

National Report 2015



Norwegian Water Resources and Energy Directorate (NVE)

The data/content refer to 31 December 2014 or the reporting period 2014 unless otherwise stated.

FOREWORD

The Norwegian electricity market formally opened up for competition when the Energy Act came into force on 1 January 1991. The regulatory activities are ensured by the Norwegian Water Resources and Energy Directorate (NVE). NVE has played an active role as electricity market regulator in the development of network regulation, real market access for all customers, simplified supplier switching procedures, securing security and quality of supply and an efficient regulation of the energy system operation in Norway.

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

Norway is a member of the European Free Trade Association (EFTA) and is a part of the European Economic Area Agreement (EEA). As a consequence the EEA procedures regarding the adoption of new EU directives is applicable to Norway. The Electricity Directive 2003/54/EC and Regulation 1228/2003 was approved in the EEA Committee in December 2005. This report is based on the reporting requirements in Directive 2003/54/EC articles 3(9), 4 and 23 (1/8), and Directive 2005/89/EC article 7.

NVE is a member of Council of European Energy Regulators (CEER). In 2014, NVE has continued its efforts to contribute to the work of ACER to obtain a well functional electricity market. A formal inclusion of NVE in the Agency for the Cooperation of Energy Regulators (ACER) will be decided as part of the EEA process related to the implementation of the third energy market package. NVE is also a member of the organization for the Nordic energy regulators, NordREG.

The Norwegian National Report 2015 is subject to common reporting structures developed by the Commission and CEER. This report and the National Report of the EU member states will be available on the CEER website www.ceer.eu.

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1 MAIN DEVELOPMENTS IN THE ELECTRICITY MARKET

1.1 Introduction – About the Norwegian Water Resources and Energy Directorate (NVE)

The Norwegian Water Resources and Energy Directorate's (NVE) main statutory objective is to promote social and economic development through an efficient and environmentally sound energy production, as well as promoting efficient and reliable transmission, distribution, trade and efficient use of energy. NVE is responsible for the regulatory area as well as other activities defined by law, regulations and decisions made by the Ministry of Petroleum and Energy (OED).

NVE has been delegated powers according to the Energy Act. NVE has the authority to issue regulations on economic and technical reporting, network revenues, market access and network tariffs, non-discriminatory behavior, customer information, metering, settlement and billing and the organized physical power exchange (Nord Pool Spot). In addition, NVE issues regulations on system responsibility and quality of supply. NVE can take the necessary actions to fulfill the delegated powers according to the Energy Act.

NVE is the national independent regulatory authority for the electricity market in Norway. NVE has no ownership or economic interests in the electricity generation industry. NVE is an independent legal entity with its own budget set by the Parliament and has the authority to act within the scope of its competences. The Department of Energy Market Regulation was established in 2013 in order to prepare for the implementation of the Third Energy Market Package.

NVE has a cooperation agreement with the Competition Authority (concerning i.e. 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. NVE is a member of Council of European Energy Regulators (CEER) and the organization of the Nordic Energy Regulators (NordREG).

1.2 Main developments in 2014

1.2.1 Hydropower production and transmission capacity

The total production of electricity in Norway was 142.3 TWh in 2014. Hydropower production represents the largest share of the electricity production with 96 percent and the Nordic electricity system is therefore highly influenced by the hydrological situation. In 2014, the annual system electricity price was 29.61 EUR/MWh, which represents a reduction of 22 percent from 2013. The highest monthly average system price was in September, after a dry summer with low precipitation. The lowest system price was

in June 2014 due to low seasonal consumption, snow melting that caused high hydropower generation and network maintenance in Southern Norway.

Due to fluctuations in the power situation, technical failures and maintenance, the available transmission capacity between Elspot areas varies over time. The available cross-border capacity between Norway and Sweden as well as Norway and the Netherlands has increased in 2014, mainly due to less maintenance work. The only interconnection with reduced availability was between Southern Norway (NO2) and Western Denmark (DK1) caused by the installation of the Skagerrak IV cable (700 MW HVDC) that opened 29 December 2014. This has increased the total capacity from 1 000 MW to 1700 MW between Denmark and Norway.

1.2.2 Price-coupling

On 4 February 2014, the Nordic day ahead market joined the Price Coupling of Regions, meaning that the European electricity market from Finland to France utilizes the same algorithm for determining market prices and electricity flows.

Market-coupling is an important milestone towards an internal European Energy Market, because it implies more efficient price setting and determination of electricity flows. However, for the Nordic market, the change was not significant since Norway and the Nordic countries have already been closely integrated with the continent the last couple of years through a tight volume coupling.

1.2.3 Improvements in the economic regulation of regional distribution networks

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

An extensive amount of work has been done to upgrade and improve the outputs in the model for benchmarking regional distribution networks. The outputs are reflecting standard costs related to the companies actual network components, and shall describe the cost difference of having different compositions of network components. NVE has a database that contains detailed information about every company's network components. The recent work has been considering what type of costs that shall be reflected in the outputs. NVE has collected new data from the companies to investigate the network components and related costs that best describes the differences in company activities. The work will be completed in 2015, hopefully resulting in an improved benchmarking model to calculate the revenue caps for 2016.

The effect of annually updated cost base and revenue caps, together with the compensation for estimation-error related to the two-year lag (as described chapter 2.1.3), has been relatively large variations in the revenue caps from year to year. Even though these mechanisms ensures recovery of costs for the sector, the unstable allowed revenue makes it challenging for companies to plan their activities. Especially costs related to allocation of pensions have been a source of large variations in the annual cost base. In 2014, NVE has been working on alternative methods to reduce the volatility. Instead

of using yearly pension costs, we suggest to use a 5-year average. NVE also has suggested a change in the method for compensation of estimation-errors in a way that evens out annual variations. These changes has been on public consultation during the summer 2015 and will be included in the model for calculation of revenue caps from 2016.

1.2.4 Implementing a new price comparison tool, national point of data management and smart meters in the retail market

The Norwegian retail market for electricity will undergo formidable changes in the years towards 2019. As part of the goal to further increase competition and efficiency in the market, NVE has developed regulations that facilitate the implementation of a national point of data management (Elhub) and smart metering. The targeted implementation date for Elhub is 20 February 2017, while the smart metering roll-out is set to be completed by January 2019. These changes will make the availability of the exchange of information in the market more efficient, easier access to unbiased price comparison and facilitate the use of demand response tools and services.

In order to provide consumers with adequate information about the electricity market a new price comparison has been launched by the Norwegian Consumer Council 31 August 2015. NVE has established the regulatory framework for this new tool by using legal provisions that enable the collection of information concerning all electricity contracts in the market. The new tool will improve the existing price comparison tool which has been run by the Norwegian Competition Authority since 1998.

NVE is also developing legal frameworks for a combined billing and a supplier centric model in the Norwegian market. A voluntary combined billing regime is planned to enter into force in 2016. Following the planned launch of Elhub 20 February 2017 a more extensive mandatory billing regime may be implemented, which will form the basis for a supplier centric model. Together with Elhub and AMS, these reforms represent the most significant changes to the Norwegian electricity retail market in over two decades.

1.3 Changes in the existing regulation in 2014 and public consultations in 2015

Cross-subsidisation

NVE has adopted new rules for procurement procedures within vertically integrated corporations. The intention is to avoid overpricing and to prevent cross-subsidisation between the DSO and other companies within the same corporation. The rules for such procurements will follow the procedures and threshold amounts deriving from Directive 2014/25/EU (on procurement by entities operating in the water, energy, transport and postal services sectors). The regulation will enter into force 1 July 2016.

Surplus customer – “Prosumer”

NVE has proposed a change in the settlement regulation. The proposal makes it easier for consumers that would like to produce and sell surplus electricity in the market. The prosumer can measure production and consumption in one smart meter. The regulation is expected to enter into force 1 January 2016.

National point of data management - Elhub

NVE has adopted several changes in the settlement regulation in connection with the implementation of the national point of data management (Elhub) and smart metering. NVE has made changes in the regulation on information exchange related to supplier switching, customer change, metering, DSO neutrality, settlement of metering corrections as well as requirements for responsibilities regarding the operation of Elhub. The regulatory changes will enter into force when the Elhub is implemented on 20 February 2017.

New price comparison tool

In order to increase the transparency in the electricity market, the Norwegian Consumer Council has developed a new price comparison tool. In connection with this, NVE proposed new regulation under the Energy Act in 2014 that enables the collection of information for the new price comparison tool. The new regulation significantly improves the ability to collect information about all electricity contracts. It was adopted by the Ministry of Petroleum and Energy, and entered into force 1 April 2015.

Voluntary combined billing

NVE has proposed implementation of voluntary combined billing in 2015. The proposed solution will increase the neutrality of the DSO, and level the playing field between integrated suppliers and independent suppliers.

Mandatory combined billing

Following the implementation of Elhub NVE aims to implement a mandatory combined billing regime, effectively creating a supplier centric model in the Norwegian market. Work on a proposal for a regulatory framework on mandatory combined billing is currently in progress.

Restrictions on advance payments

Following some cases in the market where suppliers were charging disproportionate advance payments, NVE decided to restrict this practice. In 2015 a new regulation was adopted that will enter into force on 1 January 2016. This regulation will maintain companies' ability to offer advance payments but with certain limitations that aim to abolish exploitative practices in the market.

Tariff design for customers in DSO networks

In 2015, NVE arranged a concept hearing regarding changes in the tariff design of DSO networks. The proposal involves a change from energy-based tariffs, to capacity-based tariffs for electricity consumers. A new tariff design is expected to give a reasonable allocation of network costs among users of the network. It is expected that it will contribute to improve incentives for efficient utilization of the network and reduce the need for network investments.

Economic regulation of transmission and distribution networks

The proposed changes in the benchmarking- and revenue-cap models in distribution networks referred to in section 1.2.3, are on public consultation in 2015 and the improvements are planned to be implemented in the regulation from 2016. In addition, NVE has suggested that Statnett (the Norwegian TSO) on a regular basis presents a public report where the main cost developments are described. NVE has asked for feedback on the proposal late 2015.

Nordic Balance Settlement

NVE has adopted several changes in the settlement regulation to facilitate the common Nordic Balance Settlement (NBS). The regulatory changes will enter into force during spring 2016. This joint Nordic NBS is a forerunner in a European context where the Finnish, Swedish and Norwegian TSO's have agreed to combine their balance settlement processes and operation through one organization, eSett.

1.4 Expert committee on network structure and organization

The Norwegian Ministry of Petroleum and Energy nominated an expert committee in 2013 in order to evaluate the structure and organization of the electricity network companies, including proposals for policy instruments and strategies for implementation. NVE participated in the secretariat of the expert committee. The final report was published in May 2014 with the following main proposals:

- Extended Unbundling Requirements: Today network companies with more than 100 000 connected customers have to be legally and functionally unbundled. The committee has however, proposed a legal and functional unbundling for all network companies, irrespective of size.
- Investment Coordination: To promote coordinated and efficient network investments, the committee suggests that network companies in different regions are given extended responsibilities for ranking investment projects based on socio-economic criteria. Any disputes that may arise can be appealed to NVE.
- Extended Connection Obligations: The committee suggests that the network owners' obligation to provide grid access for production units and larger end-users, is extended to include network components from the point of connection to the unit.
- Changes in the Income Cap Regulation: NVE regulates the network operators using an incentive based revenue cap (RC) model. The RC is determined annually, based on a benchmark formula of 40 percent cost recovery and 60 percent cost norm resulting from benchmarking exercises. The committee suggests altering the cost recovery to 30 percent and the cost norm to 70 percent in order to increase the incentives for the network operators to be cost-efficient.
- Cross-subsidisation: The committee states that there is a need for stricter regulation to ensure that transactions of goods and services between network companies and other companies within the same corporation are based on market terms.

NVE will follow up several of the suggestions made by the expert committee in the years to come. NVE has already adopted new rules for procurement procedures within vertically integrated corporations in order to avoid overpricing and to prevent cross-subsidisation between the DSO and other companies within the same corporation (Chapter 1.3).

2 THE ELECTRICITY MARKET

2.1 Network regulation

2.1.1 *Unbundling*

The unbundling requirements for Norwegian network companies has been unchanged in 2014.

In Norway, there is only one TSO, the publicly owned company Statnett, which has been legally unbundled since 1992. In addition, the ownership of the TSO and the publicly owned electricity producer Statkraft, has been divided between two different government ministries since 2002. Norway therefore complies with the requirements in the Electricity Directive 2003/54/EC for ownership unbundling.

DSOs with more than 100 000 connected customers in Norway are legally and functionally unbundled. In 2014, there were seven DSOs in this category, representing 54% percent of total connected customers. In addition to the unbundling requirements, these companies are subject to participation in a compliance program according to the Electricity Directive and Norwegian regulation. The participants of the program have to produce an annual report to NVE that enables NVE to monitor the DSOs fulfilment of the regulations regarding legal and functional unbundling.

146 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 activates 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 seven DSOs with more than 100 000 customers, there are 26 legally unbundled DSOs. All 146 DSOs are under regulations concerning neutral and non-discriminatory behavior 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 are publicly owned.

The Norwegian Ministry of Petroleum and Energy has proposed an amendment to the Energy Act that impose legal and functional unbundling for all DSOs, irrespective of size. The proposed amendment has been on public consultation during the first half of 2015, and will be followed up by a final proposal to the Parliament.

2.1.2 *Technical functioning*

Quality of electricity supply

NVE has extensive legal powers in connection to the regulation of the quality of electricity supply. This involves establishing requirements for all parties connected to the Norwegian electricity system. This includes network companies, the performance of any activities subjected to competition (production, energy trade and/or supply), the TSO, electricity producers and end-users regardless of whether they hold a license according to the Energy Act or not: The Norwegian regulation¹ of quality of supply applies to those who wholly or partially own, operate or use electrical installations or electrical equipment that are connected to the Norwegian power system.

Voltage Quality

The Norwegian Quality of Supply Regulation includes minimum requirements for voltage frequency, supply voltage variations, voltage dips, voltage swells, rapid voltage changes, short- and long term flicker, voltage unbalance and harmonic voltages including total harmonic distortion (THD). If considered necessary, NVE has the power to set minimum requirements for other voltage disturbances as well, such as transient overvoltages, interharmonic voltages and main signalling voltages.

The TSO and DSOs have been required to continuously register dips, swells and rapid voltage changes in their own characteristic high and medium voltage network since 2006. In addition, from 2014, they were obliged to register total harmonic distortion (THD)² and flicker. The purpose of these required registrations is that the TSO and DSOs have an obligation to provide information about the expected quality of their network from existing and possible new customers on request. From 2014 the TSO and DSOs were also obliged to report the abovementioned voltage quality parameters (except rapid voltage changes) to NVE. I.e. the first reporting of voltage quality to NVE was in February 2015. NVE has established a database for all the reported data and publish voltage quality statistics.

In case of a customer complaint regarding power quality, the TSO and DSOs have to do the necessary investigation in order verify conformance with the requirements in the regulations. If the complaint concerns voltage quality, on site measurements must be performed according to relevant EMC-standards (The IEC 61000-series). The minimum duration for such measurements is seven days, longer if necessary. The network conditions in the measurement period (coupling picture, load, production and seasonal conditions) must, as far as possible, reflect the conditions of the network at the time of the complaint. If the measurements prove non-compliance to limits set in the regulation, the TSO and DSOs must identify the reason for this and also identify who is responsible for the violation. The stakeholder who is responsible must rectify the situation without undue delay. In cases where a network-customer (end-user,

¹ Norwegian Regulation of 7th May 2002 No 448 on the System Responsibility in the Power System

² A THD-value expresses a value calculated from all the individual harmonic voltages. A THD-value beyond limits gives an indication that one or more individual harmonic voltages may be beyond limits. If one or more individual harmonic voltages are beyond limits can be annoying for users of the grid and may cause malfunction or damage to equipment connected to the grid.

prosumer, producer or other DSOs) is identified as the responsible party, he or she is exempted from the requirement to rectify if, and only if, no other stakeholder is affected by the voltage violation. If the TSO or DSO have done all the aforementioned investigations without reaching an agreement with the customer, the case can be brought forward to NVE for decision. Decisions made by NVE are individual decisions that can be appealed to the Norwegian Ministry of Petroleum and Energy.

Interruptions

NVE publishes annual statistical reports on interruptions providing continuity of supply levels at a country level, county level, company level, end-user level and voltage levels. Incidents on all voltage levels have been reported since 2014, including voltage levels below 1 kV.

The TSO publishes an annual report on operational disturbances containing reliability levels for the system.

In Norway, the 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 used to be a distribution transformer or an end-user connected above 1 kV. From 2014, a reporting point is defined as an end-user connected to any voltage level, above or below 1 kV. NVE used the “energy not supplied” (ENS) as input to the incentive based regulation on continuity of supply from 2001. The incentive regulation is based on adjusting the income cap for the utilities due to energy not supplied (CENS, in Norwegian “KILE”), among others. Until 2009 this quality adjusting was based on calculating the amount of energy not supplied, and hence a standardized method for calculating ENS was needed. This was introduced from 2000. During 2001-2008 it was a linear relation between ENS and CENS.

After 2009 a new method for calculating CENS was introduced, which is based on the interrupted power (kW) at a reference point of time and then adjusted for the actual interruption time (hour, weekday and month). Calculation of CENS from 2009 is therefore no longer as straightforward as it was when it could directly be derived from CENS.

Even if ENS is no longer used for calculating CENS, it is still an important indicator when making interruption statistics (for instance for making historical plots for the reliability of the power supply)

From 2005, the interruption data also included end-users. The main reasons for introducing this was; (1) easier to understand for non-technical customers and (2) better possibility to compare with other countries.

The reported data is summarized:

- For long (> 3 min) and short (\leq 3min) interruptions (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)
- CENS (from 2009)
- Notified and non-notified interruptions

Common indices with reference to customers are presented in figure 1 & 2. Figure 1 represents long interruptions and figure 2 represents short interruptions (Tables with corresponding figures are enclosed in the appendix).

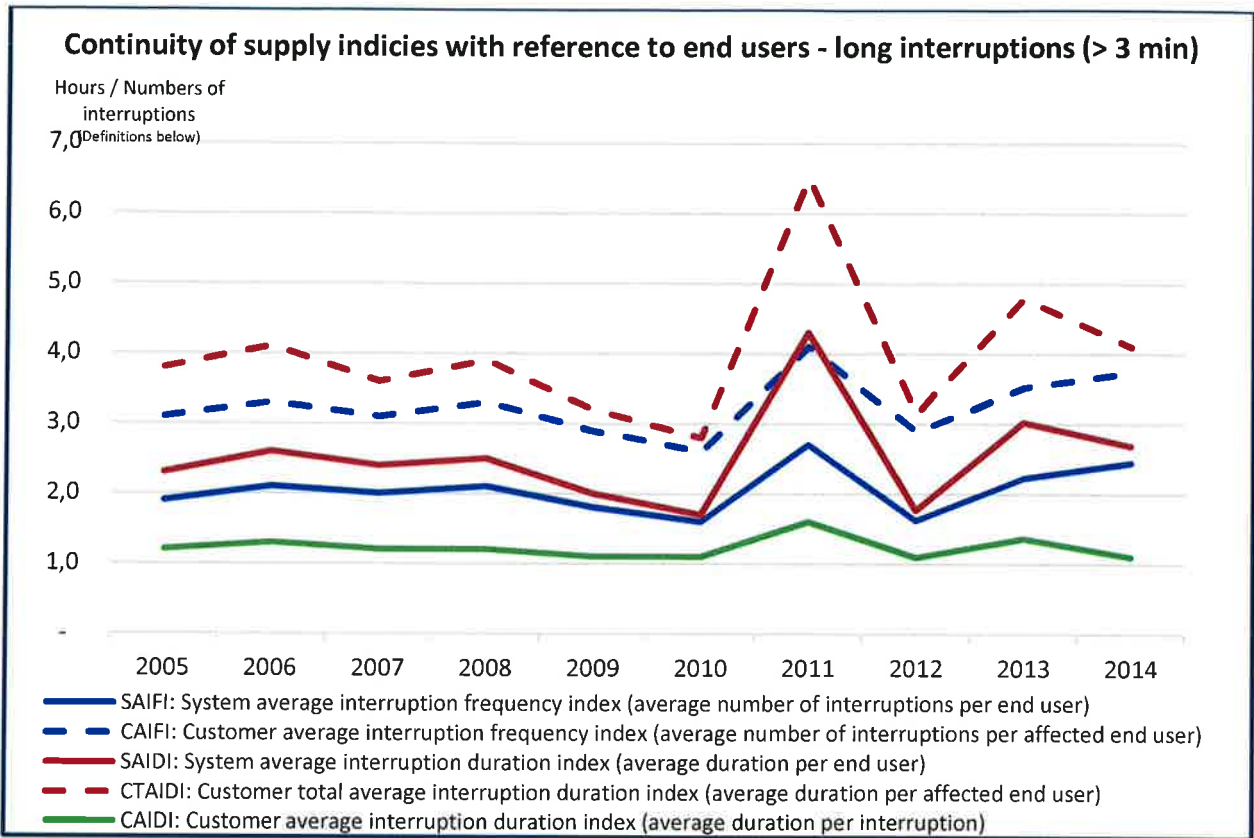


Figure 1. Continuity of supply indices with reference to end users - long interruptions.

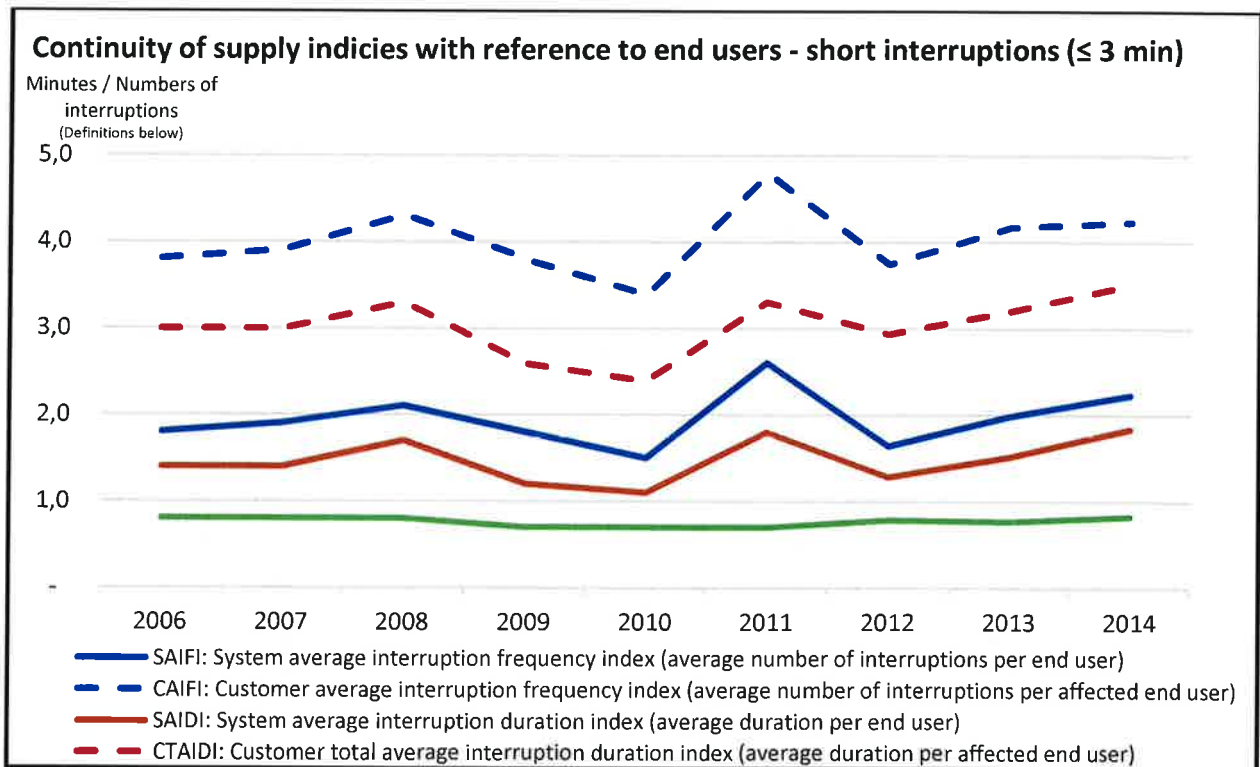


Figure 2. Continuity of supply indices with reference to end users - short interruptions.

Reported “Energy not supplied” in Table 1, is divided into 27 end user groups up to 2008. From 2009, the number of end-user groups has been extended to 36.

Table 1. Energy supplied and some continuity indicators in Norway, long interruptions

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
2014	114 527	4.3	12,4	16,6

Figure 3 shows the development of energy not supplied in per thousand of energy supplied for the last 18 years in Norway.

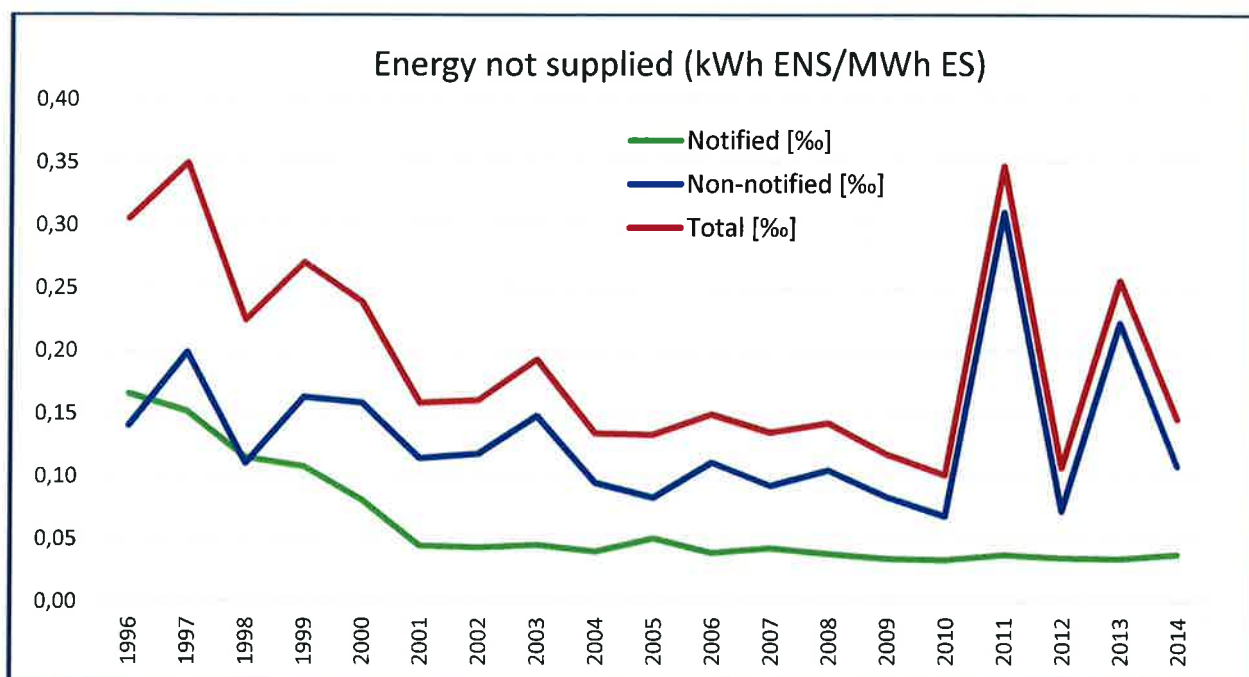


Figure 3. Energy not supplied (ENS) in per thousand of the energy supplied (ES) to end users in Norway since 1996.

In 2003, 2006, 2011 and 2013, several hurricanes caused a high amount of energy not supplied. The amount of energy not supplied in 2014 was lower than in 2013, although storms in the North of Norway and thunder showers in the summer, caused a higher number of interruptions per customer. The outage time per interruption was lower than in 2013, as seen on the values of System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) for long interruptions in figure 1.

Balancing market and balance settlement

The Norwegian TSO (Statnett) holds a license for the system operation responsibility. This obliges Statnett to ensure physical balance between power production and consumption in the operational hour. In performing these tasks, the Nordic balancing market is an important instrument for Statnett.

Norway is a part of an integrated Nordic balancing market, known as “the Nordic regulation power market”. The Nordic area is synchronised and the Nordic TSOs therefore collectively operates the Nordic area as if it were a single control area. 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 electricity regulation price varies close to 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 Norwegian part of the Nordic regulation power market has about 20-30 active participants, where approximately 15 are active on a daily basis.

According to Norwegian regulation, the TSO has the obligation to administer sufficient reserves in the power system at all times. In order to achieve this, Statnett has established an option market (RKOM) to make sure there is sufficient manually activated reserves available on the merit order list of 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 get compensated to make bids in the regulation power market.

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

In 2009, the four Nordic countries implemented a common model for settlement of imbalances, a so-called one-and-a-half price settlement in order to harmonize rules and regulations. 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.

In the recent years NVE has in cooperation with the Swedish regulator EI (Energimarknadsinspektionen) and the Finnish regulator EV (Energiavirasto), worked with the TSOs to prepare for a common Nordic

Balance Settlement (NBS) through a joint company. This will be an important step towards a common Nordic end-user market.

2.1.3 Network tariffs for connection and access

The Norwegian electricity network is characterized as being "distribution", "regional distribution" and "transmission" (central) grid. the transmission network (400kV-132kV), the regional distribution network (132kV-33kV) and the local distribution network (22kV-240V). Statnett is the only Transmission System Operator (TSO) and is responsible for the transmission tariffs. There is a total of 146 network companies owning and operating regional distribution and/or distribution network, some also owning minor parts of the transmission network.

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 benchmark exercises. There is a two-year lag on the cost data. The regulation model concerns operators of all networks. Statnett is benchmarked together with other European TSOs⁴, 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 network and one model comparing companies operating in the local distribution network. The DEA-results are adjusted using regression-analyses to take into account the differences in geographical challenges between the companies. 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 every 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, any errors in the companies' cost or technical data discovered after the notification, are corrected in the final RC.

The RCs are calculated based on expected total costs using inflation adjusted 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 2014 will be corrected in the RC for 2016). 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.

⁴ e3Grid2012 European TSO Benchmarking Study

Allowed Revenue

The companies set their tariffs based on their allowed revenue, which is the revenue cap, with addition to costs related to property tax, approved R&D costs and tariffs paid to other regulated networks. 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 are included in the RC added to the allowed revenues.

Further, any Costs of Energy Not Supplied (CENS) 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 an incentive for network operators to have a socio-economic maintenance and investment level in order to minimize 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 a 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 in order 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 a network company and other companies in the same corporation needs to be based on competitive market conditions. Further, the national regulator may impose a specific method for cost allocation between areas of operation in vertically integrated companies. NVE annually audits a selection of the companies to reveal any possible cross subsidies.

Improvements in the economic regulation of regional distribution networks

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

An extensive amount of work has been done to upgrade and improve the outputs in the model for benchmarking regional distribution network. The outputs are reflecting standard costs related to the company's actual network components, and shall describe the cost difference of having different compositions of network components. NVE has a database that contains detailed information about every company's network components. The database is updated yearly. The recent work has been to consider what type of costs that shall be reflected in the outputs. NVE has collected a lot of new data from the companies to investigate what kind of network components and related costs that best describe the differences in the companies tasks. The work will be finished in 2015, hopefully resulting in an improved benchmarking model to calculate the revenue caps for 2016.

The effect of annually updated cost base and revenue caps, together with the compensation for estimation-error related to the two-year lag (as described in the section about the Revenue Cap Model above), has been relatively large variations in the revenue caps from year to year. Even though these mechanisms ensures recovery of costs for the sector, the unstable allowed revenue makes it difficult for the companies to plan activities. Especially costs related to allocation of pensions has been a source of large variations in the annual cost base. During 2014, NVE has worked with alternative methods to even out this volatility. Instead of using yearly pension costs, we suggest to use a 5-years average. NVE also has suggested to change the method for compensation of estimation-errors in a way that evens out annual variations. These changes is on public consultation during the summer 2015 and, depending on the outcome, will be included in the model for calculation of revenue caps from 2016.

NVE has been looking at the cost-efficiency of companies with different organizational governance. Among the 146 companies, 80 are vertically integrated with power production and/or sale. These are also in average smaller companies. The vertically integrated companies have lower average rate of return than the companies only operating in network-related activities. Regression analysis shows that vertically integrated companies have 15 percent higher operational costs, but this may be due to economies of scale. They also have a lower average efficiency score in the DEA- and regression-analyses. Many of the 146 companies are doing work related to broadband etc. Analyses show that such activities might lead to less efficient network operation.

Tariff determination

The tariff requirements and calculation methodology are subject to NVE regulation. All network companies are responsible for determining tariffs within their income cap according to the regulation on tariff structure. The tariff level are to be fixed in a way that stimulates efficient utilization and development of the network, and in a way that is non-discriminating. Tariffs can be differentiated based on network related criteria that are objective and verifiable.

All tariffs are based on costs referring to the consumer's connection point. An agreement with the network company at the point of connection shall provide access to the entire network system and the power market. Since 2010, all houses, apartments and vacation homes are to be metered and settled individually.

According to the regulation on tariff structure, tariffs consist of a usage- dependent energy component set on the basis of marginal network losses, and a fixed annual amount per customer. The fixed component shall cover customer-specific costs and network costs that are not covered by the usage-dependent tariff components.

The Norwegian TSO levies a locational charge for marginal losses to all users of the system. The marginal loss factors are recalculated weekly in order to reflect changing of system conditions. In points with both output and input, loss rates shall be symmetrical around zero. In areas with a production surplus, input has a positive loss rate and outtake a negative loss rate, and vice versa. The marginal loss rates are administratively restricted to 15 percent.

Consumption in the transmission network is charged with an energy component based on marginal network losses and a fixed component that depends on proximity to power production plants and the amount of load that can be disconnected in a given response time.

Consumers in the distribution network are charged a fixed component that covers customer-specific costs and a share of the other fixed costs in the network. The network company shall prepare separate tariffs for high-voltage and low-voltage. The energy component for customers without maximum demand metering in the distribution network may in addition to network losses also cover a share of the other fixed costs in the network.

In 2014 a household customer paid an average 0.37 NOK/kWh (0.05 €/kWh⁵) and a fixed component of 1.922 NOK/year (240.25 €/year) including VAT and consumer tax⁶. The corresponding numbers in 2013 were 0.36 NOK/kWh (0.05 €/kWh) and 1.941 NOK/year (242.63 €/year)⁷. Excluding taxes a household consumer paid an average of 0.18 NOK/kWh (0.02 €/kWh) and 1.604 NOK/year (200.5 €/year).

Producer tariffs consist of an energy component that varies with the customer's current input, and a fixed component. The tariff is independent of the recipient of the power.

The energy component depends on the producer's current input of energy. The energy component is calculated individually for each separate input point and is determined on basis of marginal network losses in the whole network system.

The fixed component for producers connected to the transmission level, set by Statnett, shall be normative for the fixed component for producers connected to the regional and distribution networks. In 2014, the fixed component was 0.12 NOK/kWh, which included a G-charge of 0.1 NOK/kWh and 0.02 NOK/kWh for costs related to ancillary services. Settled production volume shall be based on the power plant's median annual output the last ten years. For power plants with installed capacity below 1 MW, settled volume shall as a maximum be 30 per cent of installed load capacity multiplied by 5 000 hours.

Since March 2010, NVE has given a general dispensation to simplify the processes related to end-use customers that generate electricity for their own consumption, and in some hours have a surplus ("prosumers"). The dispensation simplifies the process of selling surplus electricity back to the network. The dispensation implies that the local network company can purchase the surplus electricity and a simplified input tariff. It is not mandatory to offer the suggested arrangement for handling smart-customers to the network company. Generation that requires licensing or producers that supply electricity to other end-users are not covered by the dispensation.

In 2014, NVE initiated work on incorporating provisions regarding prosumers in the current regulation. Suggestions for regulation of prosumers have been on public consultation in 2014 with an additional consultation in 2015.

Network companies may require a connection charge to cover the costs of connecting new customers to the network or cost of reinforcing the network for existing customers. The connection charges are "shallow" because it is not allowed to set connection charges for investments in the meshed network. The objective of the connection charge is to make the customer responsible for the costs related to a new connection or an upgrade of the customer's existing network connection. Costs not covered by the responsible customer, but by the network company will increase the network company's allowed income, and hence, be dispersed to all customers through increased tariffs.

⁵ Exchange rate 1 € = 8 NOK

⁶ 0.18 NOK/kWh (0.02 €/kWh) and 1 591 NOK/year (198.88 €/year) excluding taxes.

⁷ 0.18 NOK/kWh (0.02 €/kWh) and 1 604 NOK/year (200.5 €/year) excluding taxes.

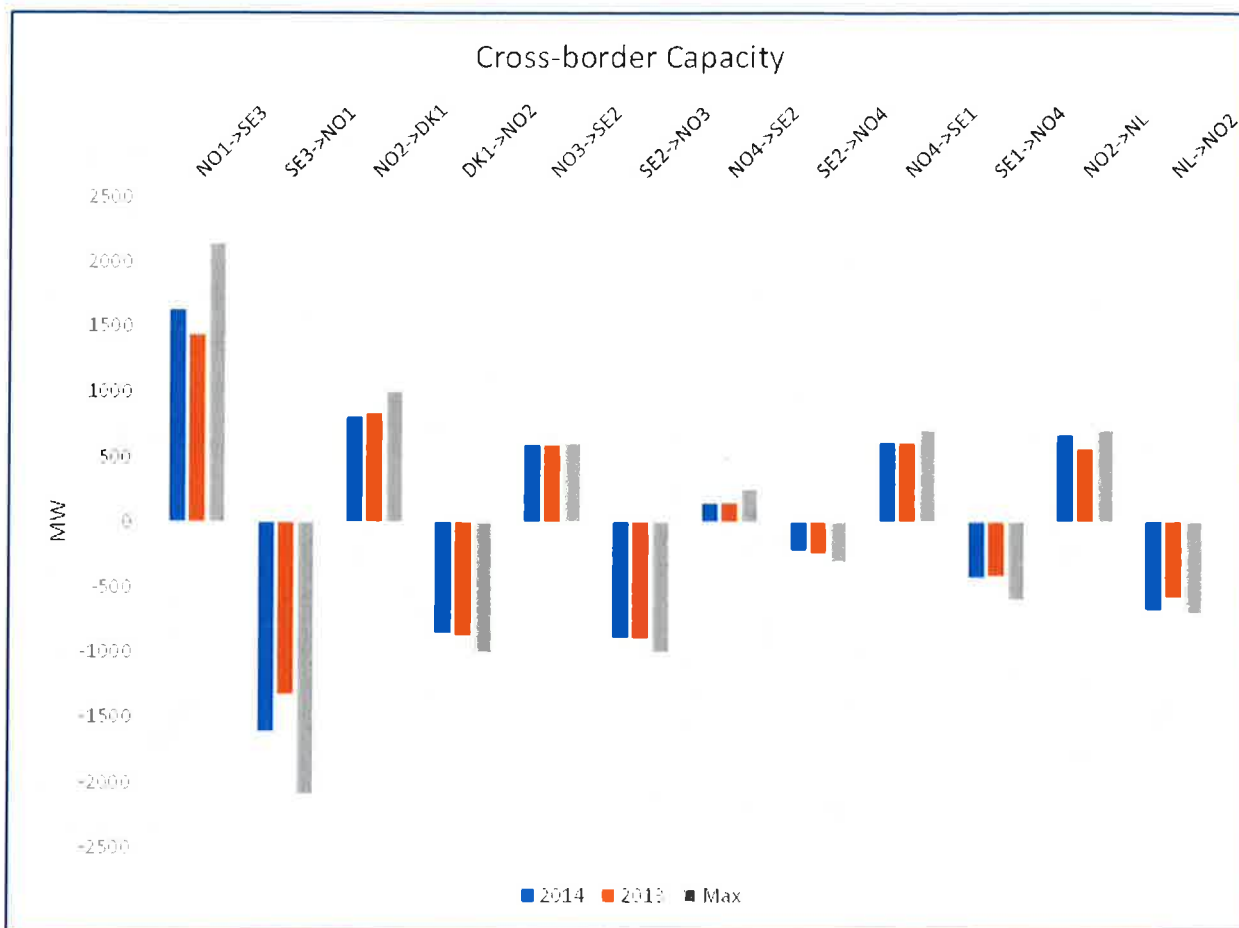


Figure 5. Available capacity in 2014 and 2013 as a portion of installed capacity for each interconnector. Negative capacity represents export capacity from a Norwegian Elspot area. Source: Nord Pool Spot and SKM Syspower.

Available cross-border capacity in the market has improved between Norway and Sweden and Norway and the Netherlands from 2013 to 2014. Less maintenance work is the main reason for the increase.

The only interconnection with reduced availability from 2013 to 2014 was between Southern Norway (NO2) and Western Denmark (DK1). The connection of the fourth cable between Norway and Denmark, Skagerrak 4 (700 MW) explains the reduced capacity in 2014. The work to expand capacity on the Norway-Denmark interconnector meant somewhat reduced availability to the market in periods. The new cable, Skagerrak 4, was available to the market on 29 December 2014, which has increased the total installed capacity between Norway and Denmark up to 1700 MW.

The available cross-border capacity between Mid- (NO3) and North-Norway (NO4) and Sweden was unchanged from 2013 to 2014. 47 percent of the installed export capacity from Northern Norway to Sweden was available to the market, whereas 64 percent of the installed capacity was available for imports. The relative weak network in Northern Norway, which is also subject to rough weather conditions, explains the large share of unavailable capacity.

Price differences

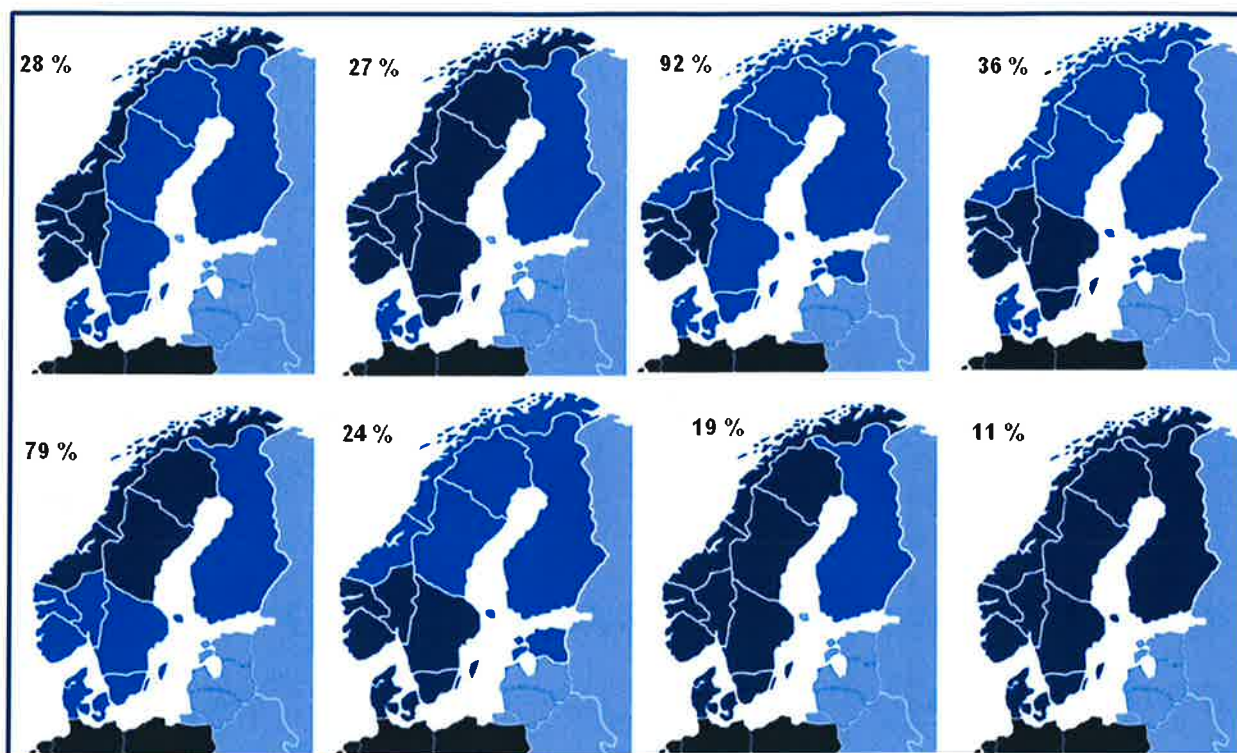


Figure 6: Dark blue denotes the Elspot areas with equal prices in 2014, measured in percentages of all hours. Source: SKM Syspower and Nord Pool Spot

The Nordic system is divided into bidding zones, which reflect structural congestions in the network. This gives the most correct price signals of supply and demand given network constraints, and is an efficient way of handling congestions in the network. Nord Pool Spot, the common power exchange, yields a system price based on the areas prices, and there is a high correlation between the system price and the individual area prices. This relationship is addressed in the next chapter “Competition in the wholesale market”. Price differences between areas indicate congestions between areas. The figure above does, however not show the size of the price differences. In a large proportion of hours, the price differences are limited. In the entire Nord Pool area there was equal prices in 11 percent of all hours in 2014. The remaining part of the hours had one or more price difference (congestion) between bidding zones, but as the figure above show: These are then usually divided into relatively large subareas with equal prices. Northern Norway (NO3, NO4) and Northern Sweden (SE1, SE2) had equal prices 79 percent of all hours, signaling that the congestions were limited between these bidding zones. Southern Norway (NO1, NO2, NO5) and Southern Sweden (SE3, SE4) had equal prices in 36 percent of all hours, while Southern Norway had equal prices 92 percent of the time.

Norway had equal prices in all five Elspot areas in 28 percent of 2014 and equal prices with Sweden in 27 percent of all the hours last year. This indicates that there is a congestion between Norway and Sweden, and North and South Norway. The latter prevents price equality internally in Norway, but this is expected to be improved with the completion of the 420 kV Ørskog-Sogndal line between NO5 and NO3.

2.1.5 Compliance

DSOs

NVE monitors network companies and ensures compliance with the neutrality criteria and other relevant regulations according to the Energy Act. NVE has the authority to use sanctions such as for example fines in cases of non-compliance. DSOs with more than 100.000 customers participates in a compliance program in order 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 program requirement only affects DSOs that have a vertically integrated electricity generation and distribution in their corporate structure.

According to the Electricity Directive 2003/54/EC, network and supply companies can be bundled if the number of customers (both residential and business customers) does not exceed 100.000. To avoid cross-subsidisation and discrimination of electricity suppliers, NVE regulates these bundled companies. The neutrality criteria requires a clear separation of monopolistic network activities and activities related to electricity production and sales. Further, the DSOs have a responsibility to give the retail market customers sufficient relevant information about supplier competition in the market.

2.2 Promoting Competition

2.2.1 Wholesale markets

The Norwegian wholesale electricity market has been an integrated part of the Nordic market since the mid 1990s. In recent years, the Baltic market area has been integrated in the Nordic market. The Nordic electricity exchange, Nord Pool Spot (NPS) organizes and operates the day-ahead and intraday markets based on implicit auctions. Trading capacities not utilized in the day-ahead market are made available in the intraday market.

The day ahead market at NPS covers all bidding zones of Norway, Sweden, Finland, Estonia, Latvia and Lithuania. Market participants at NPS consists of 361 member companies from 20 different countries. The total day ahead traded volume in 2014 was 361 TWh (349 TWh in 2013). This volume constitutes a market share of 84 percent of the regions total consumption. Many market participants and high market share indicates good liquidity and a well-functioning market, which in turn 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 for long term financial trading and hedging contracts in the Nordic market. The System price denotes the unconstrained market clearing price for all bidding zones in the Nordic countries. For most bidding zones there is a high correlation between the area prices and the system price, enabling market participants to hedge directly towards the system price.

The main market for long term financial hedging is organised by Nasdaq OMX and is regulated by the Financial Supervisory Authority. The Exchange listed derivatives refers to both the Nordic System price

and bidding zone prices. Different combinations of listed derivatives represent both zonal and cross-zonal hedging opportunities covering all Nordic bidding zones. NOMX also offers derivatives of German, Dutch and UK electricity, carbon emissions and electricity certificates. NOMXs Nordic power contracts (on order book) amounted to 867 TWh in 2014, compared to 888 TWh in 2013. The total clearing turnover for the Nordic financial power contracts was approximately 1.500 TWh in 2014, which is a multiple of the underlying physical power trade and indicates a highly liquid market in electricity derivatives.

2.2.1.1 Price monitoring

NVE monitors the price developments by analysing and publishing weekly and quarterly reports of the Norwegian and Nordic electricity market development. These reports contain a description of wholesale electricity prices, both system price and price differences across price areas, the hydrological situation, power generation, consumption, and cross border exchange.

Figure 7 below shows the development in the daily Nordic system price in 2014 and 2013. The annual system price decreased 22 percent from 2013 to 29.61 EUR/MWh in 2014. That is close to the average price of 2012 at 31.20 EUR/MWh. The highest monthly average system price occurred in September, after a dry summer with low precipitation. The lowest system price in 2014 was in June due to low seasonal consumption in the Nordic countries. In addition, snow melting caused high hydropower production.

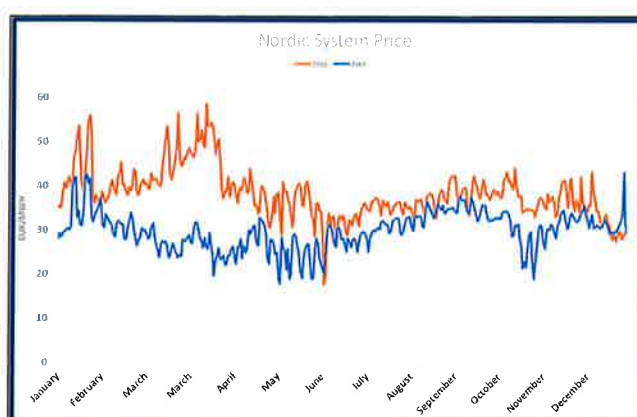


Figure 7. Nordic System price 2014 and 2013, EUR/ MWh.

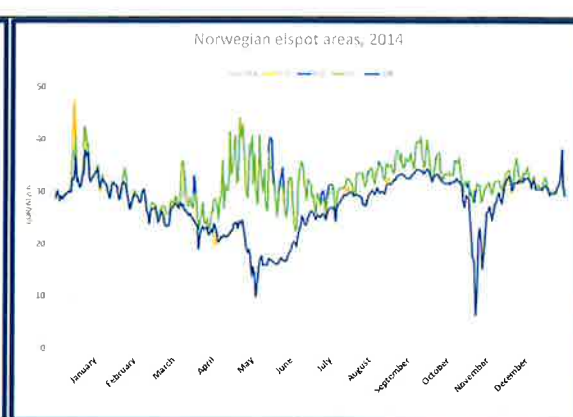


Figure 8. Price developments in Norwegian bidding zones in 2014. Source: Nord Pool Spot and SKM Sympower.

Figure 8 shows the price developments in the Norwegian 5 bidding zones during 2014, whereas table 2 (below) shows the annual area prices. There was a reduction in prices in all bidding zones in 2014 compared to 2013. In southern Norway, the annual prices were reduced more than the system price with price levels at 27-28 percent below the 2013 prices. In Northern Norway however, the reduction in prices was slightly lower than the reduction in the system price, with a 19 percent reduction.

The area prices in Norway followed a seasonal pattern, with relative high prices in the first winter quarter. High intermittent power production during the snow-melting period from April to the end of June in Southern Norway (NO1 and NO2) caused a dip in prices. Network maintenance on the border to Sweden and work in connection with SK4 cable, limiting the exports of surplus power contributed to the low prices. Northern Norway (NO3, NO4) was in this period more connected to the Swedish price areas, and thus had higher prices. After a hot and dry summer, prices increased steadily until the autumn rain caused prices

to drop due to higher hydropower production. Prices rose again as lower temperatures increased consumption and inflow to hydropower reservoirs declined.

Table 2: Annual prices in the Norwegian Elspot areas, €/MWh

€/MWh	2014	2013	Change (%)
East Norway (NO1)	27,3	37,6	-27 %
South West Norway (NO2)	27,2	37,3	-27 %
Mid Norway (NO3)	31,5	39,0	-19 %
North Norway (NO4)	31,4	38,6	-19 %
West Norway (NO5)	27,1	37,6	-28 %

The price developments at NPS can be explained by changes in fundamental factors such as variation in precipitation, hydro reservoir levels, inflow, wind and temperature. The figures 9 and 10 below show the weekly developments of temperature and hydro reservoir levels.

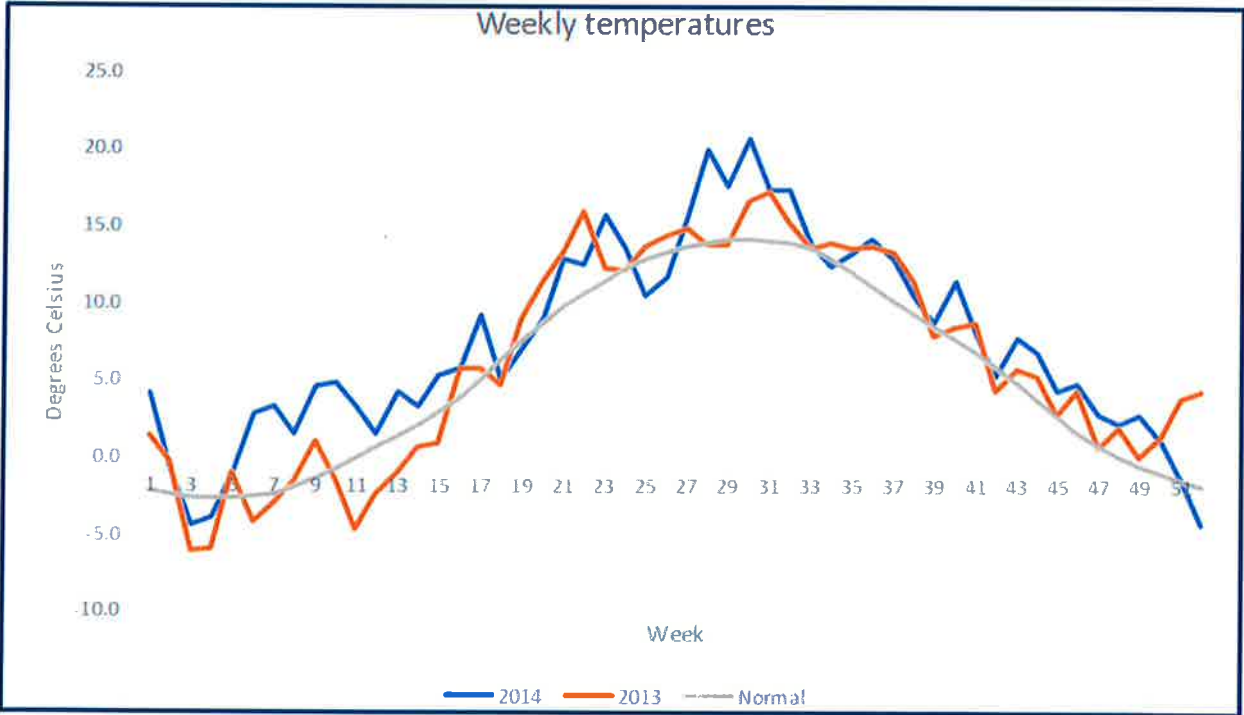


Figure 9. Average weekly temperatures for the cities Oslo, Bergen, Trondheim and Tromsø in 2014 and 2013 compared to normal. Source: SKM Syspower.

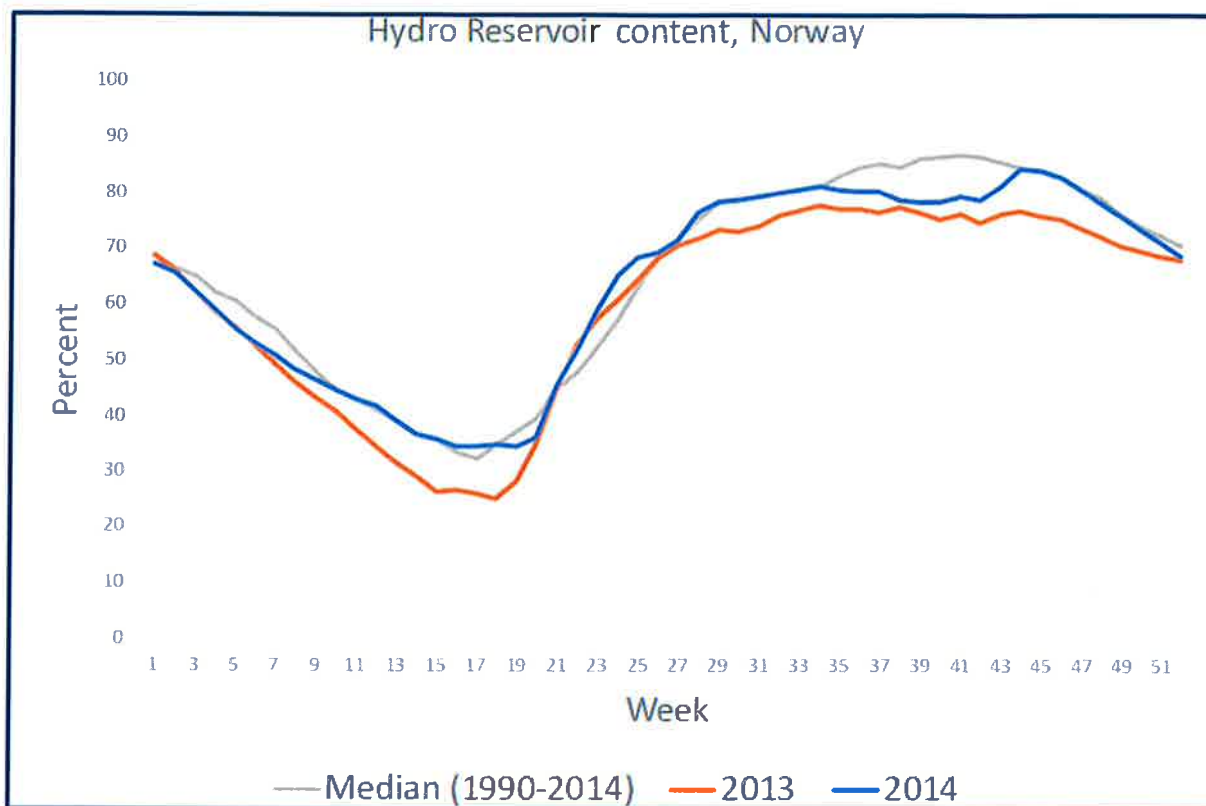


Figure 10. Hydro reservoir levels in Norway. 100 percent represents 82 TWh. Source: NVE

In the beginning of 2014, the hydro reservoir levels were 67.1 percent, which is a normal level (median) and approximately the same as in 2013 (68.1 percent). The winter temperatures were higher than normal in 2014. A consequence of this is that the electricity consumption was lower in 2014, thus the reservoirs were not emptied as fast as in 2013. In addition, higher temperatures caused more precipitation to fall as rain and snow melting, and thereby increasing the hydro reservoirs more than normal during the wintertime. The snow reservoirs were also larger in 2014 than in 2013, which gave a higher level of energy inflow into the reservoirs. Most of the snow was distributed in Southern Norway, which can explain part of the price difference between the North and South of Norway. Lower consumption and more energy flowing into the hydro reservoirs contributed to reduced prices in 2014.

The warm and dry summer of 2014 caused a stable development in the hydro reservoirs throughout the summer. The lack of rain was to some degree alleviated by an increase in glacial melting, but the energy stored in the reservoirs by the end of the summer was still less than what is normally expected. The negative hydrological balance was one reason that September was the month with the highest system price.

High precipitation in October and November led to a sharp rise in the hydro reservoir filling. Threat of overflow of the reservoirs in Southern Norway brought the overall reservoir levels back to normal. Northern Norway, on the other hand, received less snow than Southern Norway during the course of the winter 2013/2014, and had lower reservoir levels than normal after the snow melting season at the end of year.

With regard to price monitoring in the wholesale market, NVE supports the Norwegian Competition Authority in monitoring Norwegian generators' bidding behavior at NPS. Price differences that can't be explained as price-taker behavior is investigated by looking at the different participants' bidding in the

market place. As a part of this process, NVE has the mandate to collect information about the bidding from NPS and production plans from the TSO.

2.2.1.2 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.

NPS regulates market conduct through the NPS Rulebook. The rulebook is a set of private law agreements. 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 NOMX are obliged to provide an internal market surveillance.
- The market surveillances of NPS and NOMX cooperate to monitor the participants' behavior to ensure an efficient financial and physical power market. Regular meetings and information exchange between the physical and financial market surveillance teams ensure monitoring and disclosure of possible cross market manipulation.
- NPS Market surveillance must ensure that market participants adhere to the rules to maintain the markets confidence in the exchange. The Rulebook for trading at NPS regulates market conduct in the physical market with regard 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 the 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' market conduct rules, participants and clearing customers shall disclose any information regarding:

- (a) Any outage, limitation, expansion or dismantling of capacity of 100 MW or more for one Generation Unit or Consumption Unit, or 100 MW or more for one Production Unit with an installed capacity of 200 MW or more, for the current year and three (3) calendar years forward, including updates of such information;
- (b) Any outage, limitation, expansion or dismantling of capacity in the transmission network affecting cross zonal capacities by 100 MW or more, for the current year and three (3) calendar years forward, including updates of such information;
- (c) Any outage, limitation, expansion or dismantling of capacity in the transmission network that reduce power feed-in and/or consumption by 100 MW or more, for the current year and three (3) calendar years forward, including updates of such information;
- (d) Any erroneous or missing Orders in the Elspot market of 200 MW or more;
- (e) Any information that is likely to significantly affect the prices of one or more derivatives based on Products if made public.
- (f) Any Inside Information not covered by sub-paragraph (a) to (e) above

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

2.2.2 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 licenses whenever necessary. The licensing regime is light and transparent and does not represent an undue barrier to competition or entry in the market. The trading license is the basis for NVEs supervision and regulation of market actors through the Energy Act regulation. A trading license is required to become a balance responsible party and to trade at the Nordic power exchange.

NVE renewed trading licences for actors in the Norwegian market in Q4 2014, as the licensing period from 2011-2014 ended. At the end of 2014, about 530 companies were holding a trading license or were in the process of obtaining one. The new licensing period is 1 January 2015 to 31 December 2018. Of the companies that were granted a license in 2014, 136 were electricity suppliers supplying residential customers, while 146 were DSOs.

Since the liberalization 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 network area. On average, the dominant supplier has a market share of about 70 percent of residential customers within its own network area. This share has been stable throughout 2014.

In order to increase the efficiency in the market, NVE has proposed implementation of voluntary combined billing in 2015. The proposed solution is expected to increase the neutrality of the DSO, and level the playing field between integrated suppliers and independent suppliers. Following the implementation of Elhub NVE also aims to implement a mandatory combined billing regime, effectively creating a supplier centric model in the Norwegian market.

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

In 2014, the Norwegian Competition Authority was responsible for the national price comparison website for electricity contracts, as they have been since 1998. The website offered price comparisons within three clearly defined types of contracts, and assisted the customer in evaluating the offers presented and choose a supplier. On 31 August 2015 a new and more comprehensive price comparison tool was launched. The new tool provided by the Norwegian Consumer Council contains information about all offers available in the market. It visualizes the estimated total cost of energy including network tariffs and taxes, provided that customer's knows his or her yearly consumption. 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.

NVE regulates the collection of information for the Consumer Council's new price comparison tool under Energy Act regulations. Many suppliers that offer contractual terms have made their contracts ineligible for presentation on the price comparison website provided by the Competition Authority. Thus, many contracts offered in the market were not available for comparison in 2014. It has been important for NVE when assisting the Consumer Council in the development of the new price comparison tool that all contracts in the market are presented in the price comparison tool. This includes contracts that are not actively offered in the market, but still have customers tied to them. This enables customers on contracts that are no longer available in the market to compare their contract against the best offers available.

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 in the energy market.

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 are collected from the Norwegian Competition Authority and Nord Pool Spot. The data are processed with the intention of presenting a 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 are published in a weekly report on NVE's website, and are regularly referred to by the public media. NVE also publishes similar retail market data in a quarterly report on the energy market.

As of January 2012, a mandatory support scheme 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 scheme receive one electricity certificate 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 scheme, as the supplier's costs of purchasing the certificates are added to the electricity price.

Electricity suppliers are required to refer to NVE's website to inform their customers about the costs imposed by the electricity certificate obligation.

In 2014, electricity consumers paid for electricity certificates amounting to 6.9 percent of their total electricity consumption. This share will steadily increase towards 2020 where it reaches its peak at 18.3 percent of the total annual electricity consumption. The actual additional cost paid by the consumers in 2014 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 1.6 øre/kWh due to electricity certificates in 2014. This means that a residency using 20 000 kWh of electricity in 2014, paid a total cost of 320 NOK (excluding VAT).

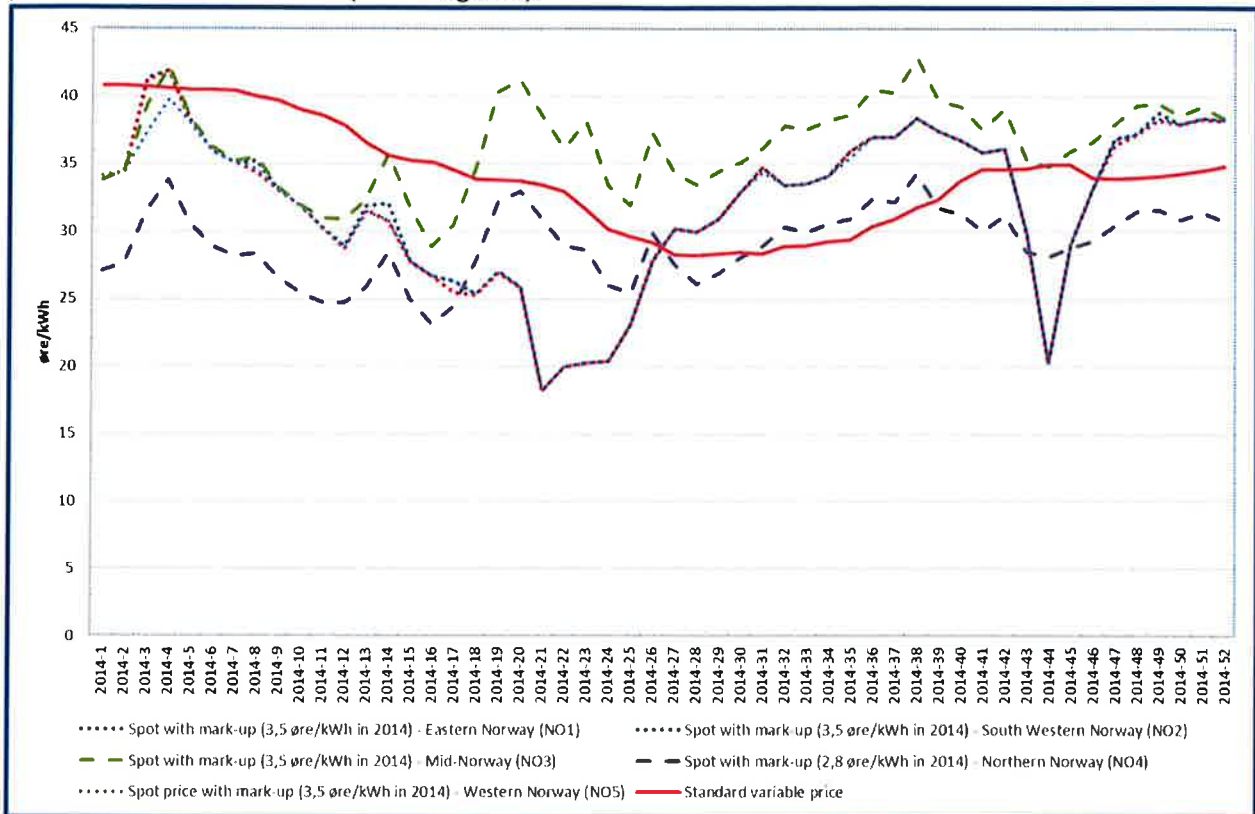


Figure 11. Average price development for the spot contract in the five Norwegian bidding zones

The figure above shows the average price development throughout 2014 for the spot contracts in the five Norwegian bidding zones of the Nord Pool Spot power exchange, together with the standard variable contract⁹. 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.

The listed prices in the figure include VAT and a mark-up of 3.5 øre/kWh, except for the el-spot area Northern Norway, where the price excludes VAT and includes a mark-up of 2.8 øre/kWh. The mark-ups are calculated by NVE to represent an average mark-up for spot-price contracts offered in the market. The mark-up used for contracts in Northern Norway is lower as this area of Norway is exempted from VAT on electricity.

⁹ 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.

In the retail market, general competition legislation (The Norwegian Competition Act and the competition rules applicable through 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 Civil Commissioner.

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

The Norwegian retail market for electricity will face substantial changes in the coming years. As part of the goal to further increase competition and efficiency in the market, a national point of data management (Elhub) and smart metering will be implemented. The targeted implementation date for Elhub is 20 February 2017 and the smart meter roll-out is set to be completed by 1 January 2019. The implementation of Elhub will standardize the exchange of hourly metering data, simplifying the communication of metering data in the chain between DSOs, suppliers and consumers. NVE considers active, well-informed consumers to be key for the Norwegian retail market. Smart meters are expected to provide real-time consumption data, and price signals that give incentive for energy efficiency and peak load management, by enabling consumers to adjust consumption to price variations.

NVE is also assessing the implementation of supplier centric model for the Norwegian retail market, in accordance with NordREG recommendations. The implementation of a supplier centric model is key to simplifying the retail market for consumers and is considered a necessary step in the harmonization of Nordic retail markets for electricity. The model under consideration by NVE includes a combined billing regime, which will simplify the market structure and make it easier for consumers to engage in the electricity market. A supplier centric model is expected to reduce barriers to switching. In 2014, NVE commissioned a cost-benefit analysis to assess the proposed market model and clarifying issues that borders other jurisdictions, such as financial regulation.

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 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 2 539 100. Among residential customers, there were approximately 337 000 supplier switches in 2014. This equals a switching rate of 13.2% among household customers.

A report from 2011 revealed that 60 percent of Norwegian consumers had a contract that was not presented on the national price comparison website provided by the Competition Authority. On average, the contracts not presented on the website were more expensive than the ones that were presented. 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 2015.

In order to provide consumers with adequate information about the electricity market a new price comparison tool was launched by the Norwegian Consumer Council in 2015. NVE has established the regulatory framework for this new tool by bringing in regulations under the Energy Act that enables the collection of information about all electricity contracts in the market. On 31 August 2015, the new tool replaced the price comparison tool which has been provided by the Norwegian Competition Authority since 1998.

2.3 Security of supply

2.3.1 Monitoring balance of supply and demand

Contingency planning and preparedness

The large share of hydropower 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.

The individual network 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 and by NVE on possible development in energy and power balance. When it comes to monitoring the market development NVE publish regular reports describing the development.

In normal operation strained situations or during operational disturbances

Through the Norwegian regulation, 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 network can only be installed and operated based on decisions made by the TSO.

Norway's special regulations for highly critical power situations

Statnett is responsible for the operation of the power system, also during extreme occurrences. NVE is head of the preparedness and emergency planning of the power supply and is also the rationing authority. Regulations relating to power system operation regarding handling of extreme situations came into force 1 January 2005. This regulation aims to secure 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 is obliged to inform NVE of its different findings. NVE approves of different measures with conditions before they enter into force. Permanent- and operations cost for the different measures are handled within Statnetts revenue cap. According to Norwegian

regulation Statnett can develop the different remedial actions within the terms of the regulation on system operation based on the following set of terms:

- To reduce risk, but not completely eliminate the probability for electricity rationing.
- 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 the TSO 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 can be 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 approved measures can only be activated after decision from NVE. The measures will only be activated in a situation where physical rationing of electricity supply is considered likely. The approved measures has not been applied in Norway.

Electricity peak demand

Domestic gross energy consumption was 126.7 TWh in 2014 (129.2 TWh in 2013).

The Norwegian peak demand occurs during winter season. The current historical peak electricity demand is 24 180 MW, measured in January 2013.

Table 3. Peak demand for the last 10 seasons.

Peak demand for the last 10 seasons				
Year	Weekday	Date	Hour	Demand (MW)
2005	Wednesday	02.03.05	9	21 401
2006	Monday	06.03.06	9	21 575
2007	Wednesday	14.12.07	9	21 588
2008	Thursday	14.02.08	10	21 589
2009	Monday	05.01.09	9	21 984
2010	Wednesday	06.01.10	9	23 994
2011	Monday	21.02.11	9	22 129
2012	Wednesday	05.12.12	9	23 443
2013	Wednesday	23.01.13	9	24 180
2014	Thursday	22.01.14	10	23 489

According to demand forecast developed by the Norwegian TSO, the expected peak demand for Norway winter season 2014/2015 was expected to be 25 000 MW with temperatures corresponding to a ten years

winter day. The same forecast based on average winter temperatures shows an expected peak demand of 23 330 MW.

Currently available generation capacity

The Norwegian net electricity production was 142.3 TWh in 2014 (134.2 TWh in 2013). Hydropower production represents the largest share of the electricity production with 96 percent. The mean annual generation from hydro- and wind power was 134.4 TWh. This is the simulated production with the existing power plants at the end of 2014, and the mean inflow and wind from the years 1981-2010. The maximum annual generation from thermal power is about 4.2 TWh, including internal production. The inflow used for hydropower generation varies between 90 and 150 TWh, dependent on the precipitation from one year to another.

Total installed generation capacity (at the end of 2014) was 32 573 MW. Available generation capacity during a cold winter is about 25 000 MW.

	Installed capacity 31.12.2014	Mean annual generation 31.12.2014	Net capacity added in 2014	Expected increase in capacity in 2015	Under construction pr 31.12.2014	License/permit given, not yet built
	[MW]	[TWh/y]	[MW]	[MW]	[MW]	[MW]
Wind power	856	2,4	45	2,8	2,8	3 467
Hydro power	31 082	132	143	162	663	1 633
Thermal power	633*	4,2**	-407	0	0	1 380
Solar Power	1,7	0,0014	N/A	0	N/A	0

Table 4. 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).

The hydropower generation capacity has increased by approximately 143 MW in 2014 and 45 MW wind power generation capacity has been installed. The gas fired power plant Kårstø (430 MW) is regarded as cold reserve due to unfavorable market conditions. The expected start-up time is one year, so this plant is no longer included in the statistics of installed thermal capacity. According to NVEs best estimates, the total accumulated solar power in Norway is 12.8 MW, but only 1.7 MW is connected to the network.

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

NVE has delegated the responsibility for power system planning in Norway to 17 owners of the distribution network (33 – 132 kV) that are responsible planning the distribution network in 17 specific areas. The Norwegian TSO is responsible for operation and planning of the national transmission network (132 kV-420 kV).

Every second year the responsible utilities in the distribution planning areas and Statnett make an updated regional network development report. The timeframe for the network development is a minimum of 20 years. The power system report must describe today's network, future transmission conditions together with anticipated measures and investments. The report includes presentations of statistics with characteristics of generation, transmission and consumption of electricity, and includes conditions that are of importance and of relevance for the development of the power system in the designated area. Simplified socio-economic analysis must be presented for all network investments that require

environmental impact assessment (EIA). The main objective of power system studies is to contribute to a socioeconomic rational development of the regional distribution networks and the transmission network.

The power system studies are submitted to NVE for consent. 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 processing of the applications for a license to energy plants or network installations.

2.3.2 Monitoring investment in generation capacities in relation to SoS

Authorization criteria for new generation investments and long term planning

For all new projects (wind-, gas – and 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.

NVE delegates the responsibility for power system studies to an appointed licensee in a given network area. The main task is to contribute to a socio- economic rational development of the distribution and transmission network. 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 NVE'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 with a transmission capacity of 700 MW between Denmark (DK1) and Norway (NO2), Skagerak IV, was licensed in June 2010 and commissioned 29 December 2014. The Skagerak IV cable will increase the total capacity between Denmark and Norway to 1 700 MW.

License applications for two HVDC cables to Germany and UK, each with a capacity of 1400 MW was granted to Statnett in October 2014. The Nordlink-cable to Germany is being developed by the Norwegian TSO in cooperation with the German TSO (Tennet), and the German national bank (Kfw) is expected to be commissioned in 2020. Statnett and National Network in UK have signed a cooperation agreement with the aim of commissioning the DC cable between Norway and UK within 2022. Investment decisions for both projects has been made.

The 285 km, 420 kV OH line from Sogndal to Ørskog is under construction and was expected to be commissioned in 2015/2016, but due to a process in the Norwegian court system it will probably be delayed. 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 kV OH line for Balsfjord to Hammerfest was granted license in 2015, 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.

In addition to a new 420 kV OH line between Lyse and Støleheia, there are also several ongoing projects in South-Eastern Norway, which mainly consists of upgrading the existing main network to 420 kV. These projects will increase security of supply, allow more RES integration and is of importance in order to utilize the new HVDC cables to Germany and UK.

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

Statnett is planning to invest NOK 50-70 billion over the next decade. The historically high network investment level will ensure a reliable power supply, facilitate renewables projects and industrial and commercial development throughout Norway. Norway and Sweden have a mutual agreement of installing 26.4 TWh of new renewable energy within 2020, with financial aid through a green certificate market. This will together with the installation of AMS in all Norwegian households by 2019 and new HVDC cables to Germany and UK cause a high level of for investment in the distribution and transmission network in Norway in the coming years, as illustrated in Figure 12.

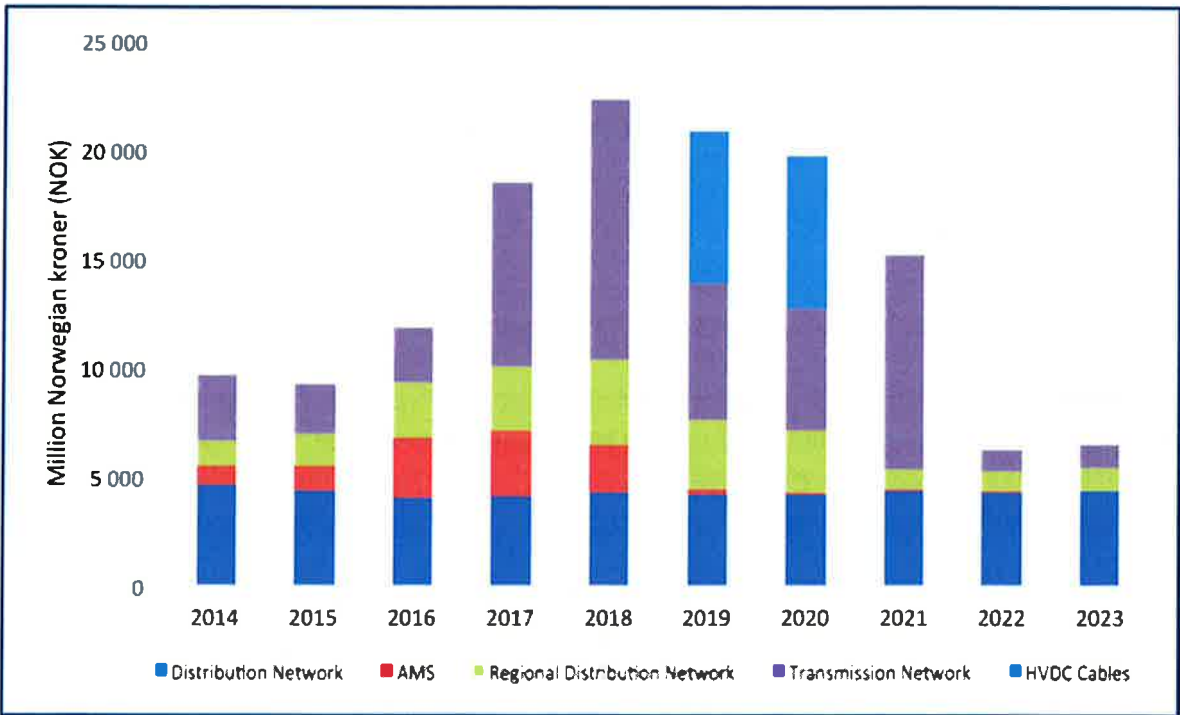


Figure 12. Expected investment levels in the Norwegian network.

In the period after 2023, it is expected that the network investment levels will normalize at around 5-10 billion NOK each year, but the need for further investments is possible. At the present there are 50 000 electric cars in Norway and a further increase in the number of electric cars might for example result in higher level of investments in the distribution network.

2.3.3 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 Norwegian regulation, 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 network can only be installed and operated based on decisions by the TSO.

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 Elspot price plus 5 øre/kWh excl. VAT (or 6.25 øre/kWh incl VAT). After six weeks, the network company is required to provide the customer with an incentive to choose a supply contract from an ordinary supplier.

3 THE GAS MARKET

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

Net domestic consumption of natural gas (excluding natural gas used as raw material) was 521 million Sm³ in 2014. This is a 1 percent increase from the year before. The increase was in Liquefied Natural Gas (LNG), while natural gas transported in pipelines decreased and consumption of Compressed Natural Gas (CNG) was unchanged.

Table 5. Net domestic consumption of natural gas in Norway (million Sm³)

2013			2014		
Natural gas transported in pipelines	CNG	LNG	Natural gas transported in pipelines	CNG	LNG
214	4	298	202	4	315

4 CONSUMER PROTECTION AND DISPUTE SETTLEMENT IN THE ELECTRICITY MARKET

4.1 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 show the price for 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 price before the price change takes 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 network 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 supplier 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.

4.2 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 TSO.

The Norwegian Electricity Appeal Board assists customers regarding complaints related to contracts for network connection, network 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 managed by a legal professional. In 2014, the Norwegian Electricity Appeal Board received 266 complaints and reached a decision in 82 cases.

Appendix

Table 6. Continuity of supply indices with reference to the end users as regards long interruptions in Norway

	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
2014	2.7	2.4	4.1	1.1	3.7

Table 7. Continuity of supply indices with reference to the end users as regards short 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
2014	2.0	2.4	3.5	0.8	4.2

Table 8. Energy supplied and some continuity indicators in Norway, as regards long interruptions

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
2014	114 527	4.3	12,4	16,6