	1%	5%	3%

In three countries – Sweden, Finland and Norway – industry is responsible for a considerable amount of total consumption due energy-intensive industries. Danish consumption is much more evenly distributed between households, industry and transport etc. and with farming consuming a significantly larger share of electricity than in the other Nordic countries. Norwegian households consume considerably more electricity than households in the other Nordic countries while in Finland the share of electricity consumption by industry is significantly larger than in the other three countries.

4.3.1 Temperatures in the Nordic region

2007 was characterised by the relatively high temperatures in the Nordic region throughout the year. Apart from a period in February/March, the temperature was higher compared to a normal year. In particular, the warm weather in early October until the end of the year reduced the demand for electricity for heating purposes.

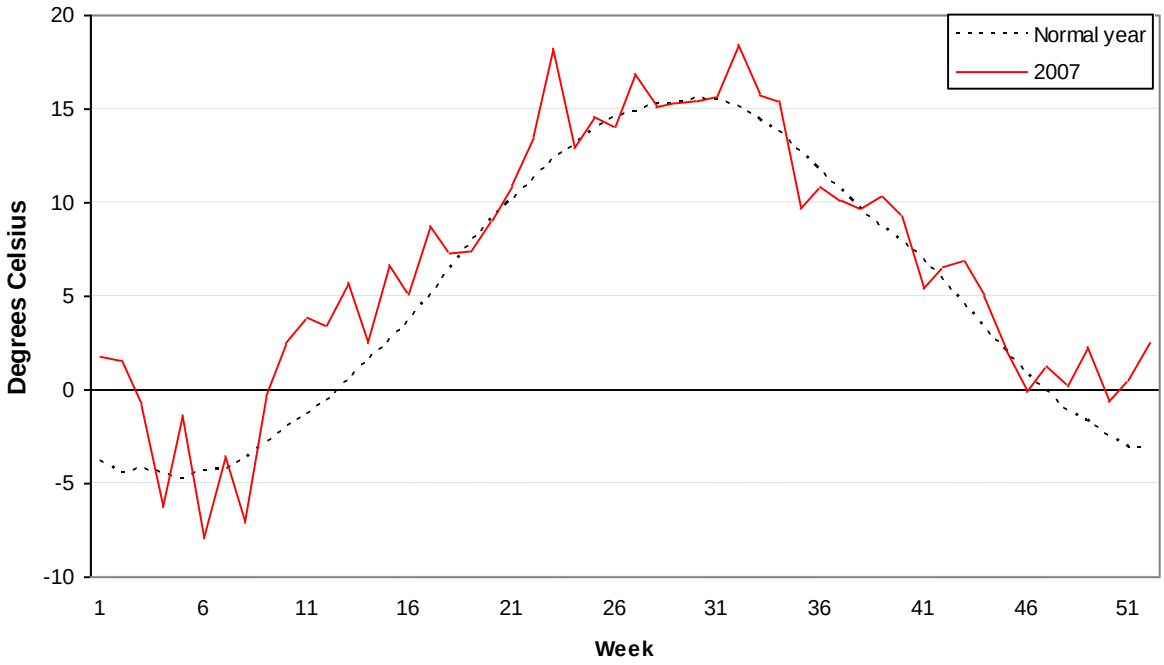

Figure 6. Mean temperature in the Nordic region[1] in 2007 compared to a normal year
Source: Nord Pool Spot

[1] Temperature measured weekly in 12 Nordic cities (Oslo, Bergen, Trondheim, Tromsø, Helsinki, Ivalo, Stockholm, Gothenburg, Östersund, Luleå, Copenhagen and Billund).

4.3.2 Peak load

Peak load[2] usually occurs during periods of cold spells. In 2007, the peak load in the Nordic region was 68 111 MW and took place on February 21, hour 19, week 8. In Denmark the peak load took place on January 24, hour 18 with a load of 6 372 MW. The Finnish peak load happened on February 8, hour 7 with a load of 14 808 MW. Norway had its peak on December 14, hour 8 (21 450 MW) while the Swedish consumption peaked on February 21, hour 18 (26 200 MW).

The load during week 8, i.e. the Nordic peak load situation, is illustrated in figure 7. The load decreases significantly during night-time and peaks during the morning and late afternoon. The morning peak coincides with the time people arrive to their place of work while the afternoon-peak is related to cooking, washing, increased heating demand and turning on TVs when getting home from work.

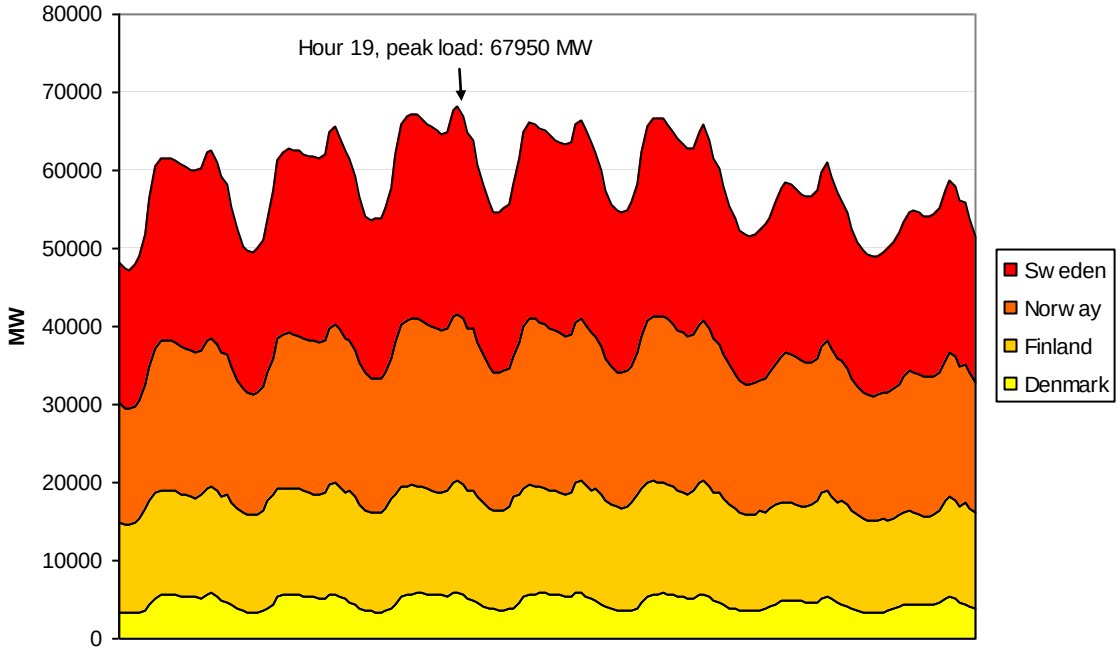

Figure 7. Load in the Nordic region during week 8, 2007
Source: Nord Pool Spot

During the most strained hour in the Nordic region in 2007, February 21, hour 19 the consumption in all countries exceeded production leading to a net exchange (net import) of 11 887 MW from adjacent countries, see figure 8. In cold spells, such as week 8, most of the generation capacity of the Nordic region is taken into operation.

[2] Peak load is defined as the maximum instantaneous electricity consumption or the maximum average electricity consumption over a designated interval of time.

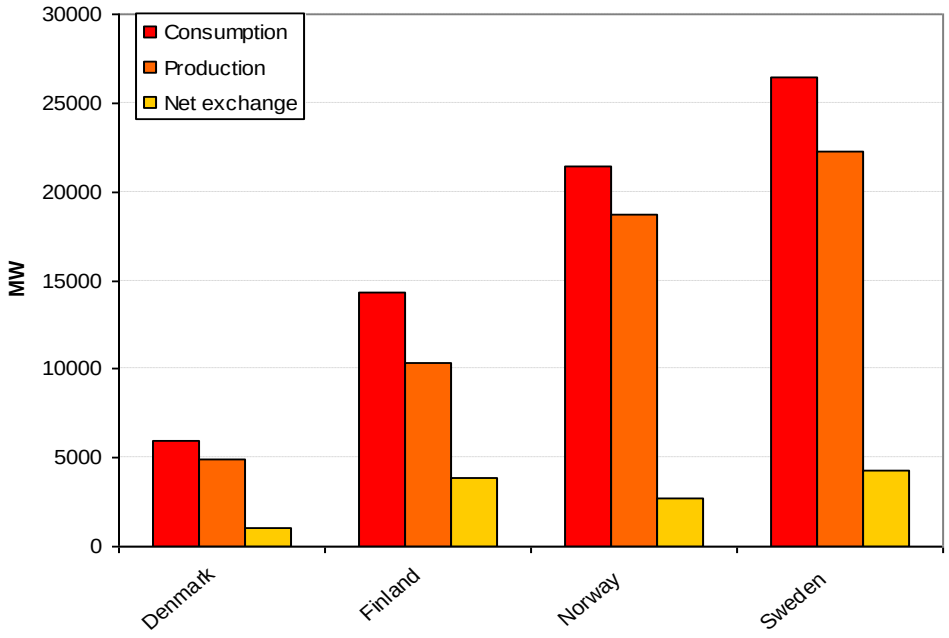

Figure 8. Consumption, generation and exchange in the Nordic region, February 21, hour 9
Source: Nord Pool Spot

4.4 Security of supply

4.4.1 Finland

In the winter season 2006 – 2007, the average hourly demand for electricity reached its peak value of 14,808 MW. The consumption peak signifies the highest average hourly demand measured so far in Finland. During the consumption peak, the amount of electricity generated in Finland was approx. 12,000 MW (average hourly demand), and electricity imports from the neighbouring countries amounted to approx. 2,800 MW. At the start of 2007, the largest amount of electricity generated simultaneously in Finland was approx. 12,600 MW. In 2007, electricity consumption amounted to 90.3 TWh, up 0.3 per cent from the previous year.

In the winter season 2007 – 2008, the peak demand was forecasted to be approximately 15.300 MW (maximum hourly demand), i.e. approximately 2.000 MW higher than the available electricity generation capacity. It was estimated that the electricity transmission capacity from the neighbouring countries to Finland in the winter season 2007 – 2008 was at least 3.800 MW. The resulting output deficit (2.000 MW) was forecasted to be covered by electricity imports from the other Nordic countries, Estonia and Russia.

During the consumption peaks in February 2007 and January 2008, the domestic generation capacity and electricity import capacity were sufficient to cover Finland's electricity consumption, due to which there was no need to restrict consumption.

In 2007, the maximum electricity transmission capacity from the neighboring countries to Finland was approximately 3 850 MW. In 2011, the electricity transmission capacity will increase when a new transmission connection from Sweden to Finland (Fenno-Skan 2) is scheduled to be in operation.

In order to secure a sufficient supply of electricity, the production capacity of the old power plants in particular must be ensured by taking sufficient service and maintenance measures. Replacement investment projects will not increase generation capacity, unless the availability of the old power plants is maintained at the same time. Rapid and effective communication between the key parties will further the management of potential disturbances or restrictions in the import of electricity.

4.4.2 Sweden

The electricity consumption in 2007 peaked in February at a level of 26 200 MW. The electricity production in Sweden was then 23 250 MW and the net import was 2 950 MW. There were good margins in both generation capacity and in electricity transmission capacity during the entire year. The addition from new electricity generation capacity amounted to 2 TWh in 2007. A large number of projects in new generation capacity are planned for the next few years. There is a great deal of uncertainty about these projects but if all of them will be launched, it will be possible to increase the amount of electricity generated per year by 19 TWh by 2014. Improvements in the output of the nuclear power stations will account for 40 per cent of the increase, while thermal power projects will account for 35 per cent and wind power projects for 24 per cent.

4.4.3 Denmark

Electricity consumption in Denmark peaked in January. The deficit was covered by imports from adjacent countries. Both generation capacity and transmission capacity was adequate to support the consumption throughout the year without interruptions or restrictions in consumption. For the most of 2007 Denmark was a net exporter of electricity.

There are currently no plans for major addition to the total Danish generation capacity, however an increased development and use of renewable energy sources – i.e. wind power – is scheduled for the coming years.

4.4.4 Norway

Norwegian electricity consumption peaked December 14, hour 8, with a level of 21 450 MW. There were Norwegian net export at the time, as the electricity production was 24 426 MW. In Norway, more than 95 percent of the installed capacity is hydro based, thus production is highly dependent on weather conditions. In 2007, there was almost 20 percent more inflow than normal in Norway. High inflows contributed to Norway beeing net exporter during most of the year.

Installed Norwegian power production capacity was 30 313 at the turn of 2007 - 2008, an increase of 1045 MW from the year before. The new gas powered plant Kårstø amounts for 420 MW of the new capacity. The Nor-Ned cable (700 MW) connecting the Norwegian and Dutch power systems was planned to be opreative in autumn 2007, but was postponed to May 2008. The cable contributes to improved sequrity of supply in Norway.

4.5 Generation and consumption: Conclusions

The unique mix of generation sources in the Nordic region in combination with the different weather situations in the region has to be taken into account when comparing electricity generation and consumption patterns with other European countries.

The high share of hydropower, representing virtually all of the Norwegian and nearly half of the Swedish generation capacity, has a great influence on the amount of electricity generated from various sources, thus making levels of precipitation vital when calculating and analysing potential generation levels. In addition, the Nordic region has significantly colder winters than any other European country, influencing the consumption as many households are electrically heated.

The overall electricity consumption in the Nordic region in 2007 was significantly below consumption in 2006 due to relatively mild temperatures reducing the demand for electricity for heating purposes.

During periods of peak consumption the Nordic power system proved sufficient to ensure security of supply without restrictions on consumption or interruption based on capacity constraints.

5 Electricity transmission

Today, the transmission grids in the Nordic region are closely linked together providing a solid foundation for a common Nordic electricity market. The transmission grids were originally built to meet the needs of each country, but early in the development of the national power systems it was recognized that the systemic differences between the countries meant that linking the systems together would enhance security of supply and make possible a more efficient use of the existing generation capacity.

5.1 Transmission network

The Nordic transmission grid is part of the transmission network in north-western Europe, as shown in figure 9.

Figure 9. Transmission network in north-western Europe
Source: Svenska Kraftnät

The Nordic transmission grid basically combines the whole Nordic region to one synchronous power system (excluding western Denmark). Interconnectors also link the Nordic market to Germany, Poland, Estonia and Russia and from May 2008 a cable between Norway and the Netherlands was taken into commercial use. However, as illustrated in the figure, there are no transmission lines connecting western Denmark to eastern Denmark. Eastern Denmark is synchronous with the Nordic grid while western Denmark is synchronous with the UCTE area in continental Europe. However a cable linking eastern Denmark and western Denmark is planned to be operational in spring 2010.

Each Nordic country has an appointed Transmission System Operator (TSO). The TSO's are responsible for the safe operation of the grid while allocating as much interconnector capacity as possible to the market.[3] The Nordic TSO's have the overall responsibility to ensure balance between supply and demand of electricity during the operating hour.

5.2 Congestions in transmission

Regional differences in the value of electricity create a demand for transportation of electricity. Furthermore there are variations in generation mix, generation costs and consumption patterns across the Nordic countries. This means that demand for transmission of electricity through the Nordic grid can exceed available transmission capacity.

Congestions in the Nordic spot market are handled through market splitting, while internal congestions within TSO control area are handled through counter trade or by reducing interconnector capacity at the bidding area borders. Counter trade is mainly used after gate closure of the day-ahead markets and in certain cases on day-ahead markets in Statnett's control area.

Market splitting was enforced in 83 per cent of the time in 2007, meaning that there were one or more bottlenecks between the spot areas within the Nordic power system. Bottlenecks occur when the demand for transmission exceeds available capacity. In these hours, there will be different prices in two or more areas, and the price differences reflect the value of the connectors between areas. For different reasons the allowed exchange capacities are often lower than the nominal transmission capacities. Figure 10 shows the average reduction of capacities between the different elspot areas expressed as percentages of the maximum capacities in 2007.

[3] Energinet.dk in Denmark, Fingrid in Finland, Statnett in Norway and Svenska kraftnät in Sweden.

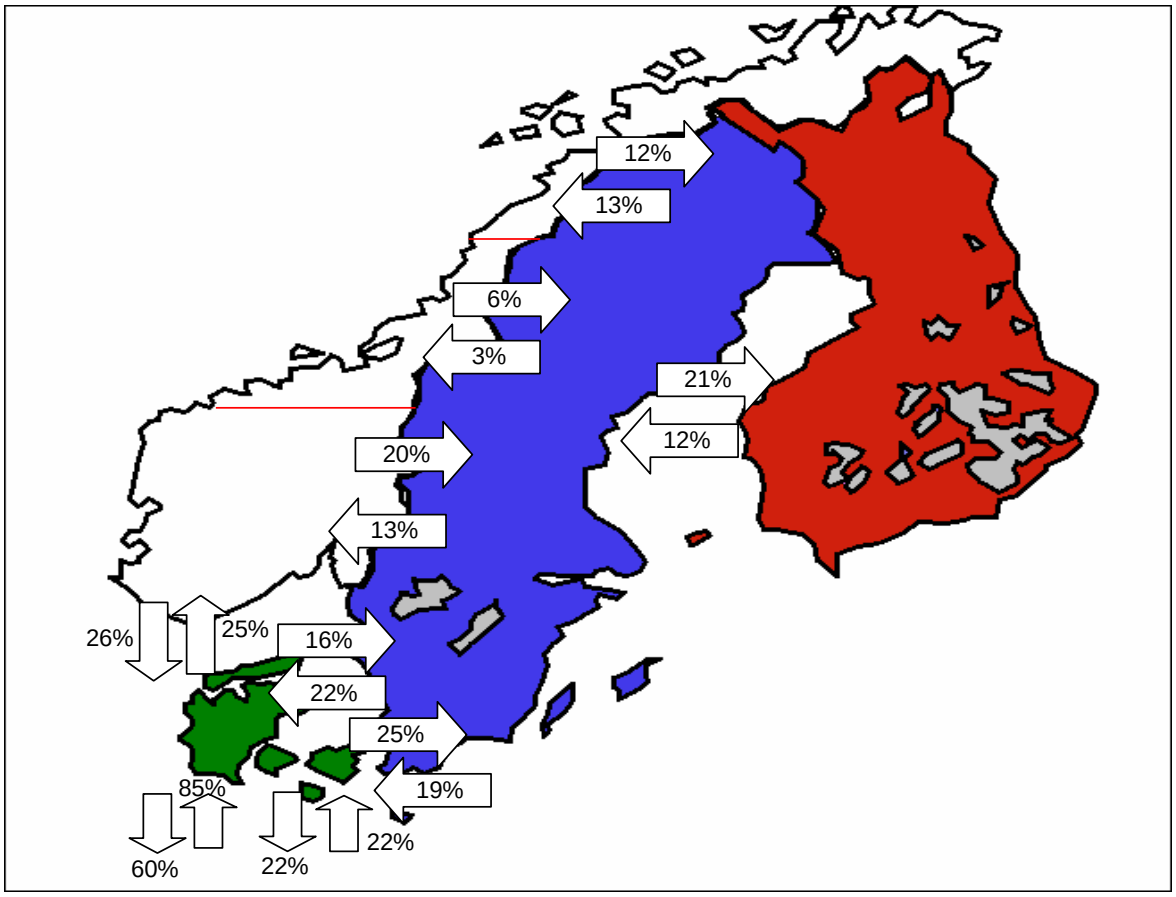

Figure 10. Average reduction of capacities between the different elspot areas expressed as percentages of the maximum capacities in 2007

Substantial reinforcements in the Nordic transmission system are planned to be made in the coming years, generally it is not economically efficient to expand the network capacity to a level where the demand for transmission is met in all hours and at all interconnectors.

Nordel, the organisation for collaboration between the Nordic transmission system operators, has identified the following five areas, or cross-sections, where the electricity network should be strengthened:

- The SouthWest Link between central/southern Sweden and southern Norway
- The Great Belt Link in Denmark
- The new Fennoskan 2 Link between Finland and Sweden
- The new Nea-Järpströmmen Link between Norway and Sweden
- The new Skagerrak Link between Denmark and Norway

Four of the five cross-sections listed above have already been decided[4], while energinet.dk and Statnett has made a letter of intent on the new Skagerrak link. If all goes according to plan, the reinforcements to the first four links will be commissioned between 2008 and 2014. The aim of the investments is to prevent transmission constraints and to increase security of supply in the Nordic market.

[4] Prioritised cross-sections reinforcement measures within the Nordic countries, Nordel 2006.

The Regulation 1228/2003 provides in Article 8(4) for the Commission to "… amend the Guidelines on the management and allocation of available transfer capacity of interconnections between national systems set out in the Annex, in accordance with the principles set out in Articles 5 and 6, in particular so as to include detailed guidelines on all capacity allocation methodologies applied in practice and to ensure that congestion management mechanisms evolve in a manner compatible with the objectives of the internal market. …"

Based on Regulation 1228/2003 Congestion Management Guidelines have been amended for the management and allocation of interconnection capacity by the 1st of December 2006. They are based on the following principles arising from the Regulation:

- Economic efficiency and promotion of competition,
- maximization of capacity available and use of interconnectors,
- transparency on a non-discriminatory basis,
- secure network operation, and
- revenue neutral mechanism.

According to Article 9, the regulatory authorities, when carrying out their responsibilities, shall ensure compliance with this Regulation and the guidelines adopted pursuant to Article 8. Where appropriate to fulfill the aims of this Regulation they shall cooperate with each other and with the Commission.

The Nordic regulators have monitored the compliance with the Regulation and the annexed Guidelines through participating in the European Regulators monitoring exercise – the first of which took place in 2007 and the second will follow at the end of this year – and through preparing a Nordic monitoring report in 2007. The work to improve the implementation of the rules continues.

The mandates and powers of the regulatory authorities with regard to the supervision of transmission system operators differ, from very limited powers of the Swedish regulator to a situation where NVE as a regulatory authority has the power to approve the Nordic Grid Code.

5.3 Electricity transmission: Conclusions

The Nordic region operates almost entirely as one synchronous power system through transmission grid. The combined system has enabled an increased security of supply as well as a more efficient use of the generation capacity – during wet years hydropower flows southwards and eastwards whereas during dry years thermal power flows northwards and westwards.

However, increasing cross border power flows also strain the transmission lines and increase the demand for transmission capacity. Sometimes this leads to congestion. Congestions occurring between the Nord Pool bidding areas are handled through market splitting, while internal congestions in general are handled through counter trade or by reducing interconnector capacity at the bidding area borders. Counter trade is mainly applied after gate-closure of day-ahead markets and in certain cases on day-ahead markets.

Congestion management is currently one of NordREG's most prioritised issues and in 2007 NordREG published a compliance report concerning congestion management guidelines

under Regulation 1228/2003 which evaluates the current status of compliance and sets out the further work to TSOs and regulators for ensuring full compliance with the CM guidelines.

6 Wholesale power market

The wholesale power market is a common Nordic market, where electricity is traded on the Nordic electricity exchange, Nord Pool Spot. The market participants at Nord Pool – more than 400 members from over 20 countries – are electricity generators, electricity suppliers, portfolio managers, industrial companies and other large electricity consumers.

Nord Pool was founded in 1993 in Norway as Statnett Marked. In 1996 Sweden joined the power exchange and the world's first multinational exchange for trade in power contracts was created. Statnett Marked was renamed as Nord Pool. In 1998 Finland joined Nord Pool and in 1999 Western Denmark joined the market place. In 2000 the Nordic wholesale power market became fully integrated when Eastern Denmark joined Nord Pool.

Trading at Nord Pool is voluntary, however all cross-border trading must be done at Nord Pool Spot. About 70 per cent of the power generated in the Nordic region is traded via Nord Pool's physical spot market. The remaining 30 per cent is traded bilaterally. The Norwegian Water Resources and Energy Directorate (NVE) are responsible for regulating Nord Pool Spot.

The Nordic region consists of several bidding areas at Nord Pool. During 2007, there were two areas in Denmark, one in Finland and Sweden respectively and three areas in Norway. The capacities for the exchange of electricity between the areas are calculated and coordinated by the TSO's and distributed to Nord Pool Spot for exchange purposes, before price calculation at Nord Pool Spot. The prices for the spot areas and the flow between the areas are then calculated. This ensures an exchange where electricity flows from a low price area to a high price area. If the available capacity between the areas is adequate, the prices will be equal. If not, there will be price deviations between the spot areas.

The physical market at Nord Pool consists of two sub-markets, the day-ahead market *Elspot* and the intra-day market *Elbas*. In the day-ahead market, electricity is traded for the next 24 hours. In the intra-day market, participants in Finland, Sweden, Germany and Denmark can trade for the forthcoming day after the day-ahead spot market has closed. Remaining transmission capacities or capacities in the opposite direction of the day-ahead outcome is available for the intra-day market. In the financial market the players can secure prices for future purchases or sales of electricity.

The Nordic market also has a common regulating market in order to ensure the balance between generation and consumption in the hour of operation. The different market solutions are used depending on the distance to the operating hour, see figure 12.

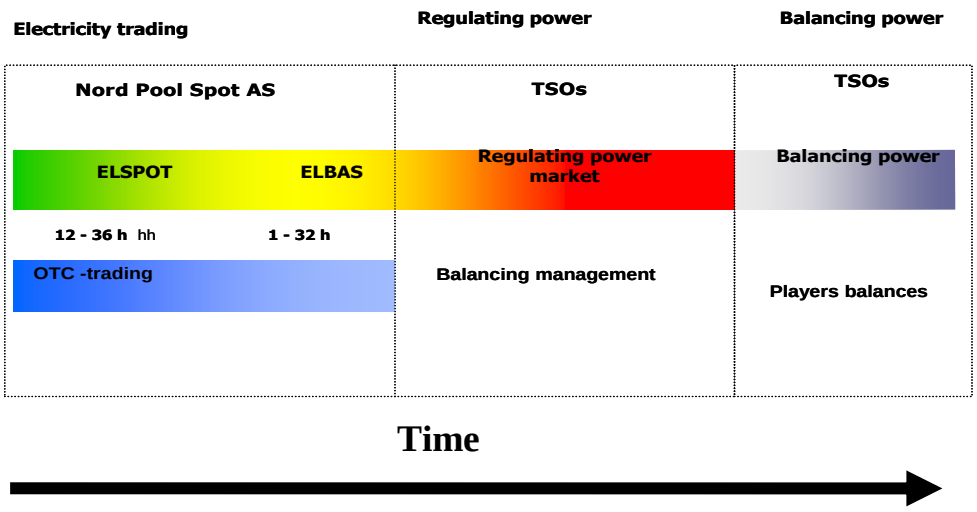

Figure 12. Nordic electricity markets

Market players can list their available generation/limited consumption volumes and accompanying price to the TSO's for the regulating market (common bid ladder for Nordic TSOs). This is a helpful tool for the TSOs, which have the overall responsibility to ensure the momentary balance between supply and demand. The TSO's can then employ the right regulating object after taken into consideration location and capacities in the network.

6.1 Price development in the spot market

The Nord Pool system price[5] has varied considerably since 1996 (See figure 13). In 2007 the average system price was 27.88 Euro/MWh, compared to 48.64 Euro/MWh in 2006. The average price in 2005 was 29.30 Euro/MWh. The highest monthly spot price in 2007 was noted in January, when the average system price reached almost 48 Euro/MWh.

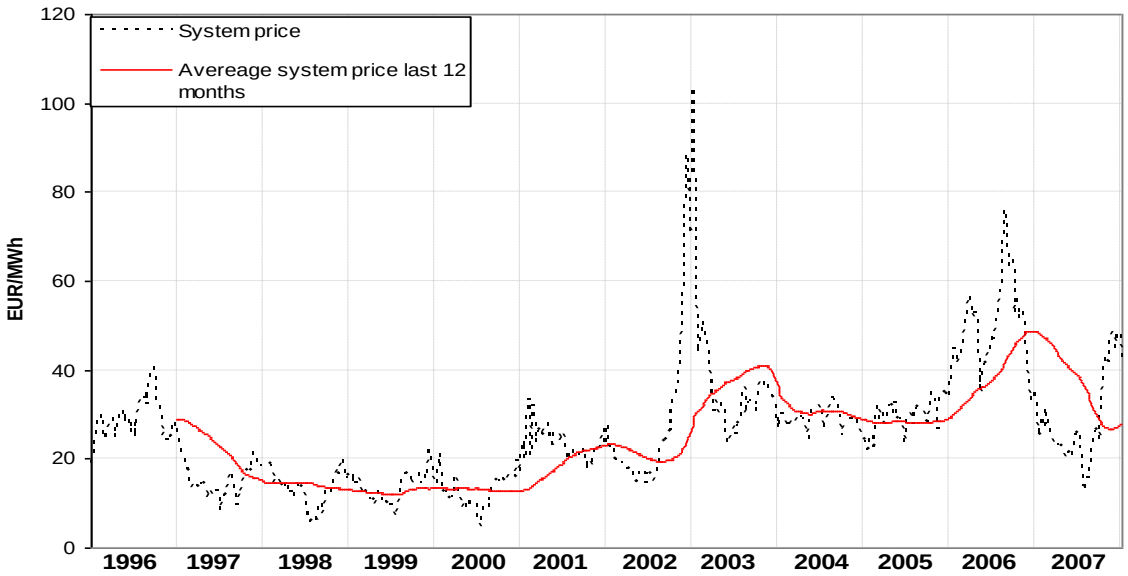

Figure 13. Development of monthly system price at Nord Pool Spot, 1996-2007
Source: Nord Pool

[5] The system price is calculated as the price that will be realized if there are no congestions between elspot areas.

There are significant differences between the different Nord Pool spot areas, see table 6. The highest average price during 2007 was in eastern Denmark while southern Norway had the lowest average price. The table also indicates that prices in the whole Nordic region were heavily affected by the low reservoir levels during 2006. Consequently the prices increased when more expensive thermal heating units had to compensate the lack of hydropower. In 2007, inflows were at a more normal level and prices went down.

Table 6. Average price in the different Nord Pool spot areas, 2007
Source: Nord Pool Spot[6]

Spot prices EUR/MWh	2007	Change from 2006
Finland	30.01	-38%
Western Denmark (DK1)	32.40	-27%
South Norway (NO1)	25.73	-48%
Middle Norway (NO2)	29.59	-40%
North Norway (NO3)	29.43	-40%
Sweden	30.25	-37%
Eastern Denmark DK2)	33.01	-32%

The price differences between the spot areas in 2007 shows that the price in Sweden (SE) was lower than the price in Finland (FI) in 1 per cent of the hours in 2007 (See table 7). The price in the Danish spot area DK1 was higher than the price in the Norwegian spot area NO1 in 47 per cent of the hours in 2007. Sweden was the spot area that most seldom constituted a separate spot area. In 2007 there was a common Nordic price for more than 28 per cent of the time.

Table 7 Price differences between Nordic spot areas, 2007
Source: Nord Pool Spot

2007		NO1	NO2	NO3	SE	FI	DK1	DK2
		Less than						
NO1	Higher than		10%	12%	11%	13%	16%	10%
NO2		43%		6%	4%	8%	21%	10%
NO3		42%	0%		3%	7%	21%	9%
SE		40%	10%	14%		4%	19%	6%
FI		40%	11%	13%	1%		19%	6%
DK1		47%	33%	34%	27%	29%		15%
DK2		44%	26%	28%	19%	22%	23%	

A duration curve of the spot prices in the Nordic region – listing the amount of hours the price has been below a certain level – reveals that the Danish price areas had higher prices than the other countries for a relatively long time. The highest price in western and eastern Denmark was 943.04 Euro/MWh. That also constitutes the highest price in the Nordic region during 2007, see figure 14.

[6] NO2 and NO3 was a joint area until 19 November.

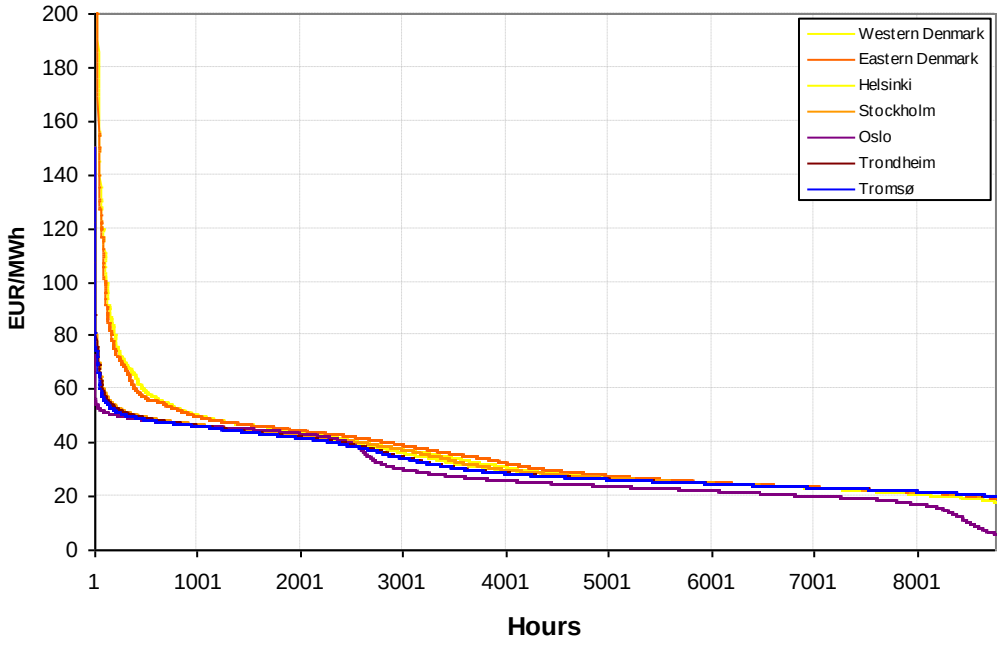

Figure 14. Duration curve of different spot prices, 2007
Source: Nord Pool Spot

There are considerable difference between a hydro dominated system and a system dominated by thermal power as figure 15 illustrates.

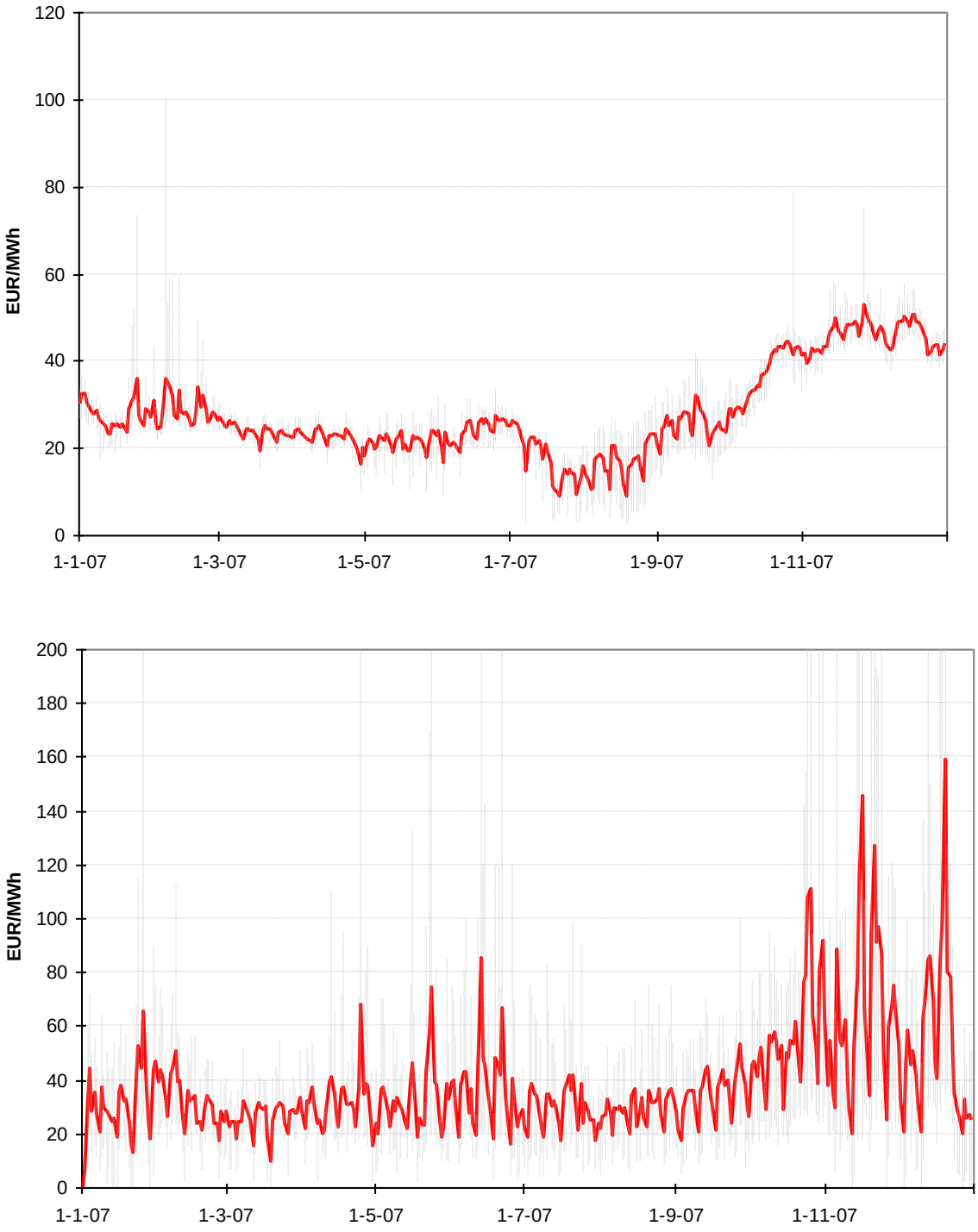

Figure 15. Comparison between the Nordic system price (Nord Pool) and German wholesale price (EEX)
Source: Nord Pool Spot and EEX

Figure 16 illustrates the Nord Pool system price together with the forward price for the forthcoming period until 2010. In 2007 the average system price was 27.88 EUR/MWh compared to 49.35 EUR/MWh in 2006. For the first half of the year 2007 the system price was at an unusual low level, following the exceptionally wet and warm autumn of 2006. From August it began to rise again following the expected cycle of low prices during summer and

higher prices during winter. However the price level at the end of the year was still below the average price for 2006.

The price expectations for the next three years are at level with the average price for 2006. The forward price follows an expected cycle of lower prices during the summer and higher prices during the winter.

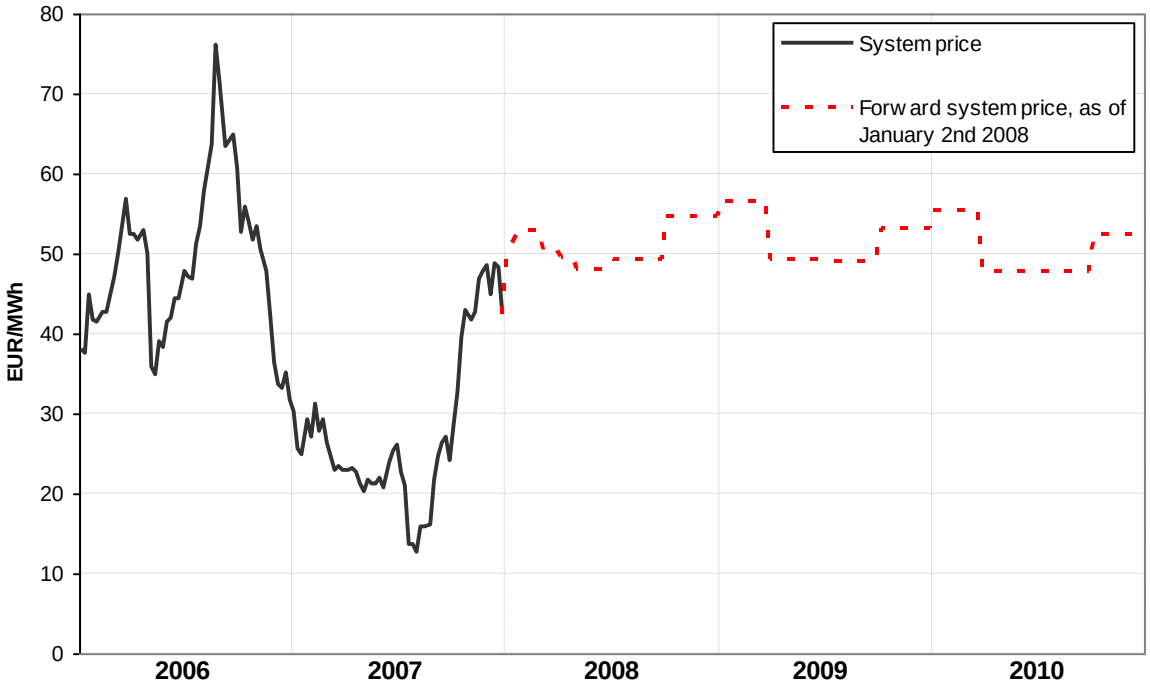

Figure 16. Weekly Nord Pool system and forward prices
Source: Nord Pool Spot

6.2 Conditions for generation

The two main sources of electricity generation in the Nordic region are hydropower and thermal power making inflow, reservoir levels and the price of CO_2 emissions important factors in the price formation of electricity.

Inflow and reservoir levels are of crucial importance for hydropower generation. Even though electricity in itself can not be stored, the water creating the electricity can be stored in reservoirs along the rivers. The main bulk of the inflow to the reservoirs occurs during the spring when the snow in the mountains melt and during rainy autumns.

In 2007 the inflow was generally higher than in 2006 and at level with 2005 as figure 17 shows, thus making 2007 a more normal year than 2006, which for a large part can be characterized as a dry period.

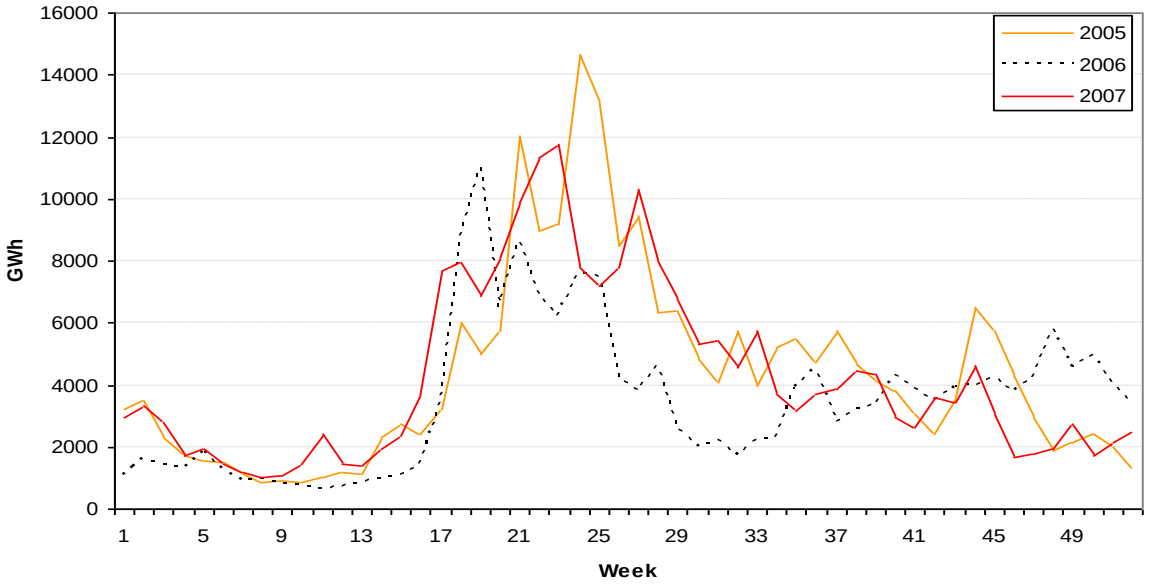

Figure 17. Effective inflow to the Nordic water reservoirs, 2004 – 2007
Source: Nord Pool Spot

Reservoir levels in 2007 were – apart from the first quarter – higher than normal, see figure 18. This is a key factor in explaining the low prices of electricity through most of 2007.

At the beginning of 2007, the total reservoir levels in the Nordic region were 66 per cent of the total capacity. In Norway the reservoirs have a capacity of 84.1 TWh, of which 81.9 TWh is accounted for in this data set. Swedish reservoirs have a capacity of 33.8 TWh, while the capacity in Finnish reservoirs is 5.5 TWh. The total Nordic reservoir capacity is 123.4 TWh. At the end of 2007, the reservoir levels in the Nordic region were 76 per cent of the total capacity.

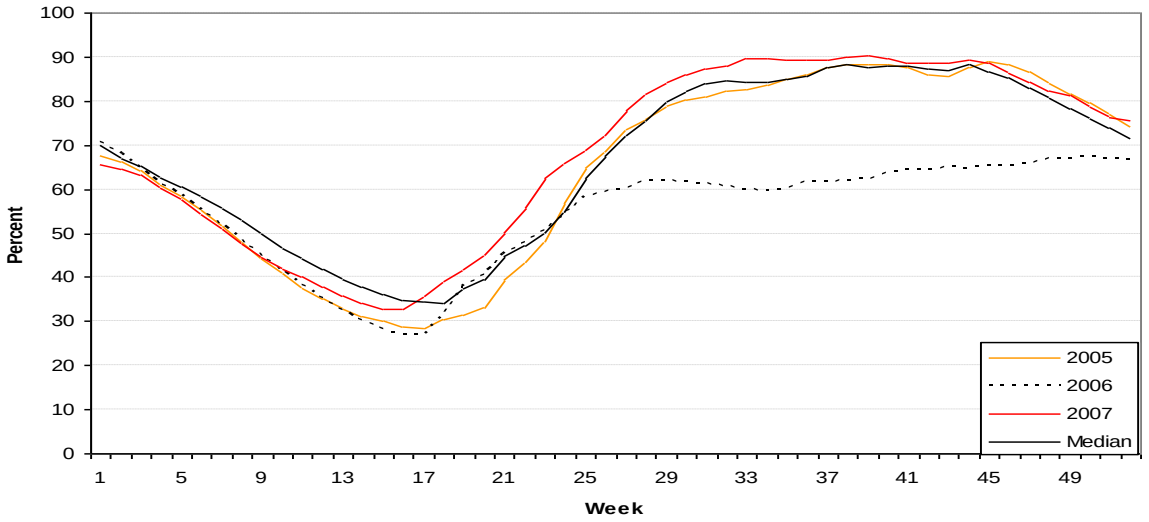

Figure 18. Reservoir levels in the Nordic region, 2005 – 2007
Source: Nord Pool Spot

The second largest generation technology in the Nordic region is thermal power. New costs were added to thermal power producers with the implementation of CO_2 quotas and tradable

CO_2 allowances in 2005. This makes the price on CO_2 emissions an important factor influencing the price on electricity. Most of the thermal generation units within the Nordic region are located in Denmark and Finland.

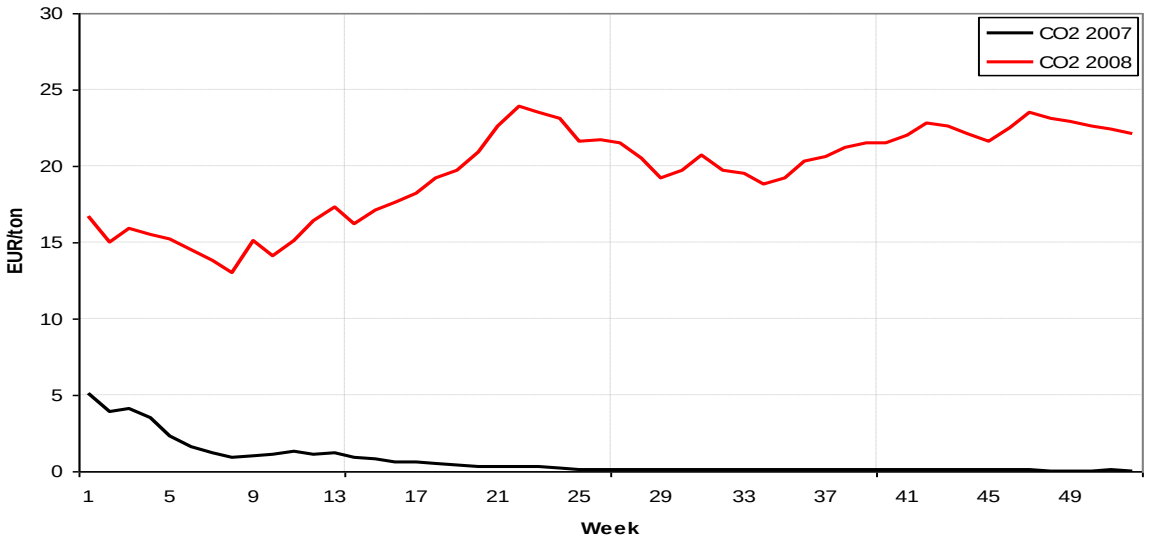

Figure 19. Price on CO_2 allowances on Nord Pool, 2006 and 2007
Source: Nord Pool Spot

The price for CO_2 allowances on Nord Pool during 2007 has been extremely low, see figure 19. With a starting price of 5.13 Euro/ton in January prices decreased dramatically through the first half of the year resulting in a price around 0.10 to 0.15 throughout the remaining half of 2007. It was not possible to transfer allowances from 2007 and into the Kyoto period of 2008. At the start of 2008 allowances was traded at around 23 Euro/ton.

6.3 Volumes in the spot market

The volume traded through the spot market is often regarded to be a measure of liquidity in the spot market. With the exception of 2003, there has been a consecutive increase in volumes traded through the spot market since the formation of Nord Pool in 1993, cf. figure 19. Since 2004 the volumes in the spot market have gone up with an increasing speed. This can to some extent be explained by the introduction of gross bidding. Particularly this has increased the volumes traded in Sweden from 40-45 per cent to approximately 90 per cent. The incentives for some of the larger vertically integrated companies to notify both buying and selling were strongly improved, as the total fees rebated netting from producers with both buying and selling orders.

The total volume traded at Nord Pool Spot in 2007 was over 70 per cent of the total Nordic electricity consumption. The total volume traded at Nord Pool Spot in 2007 was close to 290 TWh, an increase of 16 per cent from 2006. The total value of the 290 TWh traded through the Nord Pool Spot group in 2007 was 9.1 billion Euros.

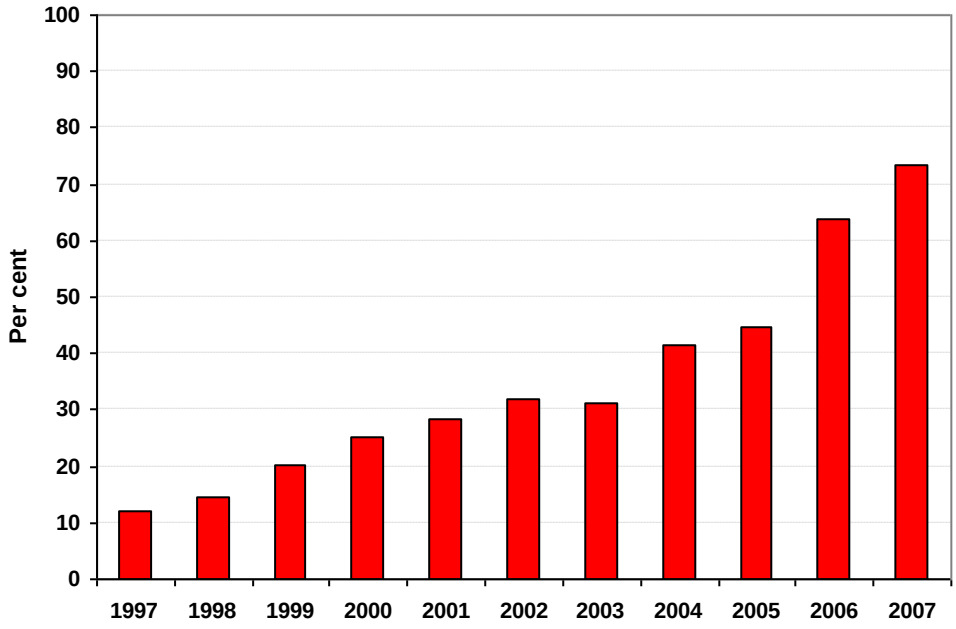

Figure 20. Volumes traded at Nord Pool Spot market as a percentage of total Nordic consumption, 1997 – 2007
Source: Nord Pool Spot

6.4 Cross-border power flows

Figure 21 shows the power exchange between the Nordic and the non-Nordic countries during 2007. The extent of the power exchange is highly influenced by the resource situation. In dry years the power flows north and west, while in wet years the power flows south and east. Likewise, changes in wind power generation influence the power flows, although with a time span of hours instead of months. This illustrates the flexibility of the Nordic power system; power is generated where it is cheapest and it is then transferred to more expensive areas and areas with not enough generation capacity.

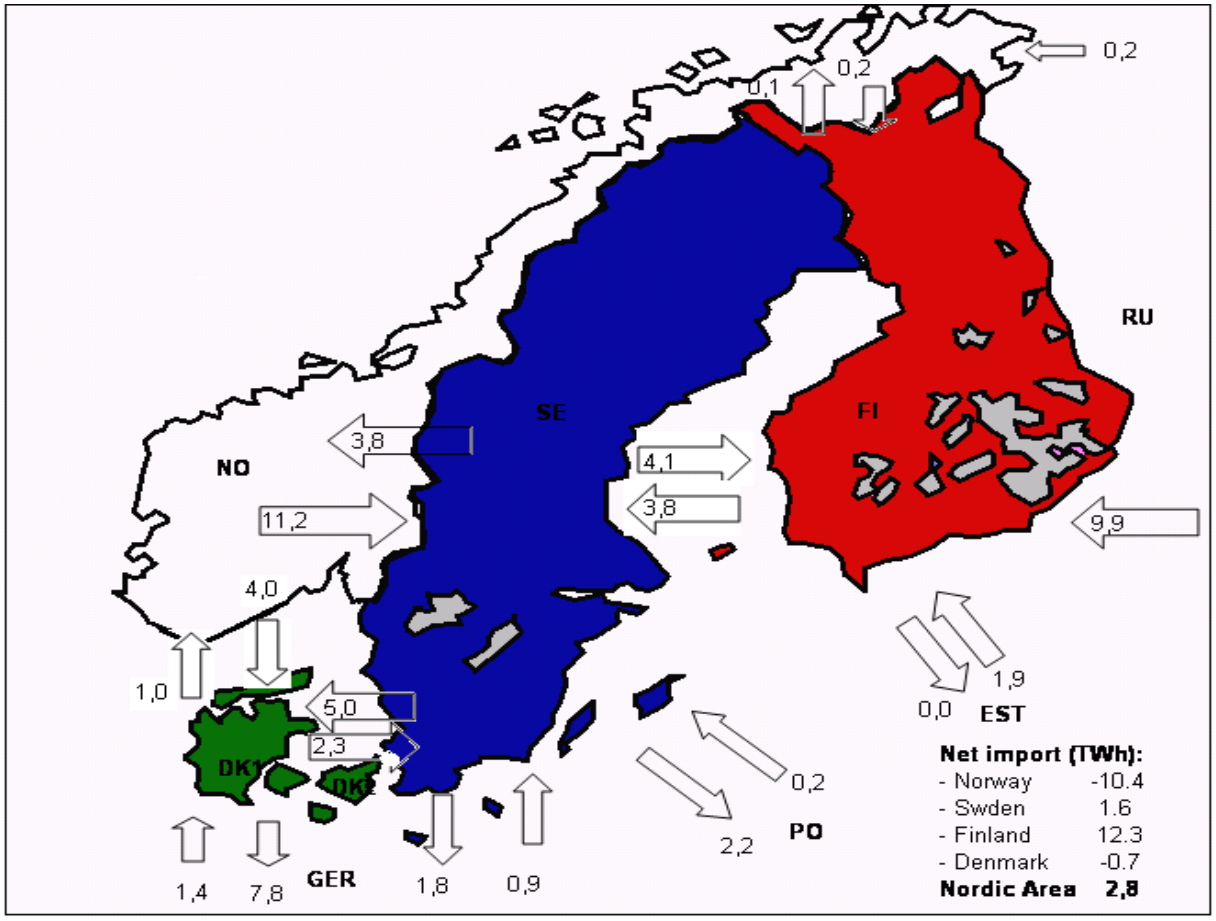

Figure 21. Power exchange, 2007
Source: Nord Pool Spot

Generally the Nordic area has been a net importer of electricity as shown by figure 22. Since 1999 the Nordic region has only been a net exporter in 1999, 2000 and 2005. The import from Russia to Finland accounts for most of the total Nordic electricity import. Due to technical restrictions there has never been a possibility for Nordic export on this connection. The exchange between the Nordic countries and Central Europe (Germany and Poland) varies more with weather conditions.

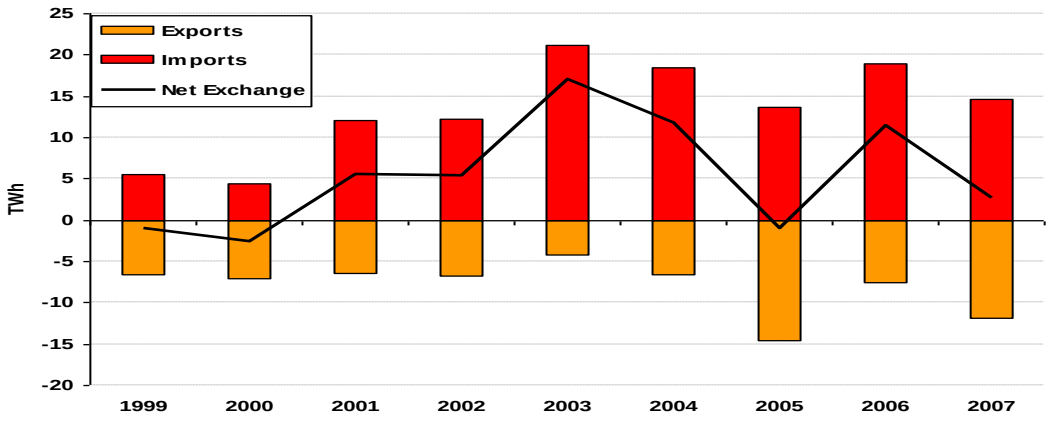

Figure 22. Nordic power exchange, 1999 – 2007
Source: Nord Pool Spot

In 2007, the net import of electricity to the Nordic power system was 2.8 TWh as opposed to a net import in 2006 at 11.4 TWh due to low level of hydro power generation in 2006. This is typical for the Nordic power system.

6.5 Balancing markets

A common Nordic balance settlement is an important part of the development of a common integrated end-user electricity market in the Nordic region.

Nordel presented a first proposal in February 2007 to harmonize important features of balance settlement by 2009.

The Nordel proposal consists of:

- Common principles for cost allocation between balance responsible parties and grid
- Two balances – one for production and one for consumption
- Common model for the settlement of imbalances - one price settlement for the consumption balance and two price settlement for the production balance
- Common fee structure
- Elbas available in all Nordic countries
- Common gate closure for final plans to the TSOs

Nordel has considered having a common balance agreement. Due to big differences between the models applied and national legislations, there will not be a common agreement from 2009. Each country will implement the agreed issues and include them in the national agreements. Nordel intends to include an appendix in the Nordic grid code that will specify what the Nordic TSOs have agreed upon in terms of harmonization of the balance management.

The purpose of balance settlement is in all Nordic countries to settle the imbalances that are the result of electricity deliveries between the parties in the electricity market. The system operators perform two types of balance settlement.

The first is the balance settlement between the countries. Balance power between two countries is priced and settled according to the Nordel System Operation Agreement. Since September 2002, bids from market participants with available regulating capacity are entered into a common price list in the common Nordic Operational Information System (NOIS). There is now a common regulation market and the system operation agreement results in a balance control and balance regulation of the interconnected power system that is much harmonised.

The balance settlement inside the countries is a settlement between the system operators and the balance responsible parties. This settlement is governed by national balance agreements. The balance agreements also describe how the balance responsible parties can participate in the regulation power market.

The total volume of the Nordic balancing market was app. 5 TWh in 2007, see table 8.

Table 8. Volume of Nordic balancing market 2007
Source: Nord Pool Spot
]

	NO1	NO2	NO3	Sweden	Finland	DK2[7]	DK1[8]	Total
GWh	1 930.8	211.6	249.6	1 260.5	18.9	84.9	1 260.1	5 016.4
TWh	1.9	0.2	0.2	1.3	0.0	0.1	1.3	5.0

Among the different Nordic price areas NO1 had the largest volume with 1.9 TWh while Sweden and DK1 had the second largest volumes with 1.3 TWh each.

The total weekly balancing in the Nordic region is illustrated below in figure 23.

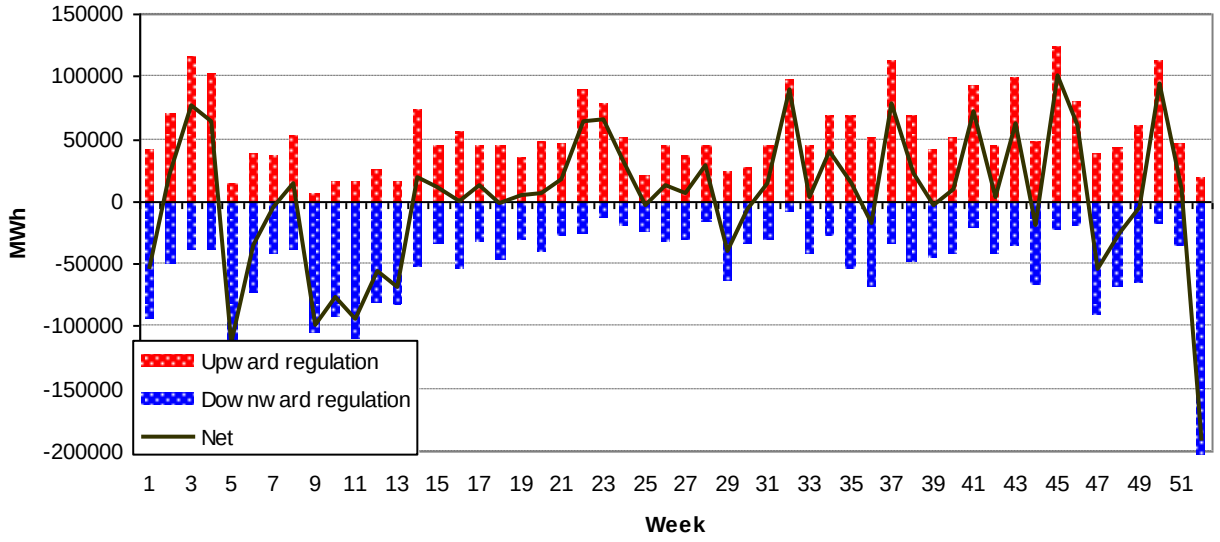

Figure 23. Weekly regulating volumes for the whole of Nordic area
Source: Nord Pool Spot

The largest downward regulation was in week 52 while the largest upward regulation was in week 47.

[7] Sealand
[8] Jutland and Funen

The balancing volume of an average week in the whole Nordic region is shown in figure 24.

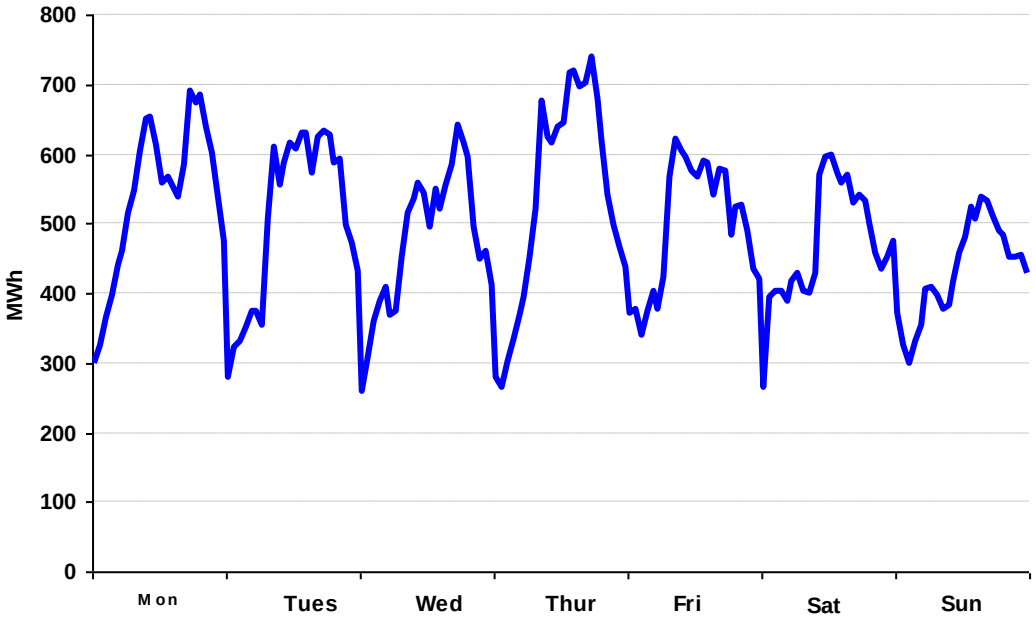

Figure 24. Weekly regulating volumes for the whole Nordic area. MWh, absolute values
Source: Nord Pool Spot

6.6 Main players

Vattenfall AB is by far the largest electricity generator in the Nordic region. The company is owned by the Swedish state. In 2007, Vattenfall generated over 91.1 TWh in the Nordic countries. Vattenfall has 41 per cent of the total Swedish generation capacity and more than 17 per cent of the total Nordic generation capacity.

Fortum Oy is majority owned by the Finnish state. In 2007, Fortum generated 52.2 TWh of electricity in the Nordic region. Fortum has 35 per cent of the total Finnish generation capacity. When adding the Swedish division Fortum holds almost 12 per cent of the total Nordic generation capacity.

E.ON Sverige AB, formerly Sydkraft AB, is majority owned by the Germany Company E.ON (55.3 pct.) and Statkraft (44.6 pct.), which is owned by the Norwegian state. In 2007, E.ON generated 30 TWh in the Nordic region. E.ON Sverige AB has 21 per cent of the total Swedish generation capacity and almost 8 per cent of the total Nordic generation capacity

Statkraft is by far the largest of the Norwegian generators with more than 30 per cent of the total Norwegian generation capacity in a normal hydrological year. The market share becomes even higher if Statkraft's ownership in other Norwegian generation capacity is taken into account. The yearly amount of electricity generated by Statkraft varies heavily because of the large share of hydropower in Statkraft's generation portfolio. According to the annual report, Statkraft generated 44.9 TWh in the Nordic region in 2007 equalling 32 per cent of total generation.

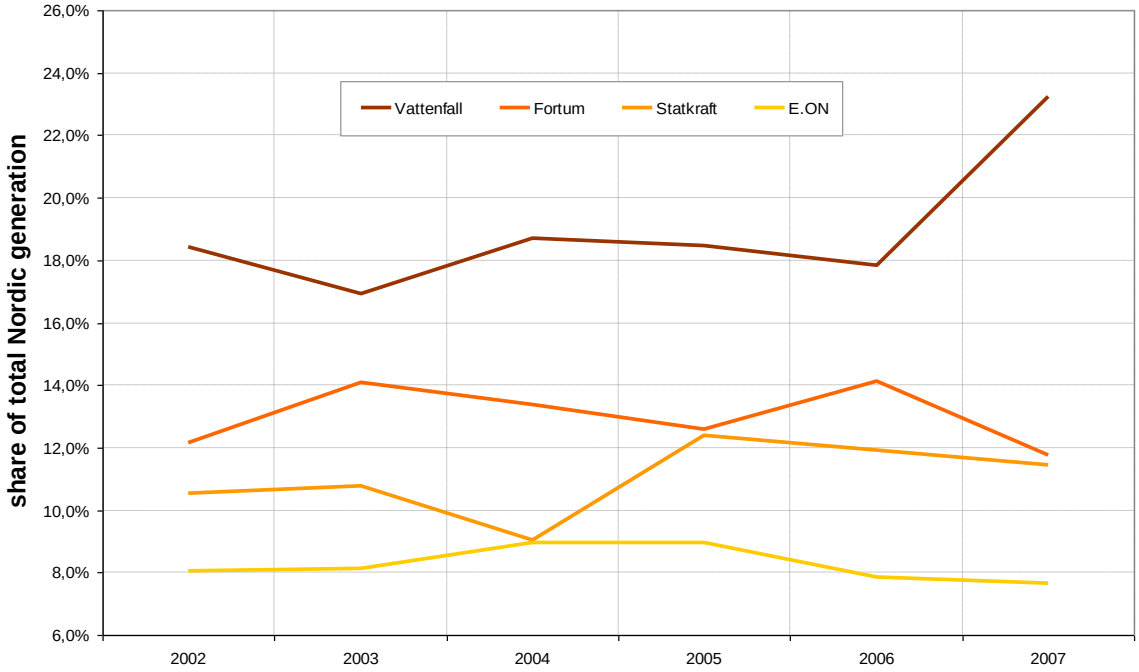

Figure 25. Share of total Nordic electricity generation by the four largest generators, 2002-2007
Source: Swedenergy, Nordel and regulatory authorities

6.7 Wholesale power market: Conclusions

The Nordic wholesale power market is a well functioning electricity market. However, the market is not functioning perfectly and could be improved further. In the market report for 2009 a set of market indicators will be introduced and these could help unveil in which areas improvements are most needed.

Trade at Nord Pool has increased steadily since it was established in 1993. Although trading at Nord Pool is voluntary, more power is now traded on the power exchange than bilaterally.

During 2007 average spot prices at Nord Pool were considerably lower than prices in 2006. The average price for 2007 was even below the average price for 2005. The highest monthly spot price during 2006 was noted in August when the average system price reached 66.53 Euro/MWh. The high prices were partly caused by very low levels in the Nordic hydro reservoirs at the same time as several Swedish nuclear reactors were offline due to technical reasons.

The well-functioning of the Nordic electricity market was well illustrated during 2006. The dry and warm summer together with an autumn with high levels of precipitation created demands for transmitting large quantities of power within the Nordic region. Accordingly, the power within the Nordic market flowed from areas with the less expensive generation sources to areas with more expensive generation sources.

7 Retail markets

Unlike the integrated Nordic wholesale power market, the retail markets in the Nordic region are to a large extent still national in scope. There are several reasons for this. One reason is the lack of a common balancing market within the Nordic region. Another is technical differences for instance in switching models and message formats.

In 2005, the Nordic energy ministers invited NordREG to work towards a common Nordic retail market. You can read more about the progress of this work in chapter 10.

7.1 Development of retail prices

The retail prices in the Nordic countries in 2007 were very similar and followed the same development throughout the year – apart from the Norwegian price peak in August, see figure 26. There is no information available about Danish prices[9]. It should be noted that spot related contracts are used by a minority of the household customers in the Nordic region.

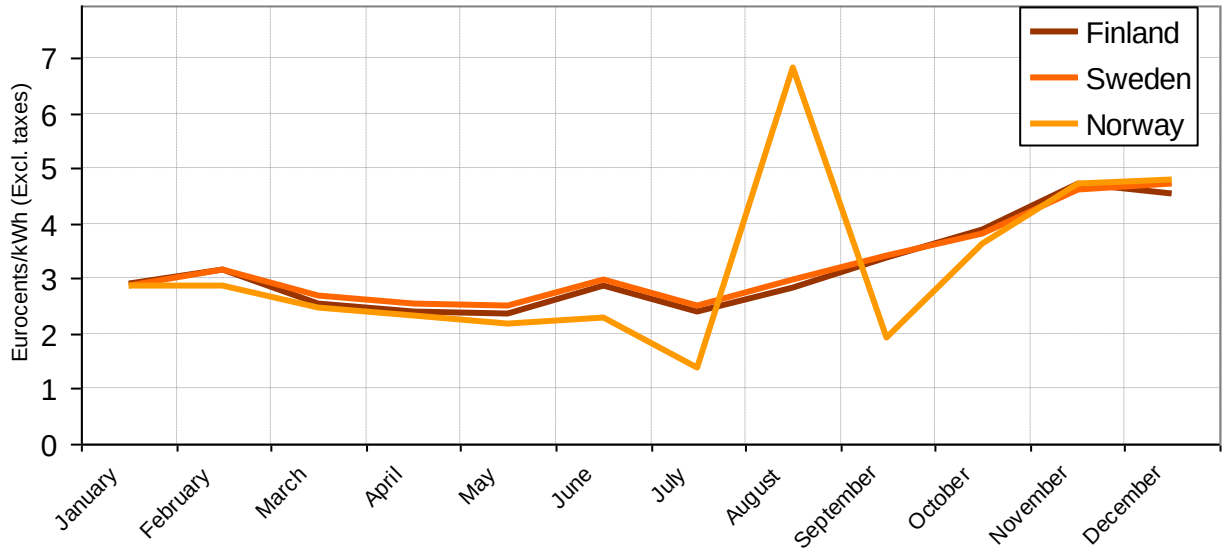

Figure 26. Development of retail prices[10] in the Nordic region, 2007
Source: Regulatory authorities

7.2 Supplier switching

Active customers are essential for a well-functioning electricity market. The share of customers having switched electricity supplier varies considerably between the Nordic countries. The most active customers have been observed in Norway followed by Sweden, where more than half of the households have switched supplier since the deregulations took

[9] The supply obligation product covers more than 95% of the Danish consumers (households and small businesses and enterprises). The Danish supply obligation product is a quarterly product supplied by companies granted a concession. The prices for supply obligation electricity apply for one quarter and are under supervision by The Danish Regulatory Authority (DERA). In 2007 the quarterly average prices for the supply obligation product were respectively 6.4 eurocents/kWh (Q1); 3.8 eurocents /kWh (Q2); 4.0 eurocents /kWh (Q3) and 4.2 eurocents /kWh (Q4).

[10] Spot related prices without taxes. No information available for Denmark.

place. The Danish and Finnish customers have not been as keen to switch supplier. In the Finnish retail market, electricity prices provided by the local suppliers have so far been competitive, thus reducing the customers' interest to switch supplier. In Denmark as well, the low level of supplier switching can be derived from lack of incentives. The presence of regulated maximum prices reduces the possibility for a customer to save money by switching supplier.

The difference in switching activity can be explained by many factors. One of the most important factors is price differences and the possibility to save money from switching electricity supplier. Customers having a limited budget who see that switching supplier can reduce their electricity bill are more likely to switch supplier than others. The tendency to switch supplier also increases with the level of consumption – the bigger the amount of consumption, e.g. customers with electric heating, the larger the resulting absolute savings from lower prices. Obstacles to switching supplier can also be caused by lack of information. Customers who understand how the electricity market functions know that they can easily switch electricity supplier and have access to information about suppliers and their price offers.[11]

The collection of information about switching and definitions of key figures describing switching activity differ among the Nordic countries, which makes precise comparisons difficult.

In Denmark the association of the Danish Energy Companies collects information on switching activity on a quarterly basis. Approximately 21 per cent of the large customers and almost 3 per cent of the small customers changed their electricity supplier in 2007. The switching rate for the small customers is a higher than previous years, but most of the switches can be contributed to a large supplier leaving the market.

In Finland electric energy can easily be put out to competitive tender through the web portal **www.sahkonhinta.fi** maintained by the Energy Market Authority. Over 2.5 million searches have been performed through the web portal, which means that several hundreds of thousands of Finns have compared energy prices. However, only about 4.0 per cent of Finnish electricity users switched their electricity suppliers in 2007. Most active have been those consumers who consume more than 10.000 kWh per year since 7 per cent of consumers in this category had changed their supplier in 2007.

At the time of liberalization of the Norwegian electricity market, most customers continued to stay with their local supplier with a standard variable contract (where prices can be changed on 2-3 weeks notice). Since the liberalization of the market NVE has closely monitored the market development in the Norwegian retail market. At the end of 2006, 28 per cent of the household customers and one third of the industry customers had another supplier than the original supplier. Since 1997 there has been almost 2.3 million supplier switches in the household market and at least half the Norwegian households have switched at least once. Furthermore, customers have switched away from the standard variable contract to spot related contracts. At the turn of the year 07/08 only 10 per cent of the industrial customers and 50 per cent of the household customers had standard variable contract. In Norway an estimated 198 600 households (9 % of the households) and 20 000 industry consumers switched supplier during 2007.

[11] Supplier switching in the Nordic countries, NordREG.

Approximately 8 per cent of the Swedish household customers switched electricity supplier in 2007. More customers switched their supplier in 2007 than in 2006. From December 2006 to December 2007, the number of household customers who had switched the supplier increased by 24 per cent. It is an increasing number of customers with a low annual consumption that are switching from one supplier to another.

7.3 Main players

The number of electricity suppliers in Denmark is close to 70 – trading companies with supply obligation companies and trading companies without such obligation. The about 35 supply obligation companies have each been granted a concession for a specific geographic region where they supply households and small businesses having not concluded an individual contract. More than 95 per cent of the Danish households and small businesses are supply obligation customers. The trading companies supply the rest of the market i.e. mainly larger businesses and enterprises. Among the largest trading companies in Denmark are Dong Energy A/S, Energi Danmark A/S and Scanenergi A/S.

The number of electricity suppliers in Sweden has fallen since the deregulation of the electricity market. In 1996 there were over 220 suppliers in Sweden. By 2007, this figure has fallen to 115. About 96 of these companies operate throughout the country. The decline in the numbers of electricity suppliers is mainly due to acquisitions and mergers.

In Finland the number of retail suppliers of electricity has remained at a relatively high level since the opening up of the market in the late 1990's. To serve Finland's circa 3,1 million electricity customers, there are currently more than 70 retail suppliers of which approximately a third market electricity actively outside their traditional supply area. In the Finnish electricity retail market there are about 5 electricity retailers with a larger than 5 per cent of share of market. The combined market share of the four largest suppliers in the retail market for small and medium-sized customers has been 35-40 per cent.

In Norway, there were 200 suppliers at the turn of 2007/2008. In 2007, the four largest household suppliers in Norway had about 40 per cent of the market.

7.4 Retail markets: Conclusions

Even though the work of integrating the Nordic retail markets has begun there are still four separate markets. Therefore, comparisons between the markets should be done with caution.

Active customers are essential for a well-functioning electricity market. The share of customers switching electricity supplier differs considerably between the Nordic countries; from app. 2 per cent in Denmark to 9 per cent in Norway (household customers).

NordREG's work towards a common Nordic retail market is of great importance to the Nordic electricity customers. Standardisation of the procedures and practices on supplier switching and agreeing on a common Nordic balance settlement would facilitate the work towards an integrated Nordic retail market. Possibility to choose between suppliers from all Nordic countries would most likely increase customer activity furthering innovation of new products, services and contracts. Increased customer activity would also mean a more competitive market leading to lower margins on the retail market to the benefit of the consumers.

8 Market indicators for the Nordic electricity markets

The Nordic Market Reports describes the status and development of the Nordic electricity markets. The report offers statistical information on the development of the Nordic market, description and data of the market structure and main players and information on the retail market.

A number of the data already in the market report can be seen as indicators of the markets in terms of competitiveness, function, structure etc. This goes for data such as supplier switching, market shares of largest market players and the like. However this data does not provide a comprehensive set of indicators in their present state.

In order to develop methods of quantitative evaluation and assessment of the developments and functioning of the markets as well as to enable comparative analysis etc., NordREG has undertaken the assignment to establish a number of statistical indicators for the functioning and status of the wholesale and retail markets. The indicators will be developed and sent to public consultation in fall 2008 in order to incorporate them in the Market Report 2009.

8.1 Possible indicators

As indicated above the work on developing the market indicators has just begun, hence it is not possible to identify or present them here in their final form. However, it is possible to list some of the conditions and relations which will be considered and analyzed in the coming work.

8.1.1 Retail market indicators

- Supplier switching ratio
- Smart meter ratio
- Product diversification on consumer market and number of customers/product
- Supplier margins
- Number of independent suppliers (suppliers not connected to grid companies etc.)/market shares (Hirschman-Herfindahl index)
- Consumer access to market information and assistance

8.1.2 Wholesale market indicators

- Price areas
- Market fragmentation (Market shares/Hirschman-Herfindahl index, increase in number of market players etc.)
- Third party access (unbundled grid operators, clear and public tariffs, easily enforceable rules on network access, easy and effective transfer of data etc.)
- Security of supply

9 Ongoing NordREG work

So far the report has provided a general presentation of the recent development of the Nordic electricity market based on NordREG's running electricity market monitoring. In addition, NordREG makes deeper analyses on market issues and proposes changes to facilitate market development and market integration.

Some of NordREG's most important projects are presented in this chapter based on conclusions drawn in NordREG's reports published in 2007. The descriptions are organised according to NordREG's strategic priorities:

- A truly common Nordic retail market with free choice of supplier
- A well-functioning Nordic wholesale market with competitive prices
- Reliable supply
- Efficient regulation of TSOs

9.1 A truly common Nordic retail market with free choice of supplier

This strategic priority was in 2007 addressed by the interrelated working-issues of "A common Nordic platform for balancing services" and "market design of the Nordic retail market". Harmonized balancing rules are an important precondition for integrating retail markets. NordREG evaluated the February 2007 Nordel agreement on balancing, which was found to constitute an appropriate basis for a comprehensive Nordic balancing system. However the final view will be reserved until more operational details are drafted. NordREG especially focuses on the costs of the system, on the incentives to make more market participants become balance responsible and in general on the ability of the system to promote competition.

A qualitative cost benefit analysis of introducing an integrated Nordic retail market indicates that benefits will most likely outweigh costs with a clear margin. The additional work on drafting a harmonized supplier switching model and addressing the functional separation of monopoly network activities as major elements in outlining a proposal for a harmonized market design progressed well during 2007 and will be finalized in the beginning of 2008.

9.2 A *well-functioning Nordic wholesale market with competitive prices*

The basic status of the functioning of the Nordic wholesale market is given in the 2007-version of "Nordic market Report", which was published in June 2007. The review relates to the year 2006. The year witnessed an efficient response in the market to the shift from a dry and warm summer to an autumn with high levels of precipitation. More than 60 per cent of electricity consumption was traded on Nord Pool Spot compared to around 45 per cent in 2005 and around 10 per cent back in 1997.

Nord Pool Spot, thus, is a most important vehicle for a well functioning Nordic wholesale market. In order to reflect the Nordic aspect of a power exchange formally governed by Norwegian legislation Norwegian regulatory authority in 2002 made guidelines for the cooperation of Nordic national regulatory authorities in relation to the regulation of Nord Pool

Spot. During 2007 NordREG carried out reflections on how this cooperative monitoring and regulation can be further developed.

The Nordic cooperation in the regulation power market is another important aspect of both a well functioning whole sale market and an appropriate level of security of supply. NordREG reviewed the functioning of this cooperation with a joint "bidding ladder" – all contacts to suppliers of regulation power (manually activated reserves) remaining with the national TSOs. The system obviously reaping a large share of potential benefits of Nordic cooperation on this issue, however, might benefit from increased harmonisation. NordREG calls for increased transparency of the system and will address more in detail the need for cooperation on monitoring.

9.3 Reliable supply

Another of NordREG's priorities is to contribute to reliable supply of electricity in the Nordic region. The roles of national regulatory authorities of the Nordic countries in relation to security of supply issues are very different. Other public authorities, too, have important responsibilities and in certain cases the responsibilities assigned to regulatory authorities are minor. NordREG during 2007 has been carrying out a review of the roles and responsibilities as well as of the legislation relevant to the issue. Based on this a NordREG report on cooperation between Nordic regulatory authorities and other competent authorities will be finalized in the beginning of 2008.

9.4 Efficient regulation of TSO

TSOs play a crucial role in the efficient operation of the market, especially the wholesale market. Therefore the strategic priorities of "efficient regulation of TSOs" and of "a well-functioning Nordic wholesale market with competitive prices" are closely linked.

A 2007 NordREG work described the regulation of TSOs in each Nordic country and concluded that the regulatory set-ups for TSOs in each Nordic country (not only primary but also secondary legislation) seem very alike, although supervision of tariffs is conducted differently to some extent. Harmonisation of the regulators' way of supervising and the regulators' actions vis-à-vis the TSOs may lead to more efficient functioning of the Nordic market. A review among stakeholders on their view on the TSOs' handling of tasks revealed a number of issues which, however, are already addressed by NordREG or Nordel.

A NordREG analysis initiated in 2006 and finalized at the beginning of 2007 reviews the use of market splitting, counter trade and reduction of interconnector capacity as congestion management tools in the Nordic countries. It calls for explicitly taking competition issues into account in the regulation of TSO activities increasing harmonization of the roles of Nordic regulatory authorities. The analysis stresses the importance of appropriate implementation of the new EU Congestion Management Guidelines. In accordance with the efforts of the ERGEG Regional Initiative of North Europe it stresses the need to take into account the interface with continental Europe.

Implementation of the new EU Congestion Management Guidelines was more specifically addressed in a follow-up study during 2007. While the use of implicit auctions as the method to manage congestions in the Nordic countries fully complies with the Guidelines, more transparency in the use of reduction of interconnector capacity as a congestion management

tool is called for. The TSOs in addition are encouraged to increase mutual co-ordination and information exchange as well as publication of relevant information to market participants in a fully non discriminatory way. In addition to such efforts to optimize the use of the present transmission system necessary new transmission investments should be promoted through increasingly coordinated planning and by monitoring of the use of congestion income by the regulatory authorities.

The NordREG work in 2007 was based on a number of working groups for the tasks outlined in the Work Programme. The work included important dialogues with Nordel, Nord Pool Spot, the Electricity Market Group of Nordic Council of Ministers, Nordenergi and other institutions, in some cases in the form of topical workshops. Draft reports were subject to public consultations prior to publication.

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