

TASK XIII: MARKETPLACE OVERVIEW

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Section I: Electric Industry

- 1. Does your country operate as one national electricity marketplace or do you have multiple regional electricity marketplaces?**

The Nordic power exchange Nord Pool is the common market place of Norway, Sweden, Denmark and Finland. The Nord Pool products include both the day ahead market (Elspot) and financial trading (forward/future and options). In addition bilateral contracts are traded directly between the market players or via commercial traders.

There are no special charges for trade between the countries.

- 2. If you have multiple regional marketplaces, how many exist in your country? Please explain.**

Apart from minor market places for bilateral trading Norway does not have multiple regional marketplaces. However, Norwegian market players are active actors on the power exchanges in central Europe, as players from Central Europe are allowed to participate in the Nord Pool markets.

**3. What market actors perform the following functions in your marketplace:
(Please list and briefly describe)**

a. Generation:

In Norway almost all electrical power is generated by hydroelectric power stations. Average annual production is 118 TWh. A total of 156 companies are engaged in electricity generation in Norway today. Of these, 29 are companies whose operations are confined to electricity generation. The state owned Statkraft is the largest producer in Norway with approx. 40 % of the total production.

b. Transmission:

The Norwegian Transmission System Operator (TSO), Statnett SF, is responsible for construction and operation of the transmission system (Central Grid). Statnett owns about 87 per cent of the central grid. Furthermore, Statnett is responsible for short- and long-term system planning and the grid and coordinates the real time operation of the Norwegian power system from the national control center.

Additionally Statnett plays the central role in the development and operation of transmission connections with the neighboring countries and must therefore cooperate closely with the system operators in the other Nordic countries. This cooperation is an important basis for the Nordic power market. The Nordel organization is the body for cooperation between the Nordic TSOs.

c. Distribution:

The Norwegian distribution companies own the local distribution systems, parts of the regional grid. Of a total of 178 distribution companies, ~75 % are also engaged in electricity generation and/or trading. One or more municipalities wholly or partly own most of the distribution companies.

d. Retail customer services:

The market players who sell electricity to the consumers are in Norway called suppliers. A supplier can be a producer or a trader who buys the electricity from the power exchange (Nord Pool) or on bilateral basis.

Norway has in principle had full retail access from deregulation in 1991. From 1998 all customers can change supplier every week if they want to. Change of supplier is a simple process, mainly involving conveying the necessary information to the new supplier. Price information is readily provided on the Internet by the competition authorities. Change of suppliers has increased

significantly the last years, from ~30 000 changes/year in 1998 to presently ~300 000 changes/year (16 %).

e. Reliability management:

As a transmission system operator Statnett is responsible for the system safety of the Norwegian power system in the short and long term.

f. Other (please describe):

Power brokers do not buy power themselves, but negotiate market-based offers and establish contact between buyers and sellers. Brokering activities do not require a trading licence.

4. What market actors' work directly with the retail consumers (e.g. distribution company, competitive suppliers, energy service companies, etc)? Please provide brief description of their roles.

Retail consumers receive services from a number of different entities. The consumer could receive commodity service from a competitive supplier and distribution services from the local utility. Billing services may be bundled with one of these two firms or it might be provided from both of them separately. There are a lot of various energy service companies. These firms provide things like lighting, HVAC, energy efficiency equipment. A few utilities and competitive suppliers offer these services as well.

5. Please list key regulatory players and their roles.

The Ministry of Petroleum and Energy has the overall regulatory responsibility for the electricity sector.

The Norwegian Water Resources and Energy Directorate (NVE) is a subordinate agency of the Ministry of Petroleum and Energy and is responsible for administration of Norway's water and energy resources. The NVE has the regulatory authority to grant trading licences for electrical power and construction licences, and to stipulate system operator guidelines. The NVE also stipulates guidelines for transmission tariffs and sets the revenue ceilings for the grid companies – including Statnett. The latter entails a duty to increase the efficiency of natural monopolies.

Enova SF, that was founded June 2001 is a second subordinate agency of the Ministry of Petroleum and Energy. Enova's tasks are to promote more efficient energy use, the production of new renewable energy and environmentally-sound uses of natural gas. Enova offers subsidies to actors (energy efficiency companies) in Norway that perform energy efficiency services. There are a lot of various energy service companies. Enova SF works with a broad network of players in all sectors of the economy, including

decision-makers in commerce and industry, end-users, municipalities and other public sector and regulatory bodies. Its role is to strengthen the links between the various groups of actors, to coordinate project development and improving the effectiveness of public action in the energy area.

6. Please list key industry stakeholder groups (e.g. large customer associations, reliability organizations, trade associations, etc.)

The regulator: The Norwegian Water Resources and Energy Directorate (NVE) / ENOVA

TSO: Statnett SF

Large customers

Norwegian Electricity Industry Association (EBL)

Producers and traders

Distribution Companies

7. How many commercial, industrial and residential customers exist in your marketplace (add additional customer classes, e.g. agricultural, as needed)?

| Customer Class | Number of Customers | Summer Peak Demand (MW) | Winter Peak Demand (MW) | Annual MWHs |
|----------------|---------------------|-------------------------|-------------------------|---------------|
| Commercial | ~ 260 000 | ? | 6 000 (26 %) | 25 800 (21 %) |
| Industrial | ? | ? | 5 750 (25 %) | 56 500 (46 %) |
| Residential | ~2 000 000 | ? | 6 700 (29 %) | 38 100 (31 %) |
| Others | | | 4 600 (20 %) | 2 600 (2 %) |
| | | | | |
| Σ2001 | | | 23 050 | 123 000 |

8. How many distribution companies operate in your marketplace? Please list the top five largest distribution companies.

Number of Distribution Companies (in 2002): 178

| Largest Distribution Companies | Number of Customers | Summer Peak Demand [MW] | Winter Peak Demand [MW] | Quantity transmitted [GWh/year] |
|---------------------------------------|----------------------------|--------------------------------|--------------------------------|--|
| Hafslund Nett | 525.000 | ? | 3.900 | 14 920 |
| BKK Nett | 172.200 | ? | ? | 4 495 |
| Lyse Nett | 102.000 | ? | ? | 3 632 |
| TEV | 85.000 | ? | ? | 2 205 |
| NTE | 75.000 | ? | ? | 1 973 |

9. If you have retail competition, how many competitive suppliers exist in your marketplace?

Currently, about 30 suppliers offer electrical energy to all customers in Norway. The rest, ~50 suppliers, only compete in the local area.

10. If you have retail competition, what percentage of the summer and winter peak demands do competitive suppliers supply?

?

11. What is the forecasted peak demand growth rate in your marketplace?

250 –350 MW/year (1-1,5 %)

12. What is the projected supply (capacity) growth rate in your marketplace?

~100 MW/year (0, 5 %)

Section II: Demand Response

13. Has demand response been attempted in your market? If so, please provide brief description of relevant successes and challenges.

The Norwegian TSO, Statnett, has been the most active part with regard to demand response in Norway. Due to shortage of reserves in the regulation power market 1999/2000, Statnett established the option market for reserves (RCOM) from 2001. This market, which implies a firm payment for availability, has led to a growing interest from the end user side.

Statnett also utilize demand response for reliability purposes, referred to criteria like low frequency and low voltage.

The power exchange, Nord Pool, has expressed interest in promoting a more efficient market by giving incentives to more price elasticity on the demand side. So far the demand curves have been quite steep. New demand side bidding options are offered in order to improve the possibility to give price flexible bids.

Demand response has in addition been subject for some test and research projects.

14. Which market actors might be most supportive of demand response in your marketplace? Please explain why.

The Market Operator (Nord Pool) and the TSO (Statnett) want more demand side participation in the day ahead and the balancing markets. A more efficient market is the main goal. The TSO also wants to contract reducible loads for reliability purposes.

Some distribution companies are facing bottlenecks and need for investment in new transmission capacity in their local grid. Contract for load reduction for customers behind the congested line or transformer might be a profitable option for these companies.

Some suppliers have shown interest in demand response schemes as a means to reduce their risk in periods with unexpected high spot prices.

15. Which market actors would be the most likely to offer demand response services to the consumer? Please explain why.

The larger customers who have access to the power exchange (Nord Pool) and the regulation power market will offer their potential load reduction themselves.

Both suppliers and distribution companies are potential aggregators of minor reducible loads, which can be bid into the physical markets.

So far only one independent “agent” operates as an aggregator of demand response in Norway.

16. Can demand response resources participate in electric market transactions today? If so, how?

DRR can participate in the day ahead market (Elspot) and the balancing market (Regulatory Power Market and Regulatory Capacity Option Market (RCOM)). Additionally, all distribution companies’ offer reduced network tariffs to customers with interruptible loads due to unload the distribution network. To day back-up system is required to make use of such tariffs, but several distribution companies are looking into offering reduced network tariffs to customers with in interruptible loads in limited time periods.

17. What are the most important objectives for demand response? Please explain.

There are several objectives for demand response, dependent of the different market players’ interest. From a socio economic view utilization of reducible loads as an alternative to investments in new production and/or new power lines is the most important objective.

18. Do energy consumers see different electricity prices at different times of the day? (Please explain in terms of how many and by class or size)

The energy consumers who are players on the Nord Pool follow the hourly spot prices (but so far hourly bidding from the demand side is limited).

All consumers with yearly consumption above 100 000 kWh, ~60 % of the total consumption, will be hourly metered from January 05. All these consumers can in principle be offered hourly spot price energy contracts. But so far quite few have such contracts, which mean that the attention of the daily variation of the spot prices is limited.

Network tariffs presently offered to consumers in Norway does not vary on daily basis. ToU tariffs with interday variation are only applied in test projects.

19. Have any energy efficiency and/or a demand response market potential studies been completed in your marketplace in the last ten years? YES / NO

If yes, please provide a reference location or attach the report.

Yes. The potential of demand response (load reduction on hourly basis with up to 4 hours duration) in the "Power intensive Industry " and in the domestic sector were investigated in the project "End User Market" (1996-2001). Documentation in Norwegian only.

Section III: Market Transactions

20. What type of electricity products traded in your marketplace (e.g. 5-minute spinning reserve, 30-minute non-spin, day ahead, capacity, hourly energy/spot, etc.)?

The power exchange Nord Pool is the operator of the Elspot Market and the TSO, Statnett, operates the Regulation Power Market (balancing market). These two markets are often called the physical markets:

Elspot:

In the Elspot market prices for sales and purchases are determined hourly at noon every day for the next 24 hours (starting at midnight). The hourly prices are calculated as the intersection between the demand and the supply curve. A common system price is calculated for the common Nordic market. Separate area prices, based on the bids in predefined areas, are calculated in case of congestion.

The Regulation Power Market:

This "balancing" market is a tool that the system operator in Norway (Statnett SF) uses to maintain a stable frequency and a continuous balance between production and consumption of power in the country. The balancing market opens after prices and quantities have been determined in the Elspot market. Statnett receives quotes from major producers or consumers that are willing to alter their power generation and/or consumption plans at short notice. When frequency deviation occurs, Statnett calls the units available on the list for up or down regulation and these units have to respond within 15 minutes. The regulation price is determined as the price of the last unit used.

Statnett also utilizes reducible loads as "network protection" in case of low frequency or low voltage. The loads in question are included in a special contract regarding system services.

21. Do you have a central trading exchange in your marketplace?

Nord Pool is the common power exchange for the Nordic countries. Nord Pool organizes four markets: Elspot and the financial products Eltermin, Elbas and Eloptions. Nord Pool also offers clearing services for the power market.

22. How are reserve margin targets established in your marketplace? Please explain.

The reserve margin is determined by the TSO, based on the recommendations from the Nordel organization. These recommendations says that each of the Nordic countries is obliged to keep a minimum of instantaneous, fast and slow reserves. The total need for spinning reserves in the Nordic system is determined by the “dimensioning failure”, which is tripping of the largest generator in operation.

The market players contribute to the reserves via the system service agreement and by bidding free capacity or reducible loads into the regulating power market.

23. What is the current reserve margin target in your marketplace?

The reserves obligations are distributed between the Nordic TSOs. The following is presently applicable in Norway:

Instantaneous reserves: 313 MW

Slow reserves: 2000 MW (included forecast uncertainty)

24. Does your market currently exceed or fall short of the current reserve margin target? Please explain.

Statnett seems to keep the reserve margins under control, partly as a result of the success with the option market for reserves (RCOM).