National Report 2014

Norwegian Water Resources and Energy Directorate (NVE)

The data/content refer to 31 December 2013 or
the reporting period 2013 unless otherwise stated.

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1 FOREWORD

The Norwegian electricity market was formally opened up for competition when the Energy Act came into force the 1st of January 1991. The regulatory tasks are ensured by the Norwegian Water Resources and Energy Directorate (NVE). A regulatory office (department in NVE) was set up in 1990. As electricity regulator, NVE has played an active role in developing network regulation, real market access for all customers, easy procedures for supplier switching, security and quality of supply and efficient regulation of system operation.

The development of the Norwegian market has been successively followed by similar market opening in the other Nordic countries with a common Swedish-Norwegian wholesale market already from 1996. From early 2000 all the Nordic countries were included in the common market place, and from 2013, the Baltic countries are also part of an open and integrated electricity market with one power exchange. The Nordic/Baltic market is well interconnected with several interconnectors to the continental European market as well as to Russia.

Norway is member of EFTA and a party to the European Economic Area agreement (EEA). As a consequence of this, the EEA procedures regarding adoption of new EU directives apply for Norway. The electricity directive 2003/54/EC and Regulation 1228/2003 passed through the EEA Committee in December 2005. This report is based on the reporting requirements in the directive 2003/54/EC articles 3(9), 4 and 23 (1 and 8), and directive 2005/89/EC article 7.

NVE is a member of Council of European Energy Regulators (CEER). NVE has in 2013 continued its work with the goal that NVE should be included in the Agency for the Cooperation of Energy Regulators (ACER). This will be decided as part of the EEA process related to the third energy market package. The third package is expected to be implemented in Norway after the EEA joint committee decision and subsequent approval by the Parliament.

This report follows the common reporting structure created by the Commission and CEER. This report, together with the national reports of member states, will be available on the website of the CEER:
www.ceer.eu

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2 MAIN DEVELOPMENTS IN THE ELECTRICITY MARKETS

Introduction – about NVE

The main statutory objectives for NVE concerning energy, and which the regulatory functions are a part of, is to promote social and economic development through efficient and environmentally sound energy production, and promote efficient and reliable transmission, distribution, trade and efficient use of energy.

For NVE, both for regulatory tasks as well as for other tasks, the responsibility and field of work are defined in law, regulations and decisions from the Parliament and Government and in the annual allocation letter from the Ministry of Petroleum and Energy.

NVE is delegated powers pursuant to the Energy Act. NVE has powers to issue regulations on economic and technical reporting, network revenues, market access and network tariffs, non-discriminatory behaviour, customer information, metering, settlement and billing and the organized physical power exchange (Nord Pool Spot). As well as issuing regulations on system responsibility and quality of supply. NVE can take necessary decisions to fulfill the delegated powers pursuant to the Energy Act.

NVE is the national independent regulatory authority for the electricity market in Norway. The Director General acts as regulator. NVE has no ownership interests in the electricity industry and is independent from the economic interests in the electricity industry. NVE is an independent legal entity with its own budget adopted by Parliament and power to act in the scope of its competences. In 2013, a new department was established to prepare for the implementation of the Third Energy Market Package.

There is a cooperation agreement between NVE, the Competition Authority (concerning i.a. mergers and market surveillance) and the Financial Supervisory Authority of Norway (concerning the financial markets for electricity derivatives). NVE also has a cooperation agreement with The Directorate for Civil Protection and Emergency Planning.

Less hydro resources increased prices

The Nordic electricity system has a high share of hydro generation, thus the Nordic electricity price is influenced i.a. by the hydrological situation. 2013 was a dryer year than 2012 in terms of inflow to the reservoirs. This contributed to an annual increase in the average system price by 22 percent from 2012 to 38.10 Euro/MWh in 2013. The year of 2013 started with normal reservoir levels. This is 9,7 percentage units lower than the record high levels from 2012. This indicates more scarcity of energy in 2013 in comparison to 2012, and is a contributing factor to higher prices. The highest monthly system price in 2013 of 45.62 Euro /MWh occurred in April, due to a cold snap that increased consumption and delayed snow melting.

The five Norwegian elspot area prices correlated highly with the system price development. There were an increase of prices in all 5 Norwegian bidding zones in 2013 compared to 2012. The increases varied from 24 percent to 30 percent. In the period from mid August to mid October, grid works caused congestion that lead to price differences between South (NO1, NO2 and NO5) and North (NO3 and NO4) Norway. The unavailability on the interconnections from Eastern Norway (NO1) and SE3 (Mid-Southern Sweden) and South West Norway (NO2) and the Netherlands contributed to a “lock-in” effect of power

in South West Norway (NO2). Therefore, the prices in the South of Norway (NO1, NO2 and NO5) did not rise as much as surrounding elspot areas (NO3, NO4 and Sweden).

Border change between elspot areas

Since 2010 there has been five elspot areas in Norway. The background for establishing a new elspot area, NO5, in March 2010 was the foreseen energy deficit area in Western part of Norway, where the city Bergen is located. The elspot area NO5 was also meant to bring down congestion management costs, by reducing the amount of counter trade. The area NO5 has been useful to handle congestions during surplus situations, especially in periods with high production in small scale hydro power plants with low reservoir capacity.

In December 2013, the 420 kV Sima-Samnanger line between the elspot areas Eastern (NO1) and Western (NO5) Norway was commissioned . TSO Statnett's assessment was that import capacity after the commissioning of Sima-Samnanger is high enough to avoid an energy deficit situation. With the Sima-Samnanger line, the congestion was expected to occur closer to the Oslo region. Consequently, the border between the elspot areas Eastern (NO1) and Western (NO5) Norway was changed accordingly on December 6th 2013.

The border change led to that about 4100 MW of installed production capacity changed elspot area from NO1 to NO5. The maximum net transfer capacity (NTC) from NO5 to NO1 increased from 700 MW to 3500 MW, while in the direction NO1 to NO5, the max NTC decreased from 650 MW to 300 MW.

Tightening of the power situation in the snow-melting season

Cold weather in late March and early April increased consumption and delayed the snow melting such that the inflow to the hydro reservoirs was delayed. Both of these effects had a negative effect on the energy balance and thus the outlook on security of supply.

From April 9th to May 15th of 2013 the power situation was denoted as “pressed” by TSO Statnett in Mid (NO3) Western (NO5), and parts of South West Norway (NO2). The probability of electricity rationing was estimated to be between 5 and 20 percent by the Statnett according to its classification of a “pressed” power balance.

NVE initiated an increased monitoring of hydro reservoir levels during this period. By May 15, the power situation recovered by reduced consumption and sufficient snow melting due to warmer weather.

NPS’ lack of price calculation of the day-ahead market

In early August 2013, for the first time in its near 20 year history, NPS struggled to determine market results[1]. Due to a technical problem, the price setting algorithm did not yield any result within the normal and extended time frame. At 20.00 NPS had to declare a ‘no price situation’ and reverted to the fall back procedure described in the NPS Rule Book. During the incident, NPS had continuous communication with the TSOs and published frequent information to the market.

[1] The market results consist of the day-ahead prices (system price and elspot area prices), power flows and volumes.

NVE deems lack of prices a serious occurrence, however notes that NPS followed the Rule Book and ensured information to the market and to the TSOs during the incident. Furthermore, NPS efficiently identified and dealt with the technical problem causing the incident, and NVE was quickly assured that NPS had taken every necessary step to ensure that a re-occurrence would not take place. Robust and reliable price setting is fundamental to a well-functioning market, and NVE has confidence that NPS fulfills the role of a robust market place.

Implementation of a smart metering and establishment of a national point of data management

The Norwegian retail market for electricity is set to undergo substantial structural changes in the coming years, as part of the goal to further increase competition and efficiency in the market. The implementation of smart metering by 2019, and the creation of a national point of data management (Elhub) will be the focal points of these changes, and will make the exchange of information in the retail market more efficient. Smart meters are expected to give incentives for increased energy efficiency and peak load management, by providing detailed feedback on consumption to consumers. NVE considers the facilitation of active, well-informed consumer behaviour to be a key challenge for the Norwegian retail market. The implementation of Elhub will standardise the exchange of hourly metering data, simplifying the communication of metering data in the chain between DSOs, suppliers and consumers.

NVE is also considering a supplier centric model for the Norwegian retail market, in accordance with NordReg recommendations. The implementation of a supplier centric model is key to the agreed harmonisation of legislation necessary to create a common Nordic retail market for electricity. The model under consideration by NVE centres on a combined billing regime, which aims to simplify the market structure and increase consumers' understanding of the electricity market. NVE expects a supplier centric model to reduce switching barriers. In 2013, NVE spent a significant amount of time preparing new regulation for these future changes.

Increased incentives for investments in the economic regulation of electricity grids

The model for economic regulation of electricity grids is frequently reviewed to adapt to new circumstances and to improve effectiveness. Norway is facing an intensified investment period at all grid levels after a long period of efficiency improvement and low investment activity.

In 2013, several changes in the regulatory model were implemented to achieve more stable and predictable revenue caps and give better incentives for necessary investments. The model where revised in order to achieve more stable revenue caps, by changing the "frontier" in the DEA[2] models which all companies are compared with. The "frontier" consists of the companies solving their tasks in the most cost efficient way, identified by using the latest year costs and outputs. This makes the "frontier" and DEA results vulnerable to relatively large annual variations in some cost elements, such as pension costs, CENS[3] and network losses. To minimize these volatility challenges in the DEA results, NVE decided to use a "frontier" based on 5-years average of the companies' costs and outputs. Still, each company's costs and outputs from last year is used in the evaluation against this "average-front", and yearly variations affects the DEA results, which is intended. In addition, new high quality data for operating environments

[2] DEA – Data Envelopment Analysis, a method of measuring efficiency by comparison of utilities
[3] CENS – Costs of Energy Not Supplied, the customers value of lost load due to power supply interruptions

and a new and improved methodology for adjusting the DEA-results for these factors, increased the accuracy in the model from 2013.

To stimulate the network industry to increase their research and development (R&D) activities, especially related to smart grids, NVE included a special treatment of R&D costs in the economic regulation from 2013. Prior to this, such costs were treated as any other costs and subject to benchmarking, as is common in regulatory regimes in Europe. The new method allows for passing through costs from R&D projects, including pilots, that aims at contributing to an efficient operation, utilization and development of the network. The projects have to be recommended by the Norwegian Research Council or similar institutions, and the costs that can be passed through are limited to 0.3 percent of the company's regulatory asset base. 16 projects were approved in 2013. Several of the network companies take part in more than one project: in total 31 companies were engaged in the 16 projects.

The expected return on investments is a key driver for investment decisions in the network companies. NVE reviewed in 2012 the WACC[4] model used to estimate the network companies cost of capital since 2007, to ensure that desired investments will be carried through. The financial crisis had durable impact on the parameters in the model used from 2007, resulting in a need for amendments. Therefore, a new model was implemented from 2013 as a solution to the new situation and it is expected to be more sustainable than the previous. In the new WACC, the tradition of using the interest rate on government bonds as reference for a risk free investment in both cost of equity and cost of debt was ended. Instead, a fixed risk free rate of 2.5 percent adjusted for inflation and a risk premium amounts to the cost of equity. Observed swap-rates and credit spreads are used to estimate the cost of debt. The risk premium was increased by adjusting the market premium from 4 to 5 percent.

[4] WACC – Weighted Average Cost of Capital

3 THE ELECTRICITY MARKET

3.1 Network regulation

3.1.1 *Unbundling*

There were no changes in the unbundling requirements for the Norwegian network companies in 2013. The Norwegian practice of legal unbundling is stricter than the requirement in the electricity directive 2003/54/EC. While the directive enables undertakings performing functions of generation or supply to own undertakings performing activities of transmission or distribution, the Norwegian Energy Act requires that the undertakings performing functions subjected to competition, such as generation or supply, can not own undertakings performing the activity of transmission or distribution, and vice versa.[5]

In Norway there is only one TSO - the publicly owned Statnett. Statnett has been legally unbundled since 1992 and has to comply with the ordinary functional provisions. Further, Statnett and the publicly owned electricity generator, Statkraft, have since 2002 been owned by two different government ministries, thus complying with requirements for ownership unbundling.

DSOs with more than 100 000 connected customers in Norway are legally and functionally unbundled. In 2013 this amounted to eight DSOs, covering approximately 60 percent of the total mass of connected customers. In addition to the unbundling requirements, these companies are obliged to participate in a compliance programme in accordance with the electricity directive. The participants of the programme are obliged to provide a yearly report to NVE, and this report functions as a device for NVE to monitor the DSOs fulfilment of the regulations regarding legal and functional unbundling.

148 of the Norwegian DSOs have less than 100 000 connected customers, and are therefore exempted from the regulations regarding legally unbundling. However, in the event of a merger or acquisition that triggers the obligation to acquire a trading license, NVE can require a vertically integrated company performing generation or supply in addition to distribution, to reorganize into separate legal entities. In addition to the eight DSOs with more than 100 000 customers, there are 33 legally unbundled DSOs.[6] All 156 DSOs are under regulations concerning neutral and non-discriminatory behaviour when it comes to the DSO's management of the information to customers, supplier switching, metering data and billing, and these regulations are subject to supervision by NVE. The majority of the Norwegian DSOs is publicly owned.

3.1.2 *Technical functioning*

Quality of electricity supply

NVE has wide legal powers as regards quality of electricity supply regulation. This includes setting requirements for all parties connected to the Norwegian power system including network companies, the

[5] DSOs with less than 100 000 connected customers are exempt from this requirement.

[6] *Legally unbundled DSO* means a DSO that is either organised as a subsidiary within a corporation with a parent company not engaged in any business requiring a trading license and activities subject to competition (generation, energy trade and/or supply) organized in a separate subsidiary, or a DSO where neither owner nor subsidiaries perform any activities subjected to competition (generation, energy trade and/or supply).

TSO, power producers and end-users regardless of whether they hold a license according to the Energy Act or not.

Voltage Quality

The Norwegian Quality of Supply Regulation includes minimum requirements for the voltage frequency, slow supply voltage variations, voltage dips, voltage swells, rapid voltage changes, flicker, voltage unbalance, and harmonic voltages. NVE has the legal power to set minimum requirements for other voltage disturbances as well, such as transient overvoltages, interharmonic voltages and mains signalling voltages, if and when considered necessary.

Interruptions

NVE publishes annually statistical report on interruptions providing continuity of supply levels at country level, county level, company level and end-user level. Only incidents at voltage levels above 1 kV are reported (incidents at voltage levels below 1 kV will be included from 2014).

The TSO, Statnett, publishes annually operational disturbance statistic report providing reliability levels for the system.

In Norway, network companies have been obliged to report specific data on interruptions since 1995. From the start, the data were reported with reference to so-called *reporting points* in the network. A *reporting point* is a distribution transformer or an end-user connected above 1 kV. NVE used the energy not supplied as input to the incentive based regulation on continuity of supply from 2001. For energy not supplied the exact number of customers is not important, but more separating for various end-user and customer groups. The end-users are categorized into 36 different groups.

From 2005, the interruption data are also referred to end-users. This was important to introduce due to two main reasons (1) easier to understand for non-technical customers and (2) better possibility to compare with other countries.

The reported data can be summarized as follows for *long and short interruptions starting from 1995 and 2006 respectively*.

- Number (ref reporting point + ref end user from 2005)
- Duration (ref reporting point + ref end user from 2005)
- Interrupted power (from 2006)
- Energy not supplied (ENS)
- SAIDI, SAIFI, CAIDI, CTAIDI, CAIFI (from 2005)
- Notified and non-notified

Common indices with reference to customers are presented in the table as regards long (tab 1) and short (tab 2) interruptions. The indices have the following description:

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- SAIFI: System average interruption frequency index (average number of interruptions per end user)
- CAIFI: Customer average interruption frequency index (average number of interruptions per affected end user)
- SAIDI: System average interruption duration index (average duration per end user)
- CAIDI: Customer average interruption duration index (average duration per interruption)

- CTAIDI: Customer total average interruption duration index (average duration per affected end user)

	SAIDI [hours]	SAIFI	CTAIDI [hours]	CAIDI [hours]	CAIFI
2005	2.3	1.9	2.9	1.2	2.4
2006	2.6	2.1	4.6	1.3	3.4
2007	2.4	2.0	3.6	1.2	3.1
2008	2.5	2.1	3.9	1.2	3.3
2009	2.0	1.8	3.2	1.1	2.9
2010	1.7	1.6	2.8	1.1	2.6
2011	4.3	2.7	6.5	1.6	4.1
2012	1.8	1.6	3.1	1.1	2.9
2013	3.0	2.2	4.8	1.4	3.5

Table 1. Continuity of supply indices with reference to the end users as regards long interruptions in Norway

	SAIDI [minutes]	SAIFI	CTAIDI [minutes]	CAIDI [minutes]	CAIFI
2006	1.4	1.8	3.0	0.8	3.8
2007	1.4	1.9	3.0	0.8	3.9
2008	1.7	2.1	3.3	0.8	4.3
2009	1.2	1.8	2.6	0.7	3.8
2010	1.0	1.4	2.4	0.7	3.4
2011	1.8	2.6	3.3	0.7	4.8
2012	1.3	1.6	2.9	0.8	3.8
2013	1.6	2.0	3.2	0.8	4.2

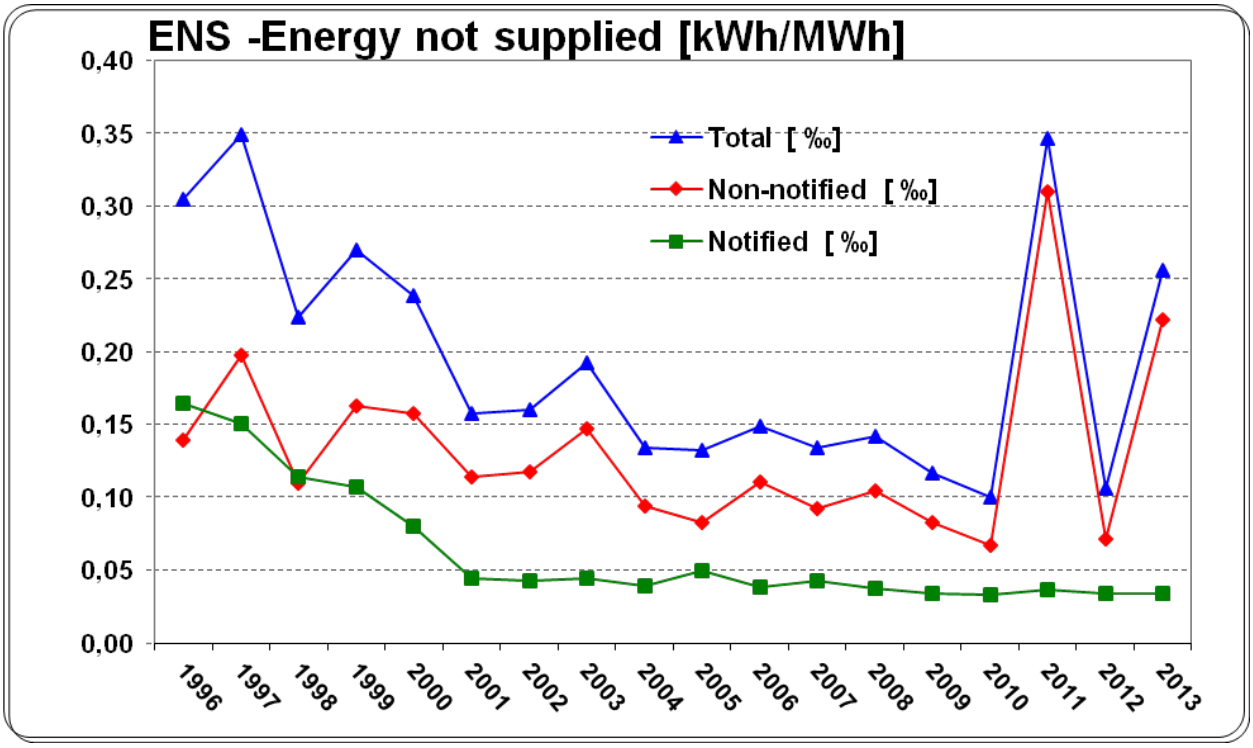
Table 2. Continuity of supply indices with reference to the end users as regards short interruptions in Norway

Reported “Energy not supplied”, is up to 2008 divided into 27 end user groups. From 2009 the number of end-user groups has been extended to 36.

Year	Energy supplied GWh	Energy not supplied - notified interruptions GWh	Energy not supplied - non-notified interruptions GWh	Energy not supplied in total GWh
1996	98 571	16.8	15.8	32.6
1997	101 987	16.5	24.0	40.5
1998	106 228	13.9	13.6	27.6
1999	106 525	11.8	19.0	30.8
2000	104 193	8.9	18.1	27.0
2001	108 361	5.1	14.2	19.3
2002	107 656	4.9	15.0	19.9
2003	105 145	4.9	16.9	21.8
2004	109 306	4.4	11.6	16.0
2005	111 804	5.7	9.9	15.6
2006	106 380	4.1	11.7	15.8
2007	109 712	4.7	10.1	14.8
2008	109 570	4.2	11.4	15.6
2009	107 052	3.6	8.9	12.6
2010	111 041	3.7	7.5	11.2
2011	107 055	4.0	33.2	37.2
2012	110 698	3.8	8.0	11.8
2013	112 118	3,8	24,7	28,6

Table 3. Energy supplied and some continuity indicators in Norway, as regards long interruptions

Figure 1 shows the development of energy not supplied in per thousand of energy supplied for the last 17 years in Norway.



Figur 1. Energy not supplied (ENS) in per thousand of the energy supplied (ES) to end users in Norway since 1996

In 2003, 2006, 2011 and 2013, several hurricanes caused a high amount of energy not supplied. For 2013, two hurricanes in November and December affected a large number of network-customers in Norway; 126 300 customers lost their power supply for more than one hour, 21 000 for more than 24 hours.

Balancing market and balance settlement

The Norwegian TSO, Statnett, holds a license as the system operations responsible, which obliges Statnett to ensure physical balance between power production and consumption in the operational hour. An important instrument for Statnett in this respect is the Nordic balancing market.

Norway is a part of an integrated Nordic balancing market, known as "the Nordic regulation power market". The Nordic TSOs operate collectively the Nordic area as if it were a single control area. The Nordic area is synchronized. The Nordic balancing market for manually activated reserves shares a common merit order, where the most efficient resources are utilized for up or down regulation. Generators and large consumers can submit bids to provide the TSOs with regulating power to balance the system.

The regulation power price varies around the elspot price (day ahead). In periods with up-regulation the regulation price will typically be above the spot price, and vice versa in periods with down-regulation the regulation price will typically be below the spot price.

The Norwegian part of the Nordic regulation power market has about 20-30 active participants, of which about 15 are active on a daily basis. The regulation power market is relatively unconcentrated with a fair framework for competition. Through the national regulation of 7th May 2002 Nº 448 on the system

responsibility in the power system the TSO can – when it is obvious that the market is failing to set efficient prices within a limited geographical area – suspend offers on the regulating power market and make use of declared volumes at prevailing electricity spot prices for the area. In such situation the bidder shall be informed. This clause has not been used in 2013.

Through the national regulation of 7th May 2002 Nº 448 on the system responsibility in the power system, the TSO has the duty to at all times administer sufficient reserves in the power system. In order to achieve this Statnett has established an option market (RKOM) to make sure there are enough bidders in the regulation power market. The option market is valid during wintertime, typically from October to April. The option market applies on a weekly basis and on a seasonal basis. Participants in the option market are paid to make bids in the regulation power market.

Statnett is also given a license as the balance settlement responsible, which obliges Statnett to ensure the financial balance in the balancing market, by acting as a clearing house for the Norwegian part of the balancing market. The purpose with the balance settlement is to settle the differences between the executed trades against the actual input or offtakes from the power grid.

In 2009, the four Nordic countries implemented a common model for settlement of imbalances, a so-called one-and-a-half price settlement. According to this model, consumption balance are faced with a-one-price-settlement – only the regulating power price for their imbalance, whereas production balance are faced with two different prices in the settlement – elspot area price or regulating power price, depending on whether their imbalance increase or reduce the system balance.

During recent years NVE, in cooperation with Swedish regulatori, EI (Energimarknadsinspektionen) and the Finnish regulator EV (Energiavirasto), has worked with the TSOs to prepare for a common Nordic Balance Settlement (NBS) through a jointly held company. This would be an important stepping stone towards a common Nordic end-user market.

3.1.3 *Network tariffs for connection and access*

The electricity network is divided into three levels: the transmission grid (400kV-132kV), the regional distribution grid (132kV-33kV) and the local distribution grid (22kV-240V). Statnett is the only Transmission System Operator (TSO) and is responsible for the transmission tariffs. There is a total of 148 network companies owning and operating regional and/or distribution grid, some also owning parts of the transmission grid.

Revenue Cap model

NVE regulates the network companies using an incentive based revenue cap (RC) model. The RC is set annually, based on a yardstick formula of 40 percent cost recovery and 60 percent cost norm resulting from benchmarking exercises. There is a two-year lag on the cost data. The regulation model regards operators of all grids. Statnett is benchmarked with other European TSOs[7], while the other network operators are benchmarked in a model based on Data Envelopment Analysis (DEA): one model comparing companies operating in the regional distribution grid and one model comparing companies

[7] e3Grid 2012 European TSO Benchmarking Study

operating in the local distribution grid. The models take differences in network structure and operating environments into account.

NVE notifies the RC for the coming year in November and the network companies set the tariffs accordingly. All data, benchmarking results and revenue cap calculations are published on web each year. This increase the transparency of the methodology and data used in the calculation of RC. In principle, the only difference between the notified and the final RC for a year, is the actual prices, inflation and WACC that has to be estimated in the notification. In addition to this, however any errors in the companies' cost or technical data discovered after the notification, are corrected in the final RC.

Any changes in the rules and regulations will be subject to a public consultation, implemented before the RC-year begins and included in the notification to the network companies. Changes in the methodologies not stated in the regulation, are mainly subject to a consultation with affected parties, but are also publicly available on NVE's web site.

The RCs are calculated based on expected total costs using inflated cost data from two years back. The deviation between the expected total costs and the actual total costs of all companies in a year is included in the RC calculation two years later (e.g. the deviation between expected and actual costs for 2013 will be corrected in the RC for 2015). The total cost deviation is distributed among the companies using their share of the sectors total regulatory asset base. This mechanism does not apply to the regulation of Statnett.

Allowed Revenue

The companies set their tariffs based on their allowed revenue, which is the revenue cap, with addition for costs related to property tax and tariffs paid to other regulated grids. To remove the time-lag in the cost of capital recovery, the difference between actual cost of capital (depreciations and return on assets) in the RC year and the amounts from two years back that are included in the RC are added to the allowed revenues.

Further, any Costs of Energy Not Supplied (CENS) occurred during the year are deducted from the allowed revenues. CENS is a measure of the value of lost load for the customers. The CENS arrangement provides incentives to the network operators to maintain their assets properly and to carry through necessary investments to avoid power outages.

The revenue compliance is subject to regulatory control. Excess or deficit revenue for a given year is calculated as the difference between actual collected revenues and allowed revenues in a year. Actual collected revenues include tariff revenues from customers, congestion revenue and revenue from system operations. As revenue generated from congestions are considered to be part of Statnett's actual revenue, these revenues thereby reduces the base for tariffs that can be collected from Norwegian customers. However, costs related to removing congestion are also part of the tariff base, which implies that the congestion revenue is used to finance investments to eliminate congestion. NVE decides an excess/deficit revenue balance every year. The decision is made approximately one year after the RC is set, when the companies have reported their actual costs in the RC-year. The balance is to be adjusted towards zero over time, through tariff changes. Excess revenues must be reimbursed to the customers, while deficit revenues may be recovered.

According to the economic regulation of network companies, transactions within a vertically integrated company and transactions between network company and other companies in the same corporation needs

to be on market conditions. Further, the national regulator may impose a specific method for cost allocation between areas of operation in vertically integrated companies. NVE audits annually a selection of the companies to reveal any cross subsidies.

Changes in the regulatory model in 2013 – increased investment incentives

The regulatory model is frequently reviewed to adapt to new circumstances and to improve efficiency. Norway is facing an intensified investment period in all grid levels after a long period of efficiency improvement and low investment activity.

In 2013, several changes in the regulatory model were made to achieve more stable and predictable RCs and give better incentives for necessary investments. The RC model where revised in order to achieve more stable revenue caps, by changing the "frontier" in the DEA models which all companies are compared with. The "frontier" consists of the companies solving their tasks in the most cost efficient way, identified by using the latest year costs and outputs. This makes the frontier and DEA results vulnerable to relatively large annual variations in some cost elements, such as pension costs, CENS[8] and network losses. To minimize these volatility challenges in the DEA-results, NVE decided to use a "frontier" based on 5-years average of the companies' costs and outputs. Still, each company's costs and outputs from last year is used in the evaluation against this "average-front", and yearly variations affects the DEA results, which is intended. In addition, improved quality of data for operating environments and a new and improved methodology for adjusting the DEA results for these factors, increased the accuracy in the model from 2013.

To stimulate the network industry to increase their research and development (R&D) activities, especially related to smart grids, NVE included a special treatment of R&D costs in the RC-model from 2013. Prior to this, such costs were treated as any other costs and subject to benchmarking, as is common in regulatory regimes in Europe. The new method allows for passing through costs from R &D projects, including pilots, that aims at contributing to an efficient operation, utilization and development of the network. The projects have to be recommended by the Norwegian Research Council or similar institutions, and the costs that can be passed through are limited to 0.3 percent of the regulatory asset base for each company. 16 projects were approved in 2013. Several of the network companies take part in more than one project: in total 31 companies were engaged in the 16 projects.

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[8] CENS – Costs of Energy Not Supplied, the customers value of lost load due to power supply interruptions

Tariff determination

Given the expected allowed revenue for a year, based on the notified revenue cap, the network companies set the tariffs in their network. The principles for setting the tariffs are set by NVE and are the same for all network levels. The tariff consists of a usage-dependent component and a fixed component. In addition to the tariff, network companies may charge connection charge to cover the costs of new network connections.

For feeding energy into the network, the fixed component of the tariff is independent of the grid level of connection. The annual national fixed component was 1 €/MWh in 2013 (NOK 8, exchange rate € 1 = NOK 8). The procedure for setting network tariffs has remained unchanged since 2010.

Complaints and disputes regarding tariffs are handled and settled by NVE.

3.1.4 Cross-border issues

Allocation of capacity and congestion management

Through the national regulation of 7th May 2002 No 448 on the system responsibility in the power system, the TSO is granted duties and responsibilities regarding congestion management. The TSO shall establish bidding zones in order to handle structural congestions (defined by volume and duration) in the transmission grid. Further, the TSO shall establish bidding zones to handle expected scarcity of energy within a specific geographical area. Congestions within a bidding zone are solved by countertrading, i.e the TSO is using the balancing market reserves. In 2013, Norway was divided into five bidding zones. These bidding zones are NO1 Eastern Norway including Oslo, NO2 Southern Norway, NO3 Middle Norway including Trondheim and Molde, NO4 Northern Norway, and NO5 Western Norway including Bergen.

The Nordic TSOs shall determine the maximum available trading capacity (trading limits) between the Nordic bidding zones according to the Net Transfer Capacity (ATC) method. The Nordic power exchange, NPS, publishes available transfer capacities to the market, (trading limits), between all bidding zones within the Nordic/Baltic area and on the interconnectors between the Nordic and the Continent at 10:00 in the morning before the day of operation, i.e. before gate closure of Day Ahead market at noon.

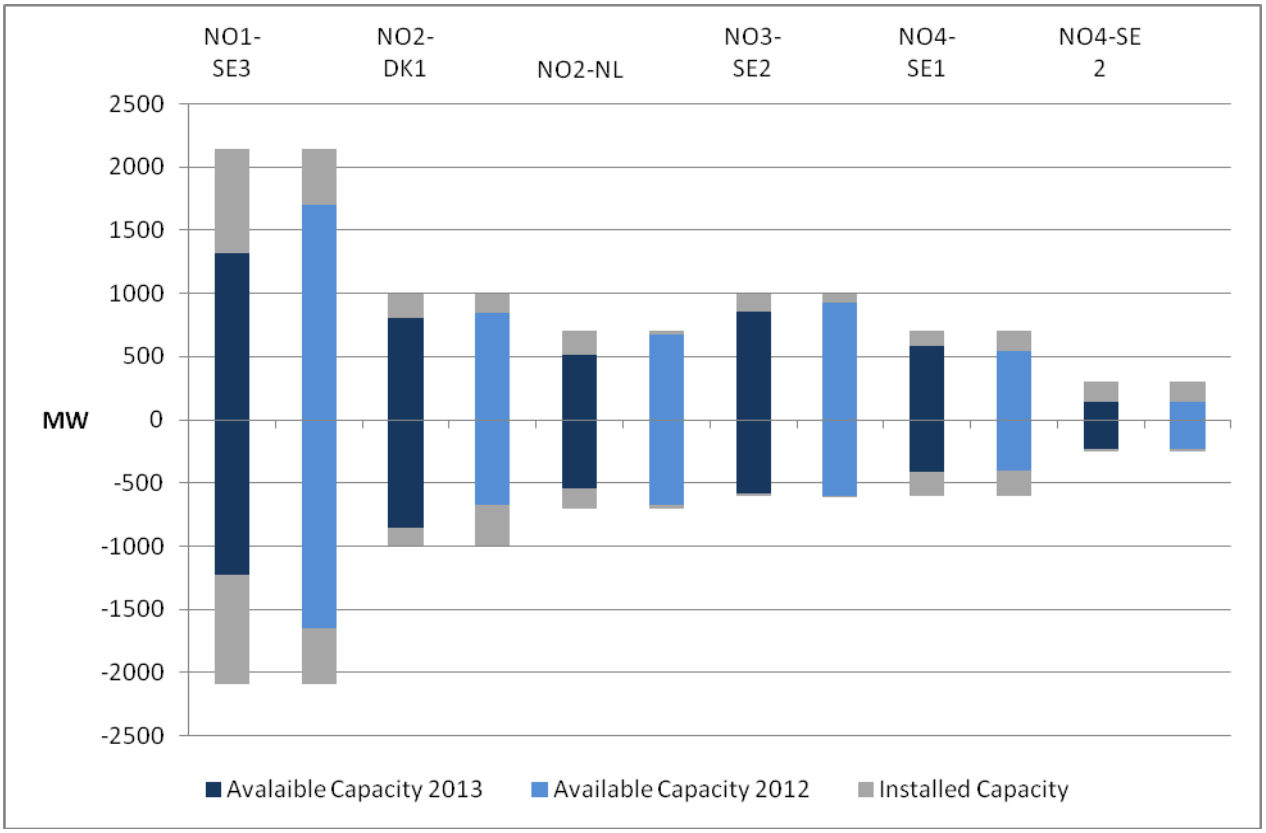
The Nordic TSOs are investigating whether and how the Flow Based capacity calculation method may have merit in the Nordic market.

All cross border capacity is allocated to the market through implicit auctioning through the NPS.

In 2013 the interconnectors between the Nordics and the continent were handled through so-called interim tight volume coupling. From early 2014 these interconnectors are included in the price coupling of the NWE region, like all interconnectors in North-West Europe were integrated in the Price Coupling of Regions.

Cross-border capacity with Sweden, Denmark, and the Netherlands

Due to fluctuations in the power situation and variations in available transmission capacity between elspot areas, the extent of congestions in Norway varies over time. Figure 2 below shows the average transmission capacity that has been available to the market on the interconnectors that Norway has with its neighbours compared to maximum capacity, in 2012 and 2013.



Figur 2. Available capacity in 2012 and 2013 as a portion of installed capacity for each interconnector. Negative capacity denotes export capacity from a Norwegian elspot area

The available transmission capacity between Eastern Norway (NO1) and SE3 (Mid-Southern Sweden) fell from 79 percent in 2012 to 60 percent in 2013. The main reason for this drop in availability was the replacement of 2 out of 3 sets of cables across the Oslofjord (Rød-Hasle). From August 19th to November 11th these cables, related to the Rød-Hasle connection, constitutes one of the major internal east/west connections that directly impacts the available capacity on the NO1- SE3 interconnector. The outages in the internal grid more than halved the cross-border capacity. In direction towards SE3 (2145 MW maximum capacity), the reduction in capacity varied between 1245 to 1845 MW. In the direction towards Eastern Norway (2095 MW maximum capacity), capacity was reduced between 895 to 1795 MW.

The subsea interconnector NorNed, between South West Norway (NO2) and the Netherlands also had reduced availability in 2013 compared to 2012. Bad weather on the Dutch side of the cable caused an outage on October 28th, which put the cable out of operation. The cable was put back into operation on December 19th. This outage reduced the overall availability on NorNed from 96 percent in 2012, to 79 percent in 2013. All reductions in available capacity on the DC-interconnectors, NO2 – NL and NO2 –

DK1, were due to outages or revisions/maintenance work directly related to the physical installations and not to congestions management.

The import capacity of Mid Norway from SE2 decreased with 7 percentage units from 2012 to 2013, while availability of Norway's other interconnectors remained relatively unchanged.

3.1.5 *Compliance*

DSOs

NVE monitors network companies and ensures compliance with the neutrality criteria in accordance with the Energy Act and regulations laid down in accordance with the Act. NVE enforces compliance by various means and has the authority to use formal demands and fines in cases of non-compliance.

NVE requires DSOs with more than 100 000 customers to maintain a compliance programme to ensure neutrality vis-à-vis power suppliers and retail customers. NVE also encourages DSOs with less than 100 000 customers to maintain similar procedures. The compliance programme requirement only affects DSOs that have a vertically integrated power supplier in their corporate structure.

According to directive 2003/54/EC, network and supply companies may be bundled if the number of customers (both residential and business customers) does not exceed 100 000. To avoid cross-subsidies and discrimination of electricity suppliers, NVE regulates these bundled companies. The neutrality criteria require clear separation of monopolistic network activities and activities related to electricity sales. Further, the DSOs have a duty to give the retail market customers sufficient information about aspects of the retail market.

3.2 Promoting Competition

3.2.1 *Wholesale markets*

The Norwegian wholesale electricity market is part of an integrated Nordic market. The Nordic electricity exchange, Nord Pool Spot (NPS) organizes and operates the day-ahead and intraday markets where market participants can buy or sell physical power for delivery the next day. The day ahead price and volume are determined by an auction at the intersection point between the market's supply and demand curves aggregated from all individual bids and offers. The intraday market is based on continuous trading. Trading in individual hours opens after the day-ahead market closes. Trading capacities not utilized in the day-ahead market are available in the intraday-market.

The day ahead market at NPS covers all bidding zones of Norway, Sweden, Finland, Estonia, Latvia and Lithuania. All bidding zones are coupled through implicit auctioning. Market participants at NPS consists of 361 member companies from 20 different countries. The total day ahead traded volume in 2013 was 349 TWh (334 TWh in 2012). This volume constitute a market share of 84 percent (77 percent in 2012) of the regions total consumption. Many market participants and high market share indicates good liquidity and a well-functioning market, which contributes to the participants' confidence in price formation at NPS.

NPS is also responsible for the System price calculation. The System price is the underlying price reference of the most liquid long term financial trading and hedging contracts in the Nordic market. The System price denotes an unconstrained market clearing price for all bidding zones in the Nordic countries.

Nasdaq OMX is a regulated exchange providing long term financial power derivatives for hedging and trading purposes. The exchange listed derivatives are referred to both the Nordic System price and bidding zone prices. Different combinations of listed derivatives represent both zonal and cross border hedging opportunities covering all Nordic bidding zones.

Nasdaq OMX also offers derivatives of German, Dutch and UK electricity, carbon emissions and electricity certificates. The total turnover at Nasdaq OMX amounted 922.5 TWh in 2013, compared to 944.7 TWh in 2012. The total clearing turnover of financial derivatives amounted 1679.5 TWh in 2013, compared to 1703.0 TWh in 2012.

3.2.1.1 Price monitoring

NVE monitors price developments in the wholesale market, and publishes weekly and quarterly reports that analyses the previous week/quarter developments in the Norwegian and Nordic electricity markets. These reports contain a description of wholesale electricity prices, both system price and price differences across price areas, the hydrological situation, power generation and –consumption, and cross border exchange.

Figure 3 below shows the development of the system price during 2013. The annual average system price increased by 22 percent from 2012 to 38.10 Euro/MWh in 2013. The highest monthly system price in 2013 of 45.62 Euro /MWh occurred in April. Further, there were less overall variability in the system price in 2013, compared to 2012.

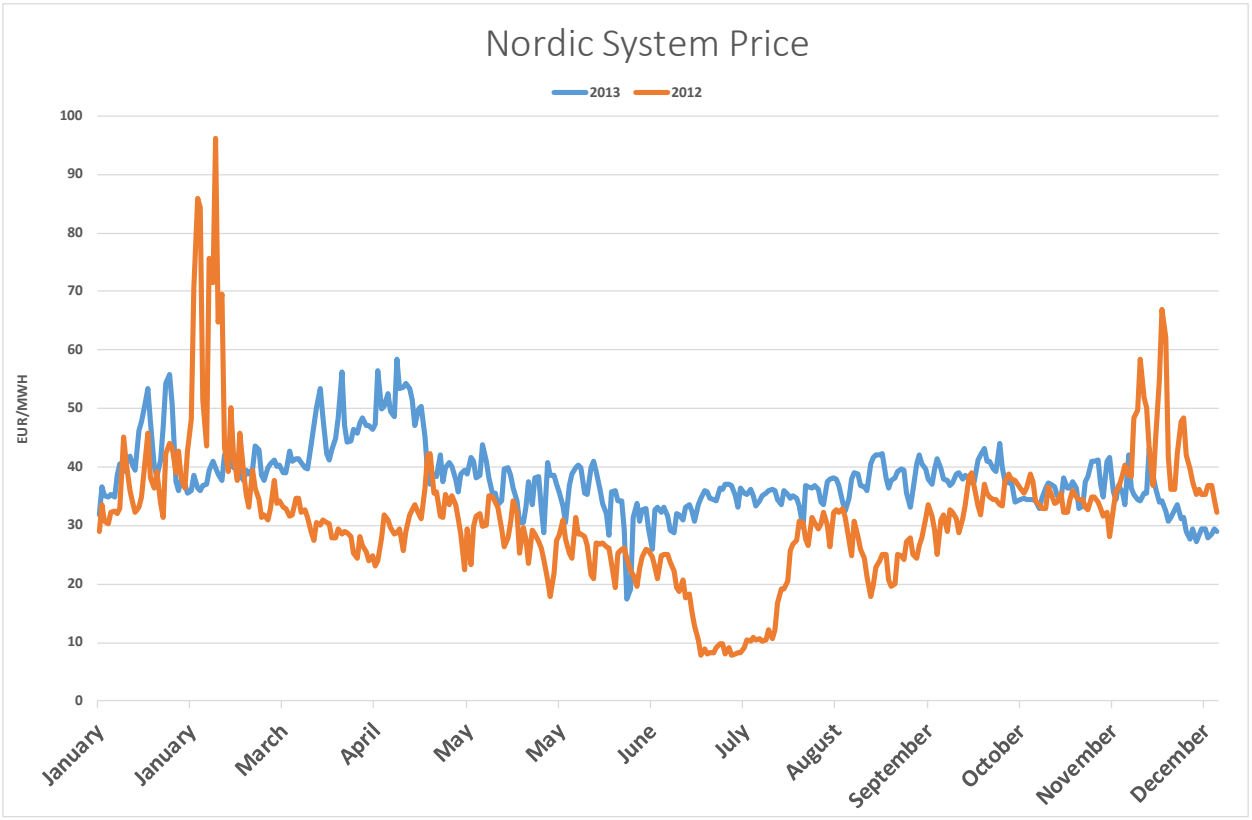


Figure 3. Nordic System price 2013 and 2012, EUR/ MWh. Source Nord Pool Spot

Figure 4 shows the price developments in the 5 Norwegian bidding zones during 2013, whereas table 4 shows the annual average area prices. There were an increase of prices in all bidding zones in 2013 compared to the year before. The increases varied from 24 percent to 30 percent.

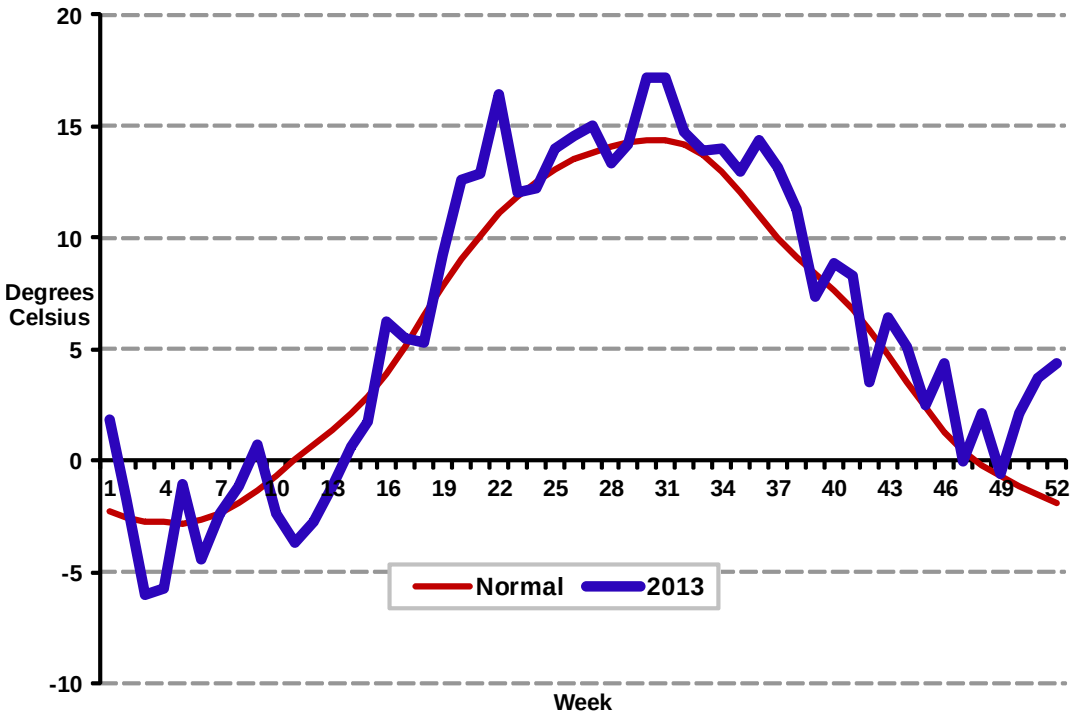
Figur 4. Price developments in Norwegian bidding zones in 2013

The Norwegian elspot area prices correlates highly with the system price development. The exception was in the period from mid August to mid October, where grid works caused congestion that lead to price differences. The installation of cables across the Oslofjord, as mentioned in section 3.1.4, contributed to a lock-in effect of power in southern Norway (NO1, NO2 and NO5). This caused prices in the south to remain relatively low while elspot areas Mid and North Norway (NO3 and NO4) were more coupled to the Swedish prices.

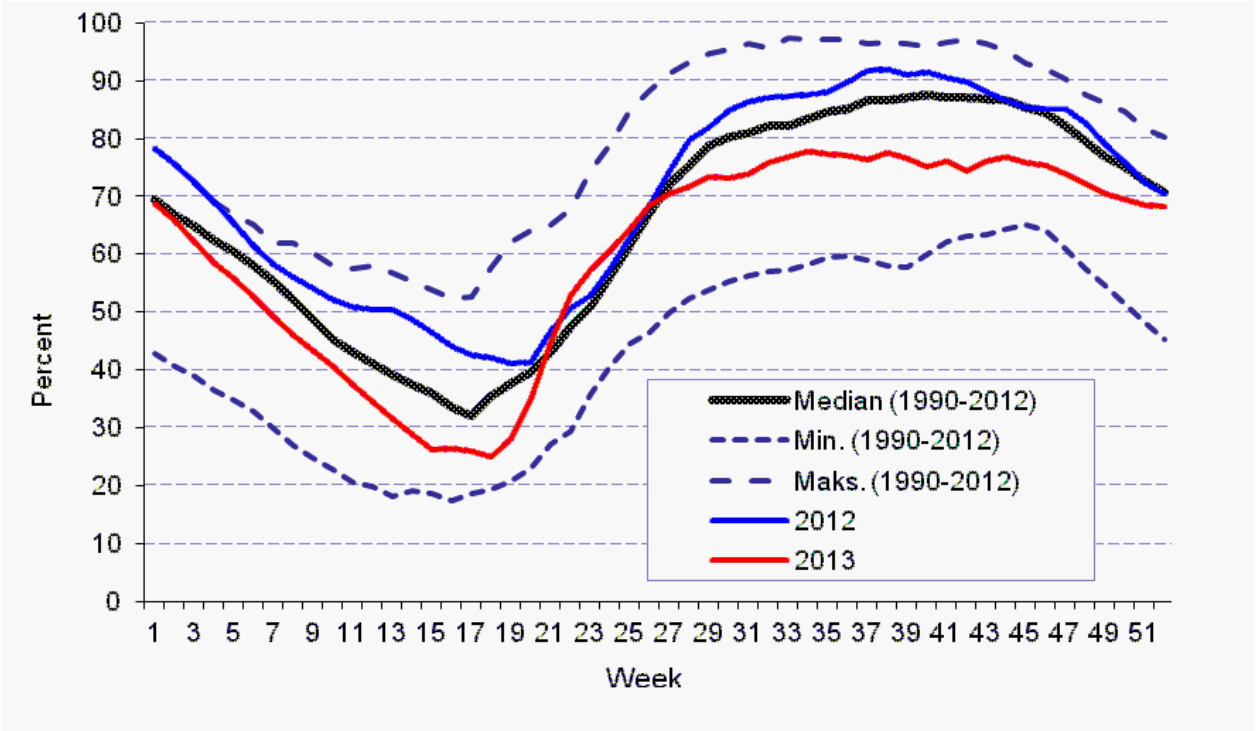
Spot prices €/MWh	2013	Change from 2012
East Norway (NO1)	37.56	27 %
South West Norway (NO2)	37.33	28 %
Mid Norway (NO3)	38.96	24 %
North Norway (NO4)	38.60	24 %
West Norway (NO5)	37.60	30 %

Table 4. Annual prices in the Norwegian elspot areas, Euro/MWh

The price developments on NPS can mainly be explained by changes in fundamental factors such as variation in precipitation, hydro reservoir levels, inflow and temperature. The figures 5 and 6 below show the weekly developments of temperature and hydro reservoir levels.



Figur 5. Average weekly temperatures for the cities Oslo, Bergen, Trondheim and Tromsø in 2013 compared to normal



Figur 6. Hydro reservoir levels in Norway. 100 percent represents about 82 TWh

The year 2013 started with normal reservoir levels. This is 9.7 percentage units lower than the record high levels from 2012. This indicates more scarcity of energy in 2013 compared to 2012, and is a contributing factor to higher prices. Norwegian reservoir levels reached the minimum of 25 percent in week 16, and did not start to rise before week 19. Cold weather delayed the snow melting season and increased consumption, which in turn increased prices. This was the cause of the "pressed" power situation in April. Warmer weather from the end of April decreased consumption, and increased the inflow, which in turn brought prices down.

In 2013 the reservoir levels in Norway reached a maximum of 77.8 percent in week 34. In a normal year, the hydro reservoir levels reach a maximum of 87.6 percent in week 40. Less precipitation than normal in the summer and less energy stored as snow explain this development. Mid and North Norway experienced higher prices than the Southern elspot areas in Norway, as they were less affected by the capacity reduction between Eastern Norway and Sweden. Mid and North Norway were therefore more often price coupled with Sweden, that had higher prices than Norway in average in 2013.

For the remainder of 2013 however, the reservoir levels was not drawn down than as fast as normal, or compared to 2012. The result at the end of 2013 was normal reservoir levels at 68 percent, the same as in week 1. One reason for this was that precipitation in the fourth quarter was higher than normal, which also led to more inflow than expected. Because of significantly higher temperatures than normal in the fourth quarter in 2013, consumption declined and contributed to lower prices and normal reservoir levels at the end of the year.

As regards price monitoring in the wholesale market, NVE supports the Norwegian Competition Authority in monitoring Norwegian generators' bidding behaviour at NPS. NVE has developed a model for this purpose. The model stipulates a market price given efficient utilization of reservoir-water (estimation of water values), and compares this estimated price to the actual price in the market. Price differences that can not be explained as price-taker behaviour, should be investigated by looking at the different participants' bidding in the market place. As a part of this process, NVE has the full mandate to collect information about the bidding from NPS.

NPS' lack of price calculation of the day-ahead market

In early August 2013, for the first time in its near 20 year history, NPS struggled to determine market results[9].

NPS' regular procedure for operating the day-ahead market is to receive bids and offers from the participants, initiate the necessary computational processes (operating the Sesam algorithm), and publish the market result between 12.30 – 13.00 local time.

On Sunday 4 August, NPS experienced an extended computational process, which did not give any market results within the calculation time limit. At 12.55 NPS announced that the market results would be delayed. As NPS continued its work to calculate market results, the TSOs were continuously informed, and information was published to the market. At 20.00 NPS declared a 'no price situation' and reverted to the fall back procedure described in the NPS Rule Book. This implies applying the price from the previous similar trading day. In this case, that meant Friday 2 August.

Due to fundamental variables such as power consumption and generation being similar between Friday and Monday, the TSOs were able to operate the power system as normal with only minor challenges.

[9] The market results consist of the day-ahead prices (system price and elspot area prices), power flows and volumes.

NVE deems this incident as a serious occurrence. NVE sees that in the near 20 years of operation, this is the first and only time of such an incident. NVE also notes that NPS followed the Rule Book and ensured information to the market and to the TSOs during the incident. Furthermore, the technical problem which caused the incident, was identified and solved quickly and efficiently by NPS. Furthermore, NVE was quickly assured that NPS had taken every necessary step to ensure that a re-occurrence would not take place. Robust and reliable price setting is fundamental to a well-functioning market, and NVE has confidence that NPS fulfills the role of a robust market place.

3.2.1.2 Monitoring the level of transparency, including compliance with transparency obligations

Rules governing market conduct on the organized market place

NPS holds a market place license issued by NVE, which obliges NPS to establish a market surveillance to monitor the participants' behavior. NPS has issued Market Conduct Rules (MCR), which applies for all of NPS' members. The MCR lay down prohibitions regarding inside trading and market manipulation, and are enforced by the market surveillance (MS). During 2013, the MCR were aligned with EU No 1227/2011 on Wholesale Energy Market Integrity and Transparency ('REMIT'). An important term in MCR is the participants' obligation to disclose inside information.

During 2013, NVE and NPS MS unit had three meetings where NVE was informed of the on-going work and cases of interest relating to market participants conduct on the organized market place. Six cases were such that they raised suspicion of market misconduct, and these cases were sent to the relevant authorities (i.e. NVE and the relevant national regulatory authority) by the MS unit. If a suspicion arises during MS' monitoring performance, the MS unit investigates the relevant case in detail to find an explanation and notifies NVE and the relevant national regulatory authority accordingly.

NPS regulates market conduct through the NPS Rulebook. All market participants are required to adhere to the standard terms for participation in the NPS Rulebook:

- Bidding behaviour:
    - The standard terms for trading in the physical markets include rules for bidding.
- Market surveillance:
    - Both NPS and NASDAQ OMX are obliged to provide an internal market surveillance.
    - The market surveillances of NPS and NASDAQ OMX cooperate to monitor the participants' behavior to ensure an efficient financial and physical power market. The monitoring of possible abuse of the interaction between the two markets is taken care of by regular meetings and rules for exchange of information between the two market surveillances.
    - NPS Market surveillance must ensure that market participants play by the rules to maintain the markets confidence in the exchange. The Rulebook for trading at NPS regulates market conduct in the physical market with regards to disclosure of price relevant information, misuse of insider information and market manipulation.

Furthermore, regulations given in the Norwegian Competition Act regarding abuse of dominant position apply. These regulations are under the formal competence of the Norwegian Competition Authority. NVE and the Competition Authority cooperate as described under the chapter 3.2.1.1 about price monitoring. Furthermore, if there is suspicion of abuse of dominant position, NVE has a mandate to collect information about market participants' bidding behavior from NPS for the purposes of analysis, and forward it to the Competition Authority for a formal decision.

Transparency in the wholesale market

According to NPS' MCR, participants and clearing customers shall disclose any information regarding business or facilities owned or controlled or claimed balance responsibility for in whole or in part by the participant or clearing customer, in particular information relevant to facilities for production, consumption or transmission of electricity, regarding:

- any planned outage, limitation, expansion or dismantling of capacity in the next 6-weeks period of more than 100 MW for one generator, consumption or transmission facility, or more than 200 MW for one production station, including changes of such plans;
- any planned outage, limitation, expansion or dismantling of capacity of more than 400 MW for one production station, consumption or transmission facility for the current calendar year and three calendar years forward, including changes of such plans
- any unplanned outage or failure relating to more than 100 MW for one generator, consumption or transmission facility, and more than 200 MW for one production station, including updates on such outages or failures.
- any erroneous or missing Orders in the Elspot market of 200 MW or more; this term was introduce in 2013
- any information that is likely to have a significant effect on the prices of one or more derivatives on products if made public.
- any inside information not covered by the above bullet points.

This information is published at NPS' website under Urgent Market Messages (UMMs). A new improved UMM application was launched on May 22nd 2013 which aims to make the flow of information more efficient. MS monitors the members' duties to the disclosure requirements in MCR. In 2013, MS concluded 44 breaches of the disclosures requirements, and 2 incidents regarding insider trading.

NPS publishes a range of market data per market time unit (per hour):

- Elspot (day ahead market)
    - System price
    - Prices per elspot area
    - Volumes – buy and sell volumes per area
    - Available transmission capacities between elspot areas within the exchange area, and on interconnectors to continental Europe
    - Flow between elspot areas and on interconnectors to continental Europe

- Elbas (intraday market)
    - Prices
    - Flows
    - Available transmission capacities

- Regulating power (balancing market)
    - Volumes for up or down regulation per elspot area
    - Prices per elspot area
    - Special regulation volume (congestion management)
    - Automatically activated reserves

- Power system data
    - Production
    - Consumption
    - Exchange
    - Hydro reservoirs

3.2.2 Retail markets

The Norwegian Energy Act states that any entity engaged in the physical trading, generation and/or distribution of electric energy in Norway is required to hold a trading license. NVE is through the Energy Act given the authority to provide such licenses, and is also delegated the power to issue supplementing regulation through the terms and conditions of the trading licenses whenever necessary.

At the end of 2013 about 460 companies where holding a trading license. Of these 117 were electricity suppliers supplying residential customers, while 154 were DSOs. Eight of the DSOs in Norway have more than 100 000 customers.

Since the liberalisation of the electricity market in 1991, the number of residential customers with a supplier different from the incumbent supplier has steadily increased. However, most incumbent suppliers still have a dominant position within their local grid area. The market share of the dominant supplier in each grid area varies from 25 to 96 percent of all residential customers (measured by number of metering points). On average, the dominant supplier has a market share of about 70 percent of residential customers within its own grid area. This share has been stable throughout 2013.

3.2.2.1 Monitoring the level of prices, the level of transparency, the level and effectiveness of market opening and competition

The Norwegian Competition Authority is responsible for the national price comparison website for electricity contracts. The website offers price comparisons within three types of contracts, and the price calculator helps the customer to evaluate the offers presented and choose a supplier. Suppliers are only required to provide information on prices and contractual terms if their contract falls within any of the three specified types of contracts.The terms and conditions of these contracts must be in line with the standard terms and conditions resulting from negotiations between the Norwegian Electricity Industry Association (Energy Norway) and the Norwegian Consumer Ombudsman. NVE advise customers in the

retail market to use the price comparison website whenever they choose a supplier, and all DSOs are obliged to inform their customers about the price comparison tool.

Although most suppliers use the standard terms and conditions mentioned above in their contracts, many suppliers have additional contractual terms that make their contracts ineligible for presentation on the national price comparison website. Thus, there are many contracts offered in the market that are not on the price comparison website.

There are no regulated prices in Norway. Customers who have not yet chosen a supplier, shall the first six weeks be served by the network company (supplier of last resort) at a price that is maximal 5 øre/kWh excl. VAT (or 6.25 øre/kWh incl. VAT) above spot price. After 6 weeks the supplier of last resort is obliged to set the price so that the customers are provided with an incentive to find a supplier.

NVE publishes an overview of the retail market prices on a weekly basis, comparing the average price of the three standard types of contracts the past week, and by presenting an estimation of the average accumulated electricity cost for the customers so far this year. The data is collected from the Norwegian Competition Authority and Nord Pool Spot. The data is processed with the intention of presenting a more representative price for the different bidding zones, i.e. taking into account that many customers have contracts that are not presented on the national price comparison website. The data is published in a weekly report on NVE's website, and are regularly referred to by the public media. Further, NVE publishes similar retail market data in a quarterly report on the energy market.

As of January 2012, a mandatory support system to stimulate increased investments in the production of electricity from renewable energy sources was in place in Norway. The electricity producers included in the support system receive one electricity certificate from the authorities for each megawatt hour of renewable electricity generated. At the same time, electricity suppliers and certain electricity users are obliged to purchase electricity certificates for a specified proportion of the volume of electricity they deliver or use. The electricity certificates are traded in a common Norwegian-Swedish market, and the price of electricity certificates is determined by supply and demand. The consumers of electricity finance the system, as the supplier's costs of purchasing the certificates are added to the electricity price. Electricity suppliers are required to refer to NVEs website to inform their customers about the costs imposed by the electricity certificate obligation.

In 2013, electricity consumers had to pay for electricity certificates for 4.9 percent of their total electricity consumption. This share will steadily increase towards 2020 where it reaches it's peak at 18.3 percent of the total yearly electricity consumption. The actual additional cost paid by the consumers in 2013 due to the introduction of the system was determined by the price of the electricity certificates, which varied according to supply and demand. On average, a customer paid an additional 1.22 øre/kWh due to electricity certificates in 2013. This means that a residency using 20 000 kWh of electricity in 2013, paid a total cost of 244 NOK (excluding VAT).

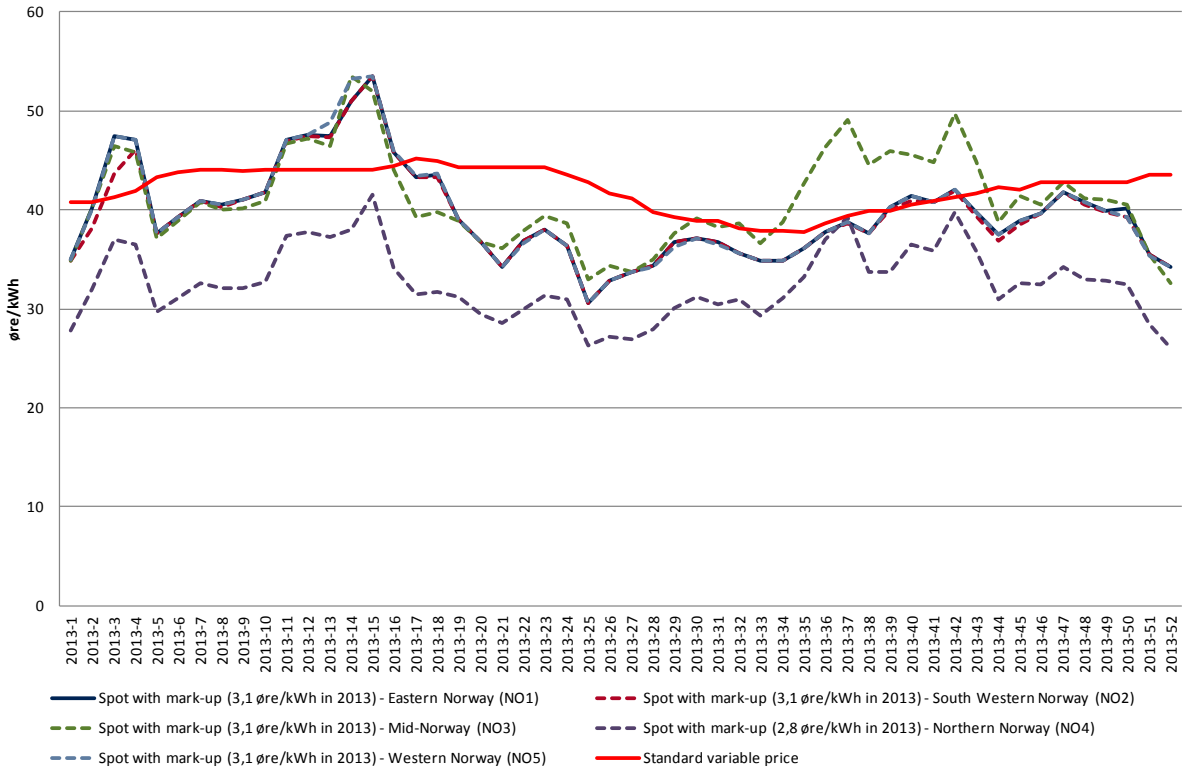


Figure 7. Average price development for the spot contract in the five Norwegian bidding zones

The figure above shows the average price development throughout 2013 for the spot contracts in the five Norwegian bidding zones of the Nord Pool Spot power exchange, together with the standard variable contract.[10] These two contract types are common, but customers can freely choose from a wide range of other contract types, for instance variable contracts with a price cap or price guarantee, contracts bundled with other products (gift certificates, airline mileage bonuses, etc) or contracts including guarantees of origin.

In the retail market, general competition legislation (The Norwegian Competition Act and the competition rules applicable to undertakings of the EEA Agreement) apply, and the Norwegian Competition Authority has full responsibility. The physical power exchange, Nord Pool Spot AS, operates under a market place license issued by NVE pursuant to the Norwegian Energy Act. The marketing of electricity contracts are regulated by the Norwegian Consumer Council.

3.2.2.2 Recommendations on supply prices, investigations and measures to promote effective competition

In general, NVE aims at identifying and reducing the barriers in the retail market that keep consumers from being actively involved in the retail market. By providing information about the national price

[10] The standard variable contract is the default contract offered by most of the incumbent suppliers. The standard variable contract typically follows the spot price with a lag of about two weeks, since the supplier is obliged to inform about price modifications two weeks before they take place.

comparison web site and presenting a compilation of average retail market prices on a weekly basis, NVE encourage consumers to ensure that their contracts are among the most competitive ones.

One of the investigations NVE carries out in order to monitor the efficiency of the retail market, is a quarterly survey of the number of supplier switches and the market shares of dominant suppliers in the retail market. These data are collected from a group of DSOs that combined constitute 88 percent of the retail market (measured by the number of metering points), and a quarterly report is published on NVEs web site. NVE has estimated the total number of residential customers to be approximately 2 497 000. Among residential customers, there were approximately 387 000 supplier switches in 2013.

A report from 2011 revealed that 60 percent of Norwegian consumers had a contract that was not presented on our national price comparison website. On average, the contracts not presented on the website were more expensive than the ones that were presented.[11] In 2013, NVE collected data on all contracts and prices offered in the residential market in 2012, to obtain detailed and updated information on contracts offered to household costumers. The data collected will also give us some information about supplier margins. A report detailing our findings will be published in 2014.

The Norwegian retail market for electricity is set to undergo substantial structural changes in coming years, as part of the goal to further increase competition and efficiency in the market. The implementation of smart metering by 2019, and the creation of a national point of data management (Elhub) will be the focal points of these changes, and will make the exchange of information in the retail market more efficient. Smart meters are expected to give incentives for increased energy efficiency and peak load management, by providing detailed feedback on consumption to consumers. NVE considers the facilitation of active, well-informed consumer behaviour to be a key challenge for the Norwegian retail market. The implementation of Elhub will standardise the exchange of hourly metering data, simplifying the communication of metering data in the chain between DSOs, suppliers and consumers.

NVE is also considering a supplier centric model for the Norwegian retail market, in accordance with NordReg recommendations. The implementation of a supplier centric model is key to the agreed harmonisation of legislation necessary to create a common Nordic retail market for electricity. The model under consideration by NVE centres on a combined billing regime, which aims to simplify the market structure and increase consumers' understanding of the electricity market. NVE expects a supplier centric model to reduce switching barriers. In 2013, NVE spent a significant amount of time preparing new regulation for these future changes.

3.3 Security of supply (if and in so far as NRA is competent authority)

3.3.1 Monitoring balance of supply and demand

Contingency planning and preparedness

The large share of hydro based energy production makes the Norwegian power system vulnerable to variations in inflow and precipitation. Norway has detailed regulations and means for handling critical energy situations and energy rationing.

[11] Pöyry Management Consulting; «Analyse av priser og vilkår fra kraftleverandører i sluttbrukermarkedet»

The individual grid and production companies are responsible for routines regarding resources, material and equipment, but there are common arrangements to ensure that the individual companies cooperate on these issues.

Market information and monitoring

Several analyses are prepared by the Norwegian TSO, Statnett, and by NVE on scenarios of development in the energy and power balance. NVE monitors the energy and power balance over time and publishes regular reports describing and assessing the developments.

In normal operation strained situations or during operational disturbances

Through the national regulation of 7th May 2002 No 448 on the system responsibility in the power system, the TSO is granted duties and responsibilities to require mandatory participation in the regulation market, require regulation of power production (even when not part of the regulation market), and to require load shedding. Load shedding may be ordered manually, however, load shedding also occurs due to use of automatic system protection schemes. System protection schemes in the transmission grid can only be installed and operated based on decisions by the TSO.

Norway's special regulations for highly critical power situations

Statnett is responsible for the operation of the grid, also during extreme occurrences. NVE is head of the Power Supply Preparedness Organisation and also works as the rationing authority.

Regulations relating to power system operation regarding handling of extreme situations came into force on 1th of January 2005. This regulation aims at ensuring handling of extreme situations and is not relevant for normal operation. Through this regulation, Statnett is given an extended responsibility to continuously investigate and develop necessary measures to ensure that there is momentary balance at all times and to ensure the energy balance during the winter season. Statnett shall inform NVE of its different findings. NVE shall approve, with terms, the different measures before they are put into force. Costs for the different measures shall be handled within Statnetts revenue cap. Statnett has to develop the means within the following set of terms:

- Not to completely eliminate the probability for electricity rationing, but to reduce the risk.
- Must be effective for handling of extreme situation, and yet not influence the electricity market or investment decisions within the production or the network.
- Not to change or move Statnetts neutral and independent position in the power market.
- Contribute to a socio-economic handling of extreme situation and not to reduce the efficiency of the physical power market
- Take into consideration the already existing flexibility in production, transmission and consumption.

The different measures that are approved by NVE are:

- Mobile gas turbines which can be used for production back-up.
- Energy options, contract with different consumers to reduce the consumption.

The measures can only be activated after decision from NVE. The measures will only be accepted in a situation where rationing is considered likely.

Electricity peak demand

Domestic gross consumption in 2013 was 129,2 TWh (130 TWh in 2012).

The Norwegian peak demand occurs during winter season. The current all time peak electricity demand is 24 180 MW. This was measured in January 2013.

Year	Weekday	Date	Hour	Demand [MW]
2004	Monday	21.01.2004	9	20 675
2005	Wednesday	02.03.2005	9	21 401
2006	Monday	06.03.2006	9	21 575
2007	Wednesday	14.12.2007	9	21 588
2008	Thursday	14.02.2008	10	21 589
2009	Monday	05.01.2009	9	21 984
2010	Wednesday	06.01.2010	9	23 994
2011	Monday	21.02.2011	9	22 129
2012	Wednesday	05.12.2012	9	23 443
2013	Wednesday	23.01.2013	9	24180

Table 5. Peak demand for the last 10 seasons

According to demand forecast developed by the Statnett, the expected peak demand for Norway season 2014/2015 will be 25 000 MW with temperatures corresponding to a ten years winter day[12]. The same forecast based on average winter temperatures shows an excepted peak demand of 23 330 MW.

Currently available generation capacity

The Norwegian net generation was 134.2 TWh in 2013 (147.9 TWh in 2012). Hydro power generation accounted for around 96.1 percent of the total Norwegian net generation in 2013. At the end of 2013 the mean annual generation from hydro- and wind power was 133.4 TWh. This is calculated from the simulated production with the existing power plants at the end of 2013, and the mean inflow and wind from the years 1981-2010. The maximum annual generation from thermal power is about 7.7 TWh

[12] The coldest winter day that is expected to occur in a period of ten years.

including internal production. The inflow to the reservoirs could, at the extremes, vary between 90 and 150 TWh dependent on the precipitation from one year to another. The reservoir storage capacity of 86 TWh reduce the variation in hydro power production, that rises from the variation in precipitation.

Total installed generation capacity (at the end of 2013): 32 879 MW. Available generation capacity during a cold winter is about 25 000 MW.

	Installed capacity 31.12.2013 [MW]	Mean annual generation 31.12.2013 [TWh/y]	Net capacity added in 2013 [MW]	Expected increase in capacity in 2014 [MW]	Under construction on 31.12.2013 [MW]	License/permit given, not yet built [MW]
Wind power	811	2.0	97,5	45	45	3 064
Hydro power	30960	131,4	270	162	646	1116
Thermal power	1 040*	7.7**	-68		0	1380

Table 6. *Current generation fuel mix.* Actual investment commissioning during 2013 (* Does not include 300 MW capacity in gas-fired mobile reserve plants) (Assumes production at full capacity)**

Net increase in hydropower generation capacity during 2013 has been about 270 MW. During 2013 97.5 MW wind power has been commissioned.

Monitoring balance of supply and demand on the national market, the level of expected future demand and envisaged additional capacity being planned or under construction.

The regulatory authority has delegated the responsibility for power system planning in Norway to an appointed licensee in a given planning area. 18 planning areas have been established: 17 regional areas which comprise planning in the regional distribution grids (33 kV – 132 kV), and one for planning the transmission grid (132 kV-420 kV).

Every second year both regional planning areas and the national planning area have to develop and/or update a regional distribution grid development study. The study period for the grid development is a minimum of 20 years.

The power system study must describe today's grid, future transmission conditions together with anticipated measures and investments. The study includes presentations of statistics with characteristics of generation, transmission and usage of electrical energy, and also includes conditions that are of importance and of relevance for the development of the power system in the designated area. Simplified socio-economical analysis must be presented for all grid investments that require environmental impact

assessment (EIA). The main objective of power system studies is to contribute to a socioeconomically rational development of the regional grids and the central grid.

The bianual updated power system studies are submitted to NVE. The regulatory authority monitors the level of expected future demand and envisaged additional capacity being planned through the power system studies. The power system studies are also important in NVE's handling of the applications for a license to energy plants or network installations.

3.3.2 Monitoring investment in generation capacities in relation to SoS

Authorization criteria for new generation investments and long term planning

For all new projects (wind power plant, gas power plants, hydro power plants, power lines, transformers) a license to build and operate must be granted. For all projects NVE considers the project economy, public and private interests and environmental issues.

The regulatory authority has delegated responsibility for power system studies to an appointed licensee in a given grid area. The main task of the work on the power system studies is to contribute to a socio-economic rational development of the regional distribution grids and the transmission grid. In this respect the energy carriers in question are for stationary energy usage. The power system studies will continue to be an important base document in the regulator's handling of the applications for a license to build or expand an energy plant or installation. This is especially of importance regarding applications for the larger overhead line projects.

Progress in major infrastructure projects

A new 140 km DC cable between Norway and Denmark, Skagerak IV, was granted license June 2010. The transmission capacity will be 700 MW. The cable is expected to be in operation by the end of 2014. There is also construction and foreign trade license applications for a DC cable to Germany with capacity of 1400 MW. The project is being developed by the Statnett in cooperation with the German TSO (Tennet) and the German national bank (Kfw) and is expected to be commissioned in 2018. Further, Statnett and National Grid in UK have signed a cooperation agreement with the aim of commissioning a new DC cable between Norway and UK within 2021. The project has received construction license. Foreign trade license application was submitted to the Ministry in May 2013. Excepted capacity is 1400 MW.

The 92 km, 420 kV OH line from Sima to Samnanger was commissioned in December 2013. The line improves the security of supply to the region of Hordaland/Bergen area with Norway's second largest city, and also integrates new hydro power.

The 285 km, 420 kV OH line from Sogndal to Ørskog is under construction and is expected to be commissioned in 2017. This line will improve the security of supply in the Mid-Norway area. It will also improve RES integration and net transfer capacity.

The 160 km 420 kV OH line for Ofoten to Balsfjord is under construction and is expected to be commissioned in 2017/2018. This line will improve the security of supply in the North of Norway. Expected load growth and RES integration will benefit from this investment.

The 360 km 420 OH line for Balsfjord to Hammerfest was granted license in 2012 by NVE, but appealed to the Ministry of Petroleum and Energy. This line will improve the security of supply in the North of Norway. Expected load growth and RES integration will benefit from this investment. It is expected to be commissioned in 2020/2022.

Expected future demand and envisaged capacity for the next 5 years and 5-15 years

The grid system planning process in Norway is made compulsory from the regulator through power system studies. The country is divided in 17 regional planning areas where one of the DSO's has the responsibility of coordinating the planning process among the DSO's in the area, and make a regional distribution grid development study. In the transmission grid the Statnett has the responsibility for the planning process and issuing of the transmission grid study.

Every second year both regional planning areas and the national planning area have to develop and/or update a regional distribution grid development study. The updated power system studies are submitted to NVE for consent. The study period for the grid development is a minimum of 20 years.

The power system study must describe today's grid, future transmission conditions together with anticipated measures and investments. The study includes presentations of statistics with characteristics of generation, transmission and demand of electrical energy, and also includes conditions that are of importance and relevance for the development of the power system in the designated area. Simplified socio-economical analysis must be presented for all grid investments that require environmental impact assessment (EIA). When applying for a license to build or reinvest in the regional grids or central grid, the applied solution must be part of the latest grid study submitted to the regulator.

The main goal for the power system studies is to contribute to a socioeconomically rational development of the regional distribution grids and the transmission grid. The power system studies will continue to be important in NVE's handling of the applications for a license to energy plants or network installations.

3.3.3 Measures to cover peak demand or shortfalls of suppliers

The quality and level of maintenance of the networks

The CENS arrangement referred to in chapter 3.1.3 is the main regulatory tool to ensure a proper level of maintenance of the networks.

Further, NVE carries out audits on companies regarding operation and maintenance. The quality of the maintenance is monitored through these audits.

Measures to cover peak demand

Through the national regulation of 7th May 2002 N^{o} 448 on the system responsibility in the power system, the TSO is granted duties and responsibilities to require mandatory participation in the balancing market, require regulation of power production (even when not part of the balancing market), and to require load shedding. Load shedding may be ordered manually, however, load shedding also occurs due to use of automatic system protection schemes. System protection schemes in the transmission grid can only be installed and operated based on decisions by the TSO.

Shortfalls of one or more suppliers

In the case of shortfall of a supplier, the local network company takes over as supplier of last resort. The tariff to the customer is regulated for the first six weeks at the elspotprice plus 5 øre/kWh excl. VAT (or 6.25 øre/kWh incl VAT). After six weeks, the network company is obliged to provide the customer with an incentive to choose a supply contract from an ordinary supplier.

4 THE GAS MARKET

The Norwegian gas market is small, and is expected to remain small.

By EEA Joint Committee Decision No 146/2005 of 2 December 2005, Norway was awarded status as an emergent market within the meaning of Article 2 (31) of the 2nd Gas Market Directive (Directive 2003/55/EC).

Net domestic consumption including non-energy use and gas to power and district heating was 1.5 billion Sm3 in 2013. This is a 4 percent increase from the year before.

Net domestic consumption of natural gas was 506 million Sm3 in 2013. This is a 13.2 percent increase from the year before. The increase was in Liquefied Natural Gas (LNG) and natural gas transported in pipelines, while consumption of Compressed Natural Gas (CNG) was unchanged.

2012			2013		
Natural gas transported in pipelines	CNG	LNG	Natural gas transported in pipelines	CNG	LNG
199	4	244	209	4	293

Table 7. Net domestic consumption of natural gas in Norway (million Sm3)

5 CONSUMER PROTECTION AND DISPUTE SETTLEMENT IN ELECTRICITY

5.1 Consumer protection

Network companies are obliged to connect customers within their licence area.

The electricity market is open for all customers, and the prices are set in the market. By contractual law, the suppliers are required to provide the customers with the terms and conditions for the chosen electricity contract. All suppliers are obliged to state the price on the contracts they offer in a certain way according to regulations managed by the Norwegian Consumer Ombudsman. Further, the suppliers are obliged to inform the customer about any price changes deviating from the agreed upon price before the price change take place. Change of supplier has been free of charge for all customers since 1997.

To strengthen the consumer's position in the retail market, the DSOs are by regulation obliged to provide the customers with information regarding both network issues and electricity supply issues. The DSO must provide the customers with information regarding the terms and conditions of the electricity supplied by supplier of last resort, and give the customers easy access to their consumption data by giving access to a web service and putting information in the invoice, etc. Further, they are obliged to provide the customers with neutral information on how to choose a supplier, which suppliers are available in the given grid area, information about the national price comparison web site, and contact details to the Norwegian Electricity Appeal Board.

To make sure network companies do not abuse their power as monopolists, they are regulated with a revenue cap in addition to regulations regarding tariff structure. The Norwegian Parliament annually grants a certain amount of support to reduce network tariffs for customers in areas with the highest distribution costs.

The DSO is the supplier of last resort mainly to ensure that the customer is supplied with electricity, even if they have not signed a contract with an ordinary supplier. The price charged by the supplier of last resort is designed to give the customer an incentive to choose an ordinary supplier. However, the DSO, as the suppler of last resort, has a high threshold for disconnecting a customer unable to handle the electricity bills, and has to make sure customers are protected from disconnection when life or health is at risk.

Though there are no particular measures in the Norwegian Energy legislation aimed at protecting vulnerable customers, they are protected through Norway's well-developed general welfare system. When the social services have guaranteed for a customer's payment, disconnection is prohibited.

5.2 Dispute settlement

NVE is authorized to monitor compliance with, and take decisions according to, the Energy Act and regulations laid down in accordance with the Act. NVE handles complaints and disputes regarding network regulation and tariffs, quality of supply, metering and settlement, billing, supplier switching,

neutrality and non-discrimination, system operation and the obligations and powers of the transmission system operator (Statnett).

The Norwegian Electricity Appeal Board assists customers regarding complaints related to contracts for grid connection, grid use and/or electricity supply that have not been settled between the customer and the electricity supplier and/or the DSO. All companies that have received a trading license from NVE under the Energy Act are included in the scheme. The Board consists of two representatives appointed by the Norwegian Consumer Council, and two representatives appointed by electricity suppliers. The Board is run by a legal professional. In 2013 the Norwegian Electricity Appeal Board received 268 complaints and reached a decision in 60 cases.