NVE
The Norwegian Energy
Regulatory Authority -RME

RME RAPPORT
Nr. 8/2022

National Report 2021

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RME Rapport nr. 8/2022
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Published by:	The Norwegian Energy Regulatory Authority
Authors:	Tore Langset and Hege Holte Nielsen
Photo:	Velaug Amalie Mook/NVE-RME
ISBN (online):	978-82-410-2264-7
ISSN (online):	2535-8251
Saksnummer:	202116067

Summary: The Norwegian National Report 2021 describes the development of the electricity and gas markets in 2021. The report is based on the reporting requirements pursuant to the Electricity Directive 2009/72/EC article 37.

Keywords: Energy regulation

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October 2022

FOREWORD

The national report is prepared by the Norwegian Energy Regulatory Authority (NVE-RME) to the Ministry of Petroleum and Energy, the Agency for the Cooperation of Energy Regulators and the EFTA Surveillance Authority on the state of the Norwegian electricity and natural gas markets as required by Article 37 of Directive 2009/72/EC. The Report describes the main developments in the Norwegian electricity and gas markets during 2021, both in the wholesale and retail markets and presents an overview of the current arrangements for network regulation and the technical functioning of the electricity and gas sector including approved terms and methodologies.

2021 was an extraordinary year due to the high energy prices on electricity and gas, especially in the last quarter of the year. The electricity production in Norway reached an all-time high level at 157.1 TWh, where hydropower contributed with 91,5 percent of the total electricity production. The Nordic electricity system is highly dependent on the hydrological situation and 2021 was a dryer year than normal in Norway with low reservoir levels in the south and reservoir levels below historical minimum levels several subsequent weeks in the west. At the same time, the average available export capacity increased by 5 percentage points due to more available transmission capacity from the south of Norway to the continent, in combination with the start-up of North Sea Link to UK in October.

Norway is a member of the European Free Trade Association (EFTA) and is a part of the European Economic Area Agreement (EEA). Consequently, the EEA procedures regarding the adoption of new EU legislative acts is applicable to Norway. The Norwegian National Report 2021 is subject to common reporting structures developed by CEER. This report and the National Report of the EU member states will be available on the CEER website www.ceer.eu.

NVE-RME is a member of the Council of European Energy Regulators (CEER), the Agency for the Cooperation of Energy Regulators (ACER) and the organisation for the cooperation of Nordic Energy Regulators (NordREG). In 2021, NVE-RME has continued its efforts to contribute to the work of ACER, CEER and NordREG to obtain a well functional electricity market.

Oslo, 31.10. 2022

Tore Langset

Director
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CONTENT

1. THE NORWEGIAN ENERGY REGULATORY AUTHORITY

The Norwegian Energy Regulatory Authority (NVE-RME) is the national regulatory authority for the electricity and natural gas markets in Norway. Our main statutory objective is to promote socioeconomic development and environmentally sound energy system with efficient and reliable transmission, distribution, trade and use of energy.

NVE-RME regulates areas such as economic and technical reporting related network revenues, market access and network tariffs, non-discriminatory behaviour, market conduct and transparency, customer information, metering, settlement and billing as well as system and market operation. The Energy Act regulates the main frame of the Norwegian electricity and gas markets. NVE-RME has the power to enforce many of the provisions in the Energy Act. NVE-RME is a separate entity with its own budget set by the Parliament and has the authority to act within the scope of its competences.

NVE-RME 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-RME also cooperates with the Norwegian Consumer Council. NVE-RME is a member of the Council of European Energy Regulators (CEER), the Agency for the Cooperation of Energy Regulators (ACER) and the organisation for the cooperation of Nordic Energy Regulators (NordREG).

2. MAIN DEVELOPMENTS IN THE ELECTRICITY MARKET

2.1 All-time high production and historically low reservoir levels in the western part of Norway

The electricity production in Norway reached an all-time high level of 157.1 TWh in 2021, where hydropower contributed with 91,5 percent of the total electricity production. The Nordic electricity system is highly influenced by the hydrological situation and 2021 was a dryer year than normal in Norway with low reservoir levels in the south and reservoir levels below historical minimum levels several subsequent weeks in the west[1].

The average spot price in Norway was 60 EUR/MWh in 2021. This is the highest annual average spot price Norway has experienced. The price difference between the north and southern part of Norway was high, with average spot prices at 35 EUR/MWh and 75 EUR/MWh respectively. The middle part of Norway had average spot prices at 41 EUR/MWh.

At the same time, the average available export capacity increased by 5 percentage points to a total of 17.6 TWh due to more available transmission capacity from the south of Norway to the continent, in combination with the start-up of North Sea Link to UK in October.

The gross consumption in 2021 was 139.5 TWh.

2.2 Interconnector from Norway to Great Britain

The North Sea Link (NSL) to Great Britain with a transmission capacity of 1400 MW was ready for trial operation from 1 October 2021. The maximum capacity during trial operation for Q4 2022 was 700 MW. Due to Brexit, the NSL interconnector can`t participate in any of the market solutions included in the internal European energy market, like for example the Single Day Ahead Auction (SDAC). For the NSL interconnector there is a separate day ahead auction between NO2 and UK. The result from this auction is ready before the SDAC-auction closes. Due to this separate auction, there will be two-day ahead prices in NO2, one from the auction with UK and one from SDAC.

2.3 Changes in the existing regulation and public consultations in 2021

Updated security requirements for smart metering systems

NVE-RME proposed a set of updated security requirements for smart metering systems in a public consultation from April to August 2020. The proposed requirements are more detailed than previous requirements and aim to improve the protection of the meter data value chain. Well formulated security requirements are necessary to be able to use smart metering data in market processes and are becoming increasingly important. The updated requirements are applicable to smart metering systems at all voltage levels, for all production, consumption, and exchange between network areas. NVE-RME has proposed that the updated requirements should enter into force 1 January 2021 for smart metering

[1] Historical maximum and minimum are calculated based on the last 20 years.

systems connected to final customers in the low voltage network, and 1 July 2023 for the remaining smart meters.

Legal and functional unbundling in secondary legislation

According to secondary legislation, all DSOs were subject to legal unbundling from 1 January 2021. DSOs cannot own or be owned by another entity engaged in electricity production or trading. Network operations and production and/or trading activities needs to be carried out in separate companies. DSOs with more than 10 000 customers are also subject to functional unbundling. Employees with management responsibilities in a network company can't be involved in the management of other companies in the integrated company. The parent company may not be involved in day-to-day management and operations or in investment decisions. In addition, the participation of board directors, use of branding and marketing, sale of excess capacity and cooperation on joint operations centres are regulated in secondary legislation and entered into force 1 January 2021 and 1 January 2022, respectively.

Economic regulation of transmission networks

In 2021, NVE-RME implemented a new model to strengthen the TSO's incentives for cost efficiency. The new method ensured a stronger differentiation between actual costs and the cost norm. The strengthening introduced an efficiency analysis that compares the TSO's annual costs to its own historical cost levels. The relative development in costs will be measured against the relative development in a calculated output variable, which basically accounts for all the TSO's network assets. The efficiency result from this analysis will be used to calculate the cost norm. In addition, we have implemented a productivity requirement of 2% in the cost norm, which is meant to capture an expected increase in productivity, as well as proven inefficiencies in the historical cost data.

Capacity-based tariffs

In 2020, NVE-RME recommended changes in the tariff structure to facilitate better utilization of the network and fair distribution of network costs between customers. The introduction of capacity-based tariffs in the distribution network aims to reward smart use of electricity and reduce the need for network investments.

The recommended changes involved:

- a change from volumetric to more capacity-based tariffs and that income from the volumetric energy charge should not exceed 50 % of the income from each customer group
- that the tariff for customers with a consumption below 100 000 kWh/year should consist of only two charges:
    - a fixed charge – differentiated based on the customer demand for capacity
    - an energy charge that maximum covers 50 % of the income from the customer group

The energy charge may be time differentiated (ToU). In December 2021, it was decided that the proposed changes should enter into force 1 July 2022. However, an initiative from the industry and consumer organizations in the spring 2022 resulted in a transitional provision, allowing income from the energy component to cover more than 50 % until 1 July 2024.

Reservation of capacity for regular customers

The main principle for reservation of capacity is that the first customer to ask for capacity is prioritized before later inquiries. However, NVE-RME has specified that network companies may reserve capacity in the network for regular customers. The term "regular customers" includes household customers, holiday homes and smaller industry. The assessment of how much capacity that shall be reserved for regular customers should be made individually by each network company. The network company must ensure transparency regarding the process of reserving capacity.

The network companies are obliged to make a grid development plan that also takes into consideration the need for capacity. To ensure sufficient development plans, it is important to identify future needs and to start the necessary processes early to develop the network, so that connections can be provided within a reasonable time.

Temporarily scheme to help household consumers to cope with high energy prices

The Norwegian government has introduced a temporary support scheme due to the extraordinary high electricity prices. The financial aid scheme for households was activated from December 2021 to March 2023. The Norwegian Energy Regulatory Authority (NVE-RME) has been designated to administer the scheme.

All electricity consumers in Norway can freely choose supplier and type of contract, and the support scheme is independent from these. The households are given financial aid to cover a share of the consumption up to 5 000 kWh per month if the average monthly price in their bidding zone exceeds 70 øre/kWh. The support was set at 55 percent in December 2021, 80 percent from January to October 2022, 90 percent from October to December 2022, and 80 percent from January 2023 to March 2023. The scheme applies to households, not leisure homes or the industry. The household customers don`t have to apply for financial aid, the DSOs automatically transfer aid to all household customers in their grid area. The customers receive the financial aid through a deduction on their network tariff bill. There are 5 bidding zones in Norway and 92 DSOs.

Table 1 Financial aid and average electricity spot price in each of the bidding zones in Norway.

Bidding zone	Average electricity spot price	Financial aid
NO1 (Oslo)	177.13 øre/kWh	73.65 øre/kWh
NO2 (Kristiansand)	177.08 øre/kWh	73.62 øre/kWh
NO5 (Bergen)	176.69 øre/kWh	73.35 øre/kWh
NO3 (Trondheim)	60.77 øre/kWh	0 øre/kWh
NO4 (Tromsø)	60.68 øre/kWh	0 øre/kWh
NO4 (Tromsø)[2]	60.68 øre/kWh	0 øre/kWh

[2] Residents of Nordland, Troms and Finnmark are exempt from paying VAT on electricity. The support rate in these counties will therefore reflect this (the rebate will be lower).

Another measure introduced to cope with the high electricity prices is financial aid to agriculture. The support scheme for agriculture is designed in the same way as the support scheme for household customers. The Norwegian Agriculture Agency is responsible for the scheme.

Recommendations to improve the retail market

NVE-RME and the Consumer Authority established a working group in March 2021 to address challenges consumers face when paying for their electricity. The working group has identified several recommendations that aims to improve the information consumers receive and how to handle unfair business practice by suppliers. In June 2021, NVE-RME provided a list of eight recommendations that include proposals for legislative changes to increase information provided on the electricity invoice, improved price information and an official information platform. Other suggestions include a comparable unit price for add-ons, definition of standard terms, obligation to offer a certain type of contract, creating a common complaint platform and creating an information portal for consumers.

NVE-RME has been working on a legislative change to improve the mandatory billing information consumers receive. The changes have been on a public consultation with proposed changes in the consumer legislations put forward by the Consumer Authority and the Ministry of Children and Families. Furthermore, NVE-RME and the Consumer Authority have decided to improve the cooperation by improving information exchange and establish regular status meetings.

Sharing of surplus production from renewable energy sources

In 2021, NVE-RME has been working on a model to allow customers within the same property to share surplus production from renewable energy sources. The existing regulation is adapted to properties with one electricity meter. This might reduce the potential for the utilization of the solar panels in properties with more than one electricity meter, for instance apartment buildings. NVE-RMEs has recommended a solution where customers within the same property may share surplus production, up to a limit of 500 kW per property. The surplus production from a production facility will be shared between the customers within one property. The arrangement is handled financially, not physically through the network.

Official Norwegian Report on future network development

A public committee was appointed by the Ministry of Petroleum and Energy 11 July 2021 to assess the network development in Norway. The committee delivered a report 15 June 2022 on the three main tasks:

1) measures to reduce the period for developing and licencing new networks
2) principles for ensuring a socio-economic development of the network in a time of great uncertainty of the development of consumption, and
3) possible improvements of the system of network connection. RME is actively participating in the secretariat of the committee.

Non-firm connections

From April 2021 network companies can give customers a non-firm connection to the network. This non-firm connection enables the network companies to curtail consumption on terms that are agreed upon between the parties. The agreement is voluntary by both parties and must be accepted by all affected network companies. The amendment enables customers to connect faster and might postpone or avoid network investments.

Network Codes and Guidelines

In 2020, NVE-RME prepared the implementation of Guidelines on Capacity Allocation and Congestion Management (CACM), Guideline on Forward Capacity Allocation (FCA), System Operation (SO) and Guideline on Electricity Balancing (EB). These codes/guidelines were implemented in the Norwegian legislation 1 August 2021.

NVE-RME has also been working on the technical requirements of the connection codes on demand connection (DCC), network connection of generators (RfG) and on network connection of high voltage direct current systems and direct current-connected power park modules (HVDC). Statnett has reviewed the connection codes in cooperation with the stakeholders and has made preliminary proposals for national specifications.

Changes in the regulation relating to system responsibility in the power system

The Norwegian TSO can request immediate changes in the active power production of a power generating module in the Norwegian network according to the regulations on system responsibility § 12. Previously, this right was limited to those instances where it was a disturbance in the network, but this has been changed to cover all instances where it is a difficult system operation.

Illustration: Henning Weyergang-Nielsen

3. THE ELECTRICITY MARKET

3.1 Network regulation

3.1.1 Unbundling

There is only one publicly owned TSO in Norway, Statnett. The procedure for certifying Statnett as a TSO was ongoing in 2021 and finalised in 2022.

In Norway, all DSOs are required to be legally unbundled from 1 January 2021, regardless of the number of connected customers. In special circumstances, a DSO can apply for an exemption to the requirement. By the end of 2021, 77 DSOs were legally unbundled representing 99 percent of the total connected customers.

All legally unbundled DSOs have the obligation to provide an annual report on neutrality on their websites that gives information of the DSOs fulfilment of the requirement regarding neutral and non-discriminatory conduct.

DSOs with more than 10 000 connected customers are required to be functionally unbundled. These DSOs cover 93 percent of the total connected customers today. By the end of 2021, there were only 50 Norwegian DSOs with less than 10 000 connected customers.

New requirements regarding marketing and communication (branding) for DSOs entered into force on 1 January 2021 and must be applied at the latest by 1 January 2022. The DSOs are required to have a separate identity from all other companies in the group.

From 1 January 2021, all DSOs must have a separate customer database from other companies. Typically, integrated DSOs and retailers shared a customer database. Separate databases ensure that customer data does not flow from the DSO to affiliated market participants and will ensure that all retailers compete on an equal footing.

3.1.2 Technical functioning

Quality of electricity supply

NVE-RME has extensive legal powers on the regulation of the quality of electricity supply. The Norwegian regulation[3] on the quality of supply applies to those who wholly or partially own, operate or use electrical installations or electrical equipment connected to the Norwegian electricity system.

This involves establishing requirements for all parties connected to the Norwegian electricity system. This includes network companies, the performance of any activities subject to competition (production, energy trade and/or supply), Statnett, electricity producers and end-users regardless of if they hold a license according to the Energy Act or not.

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 since 2014, voltage unbalance and harmonic voltages including total harmonic distortion (THD). If considered necessary, NVE-RME has the power to set minimum requirements for other voltage disturbances, such as transient over-voltages, interharmonic voltages and main signalling voltages.

Statnett and the DSOs must continuously register dips, swells and rapid voltage changes in their own characteristic high and medium voltage network since 2006. In addition, they have been obliged to register total harmonic distortion (THD)[4] and flicker. Statnett and the DSOs were also obliged to report the above-mentioned voltage quality parameters (except rapid voltage changes) to NVE-RME since 2014. From 2019 the DSO and Statnett are also obliged to register and report data on supply voltage variations (r.m.s. voltage), measured as an average over 1 minute. The purpose of these required registrations is that Statnett and the DSOs have an obligation to provide information about the expected quality of their network from existing and possible new customers on request. I.e., the first reporting of voltage quality to NVE-RME was in February 2015. NVE-RME has established a database for all the reported data. From 1 July 2020, the responsibility for the national database for reported data on voltage quality was transferred from the NRA to the TSO.

In case of a customer complaint regarding power quality, Statnett and the DSOs will do the necessary investigation to verify compliance with the requirements in the regulation. If the complaint concerns voltage quality, and there is not an obvious cause, 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, Statnett and the DSOs must identify the reason for this and identify the responsible party for the violation. The responsible stakeholder must rectify the situation without undue delay. In cases where a

3 Norwegian Regulation 30 November 2004 No 1557 on the Quality of Supply in the Power System

4 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 beyond limits. If one or more individual harmonic voltages are beyond limits it can be challenging for users of the grid and may cause malfunction or damage to equipment connected to the grid.

customer (end-user, prosumer, producer or other DSOs) is identified as the responsible party, they are exempted from the requirement to rectify if, and only if, no other stakeholder is affected by the voltage violation. If Statnett or the DSOs have done the investigations mentioned above without reaching an agreement with the customer, the case can be brought forward to NVE-RME for decision.

Interruptions

NVE-RME 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.

Statnett 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. In the beginning, the data was reported with reference to specific reporting points in the network. A reporting point used to be a distribution transformer, or an end-user connected above 1 kV. Since 2014, a reporting point is defined as an end-user connected to any voltage level, above or below 1 kV. NVE-RME used “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 ENS (CENS, in Norwegian “KILE”), among others. Until 2009, this quality adjusting was based on calculating the amount of energy not supplied, and hence a standardised 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 be directly 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 statistics for the reliability of the power supply).

The interruption data also included end-users from 2005. The main reasons for introducing this was to make it easier to understand for non-technical customers and to compare with other countries.

The data is reported according to the following definitions:

- For long (> 3 min) and short (≤ 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 and Figure 2. Figure 1 represents long interruptions and Figure 2 represents short interruptions (Tables with corresponding figures are enclosed in the appendix).

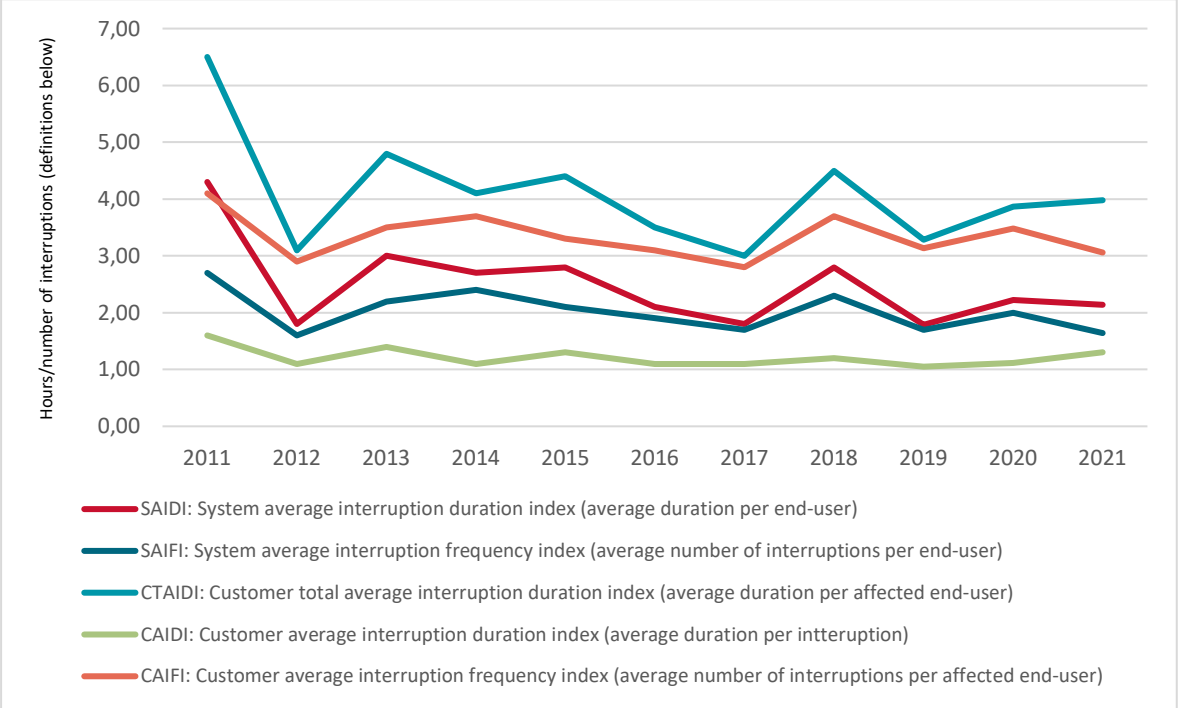


Figure 1 Continuity of supply indices with reference to end users - long interruptions (> 3min)

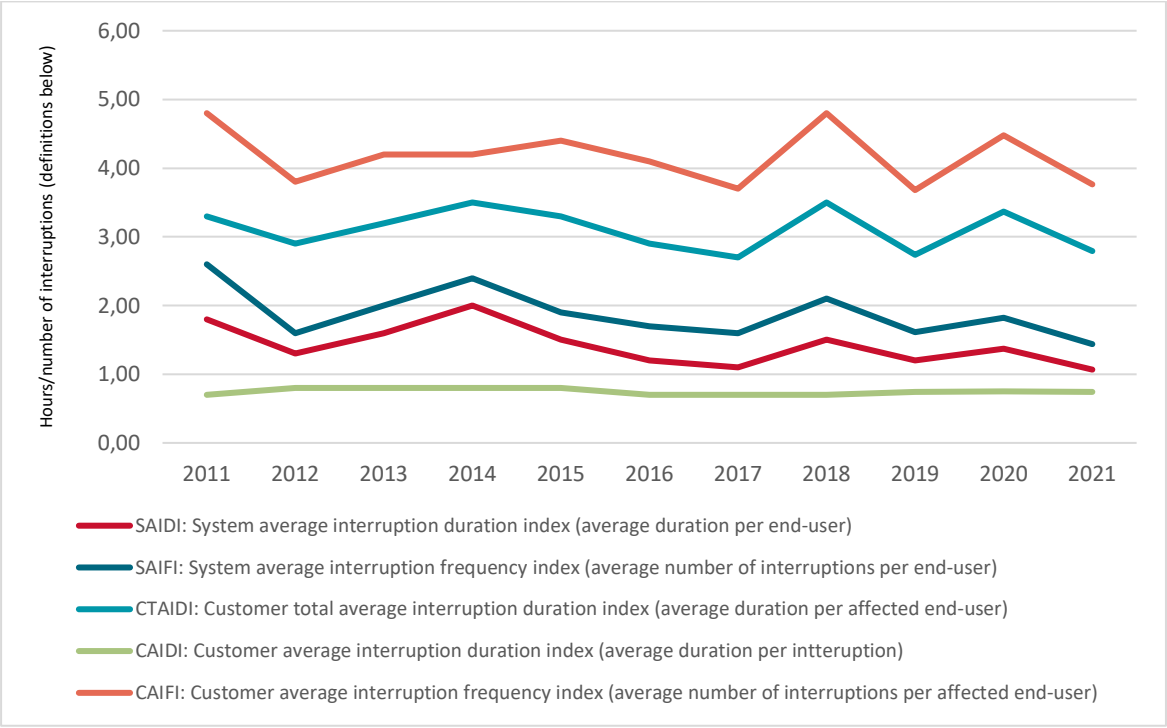


Figure 2 Continuity of supply indices with reference to end users - short interruptions (≤ 3min)

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 have been increased to 36.

Table 2. Energy supplied and 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	16.30	13.80	30.10
1997	101,987	15.40	20.20	35.60
1998	106,228	12.20	11.70	23.80
1999	106,525	11.40	17.30	28.80
2000	104,193	8.40	16.50	24.90
2001	108,361	4.80	12.30	17.10
2002	107,814	4.60	12.70	17.30
2003	105,572	4.80	15.60	20.40
2004	109,459	4.30	10.30	14.70
2005	111,804	5.60	9.30	14.90
2006	106,385	4.10	11.80	15.90
2007	109,712	4.70	10.10	14.80
2008	109,570	4.20	11.40	15.60
2009	107,052	3.60	8.90	12.60
2010	111,041	3.70	7.50	11.20
2011	107,045	4.00	33.20	37.20
2012	110,698	3.80	8.00	11.80
2013	112,118	3.80	24.90	28.70
2014	114,441	4.30	12.50	16.80
2015	116,062	4.50	16.50	21.00
2016	117,684	4.10	10.80	14.90
2017	116,608	4.50	9.10	14.30
2018	120,986	5.00	15.10	20.10
2019	126,247	5.32	8.69	14.01
2020	126,761	7.09	11.95	19.04
2021	126,389	5.08	11.42	16.51

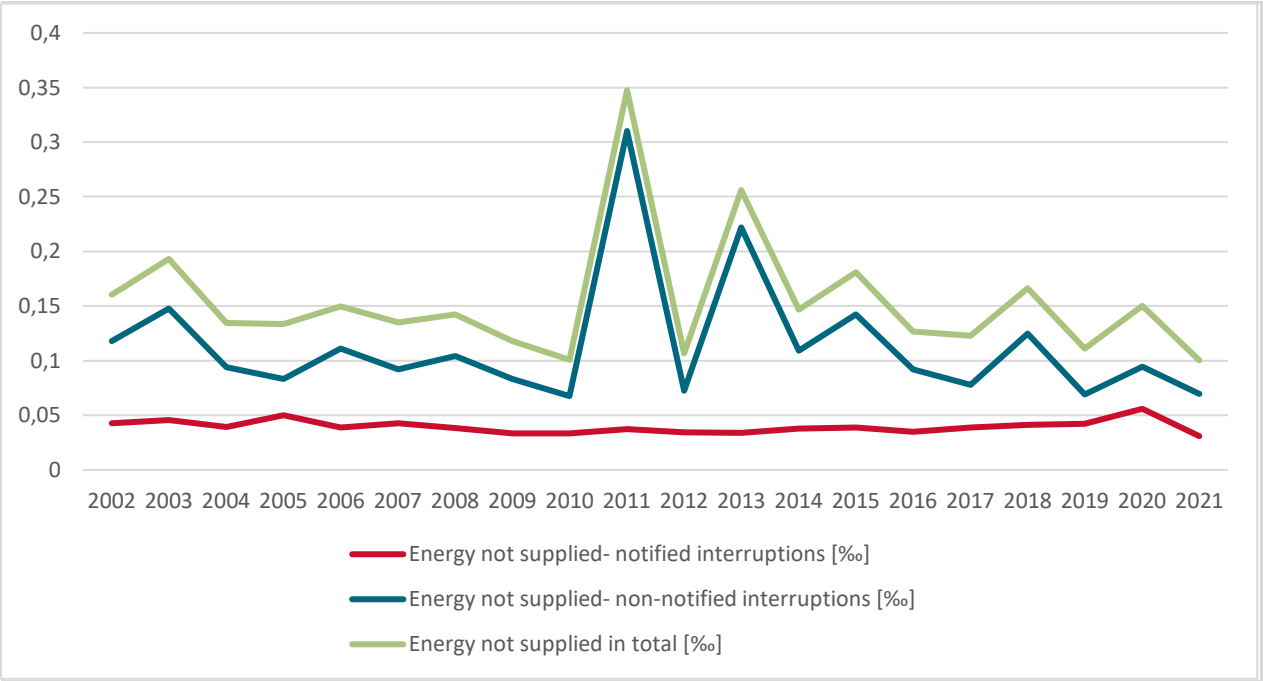


Figure 3 Energy not supplied (ENS) in thousand relative to the energy supplied (ES) to end users in Norway since 2002

In 2021 the average number of interruptions per end-user decreased compared to 2020, while the average interruption duration per end-user were almost unchanged. This means that the average duration per interruption increased in 2021 compared to 2020. In 2003, 2006, 2011 and 2013, several hurricanes caused a higher amount of energy not supplied. The amount of energy not supplied in 2014 was lower than in 2013, although storms in the northern part of Norway and thundershowers in the summer caused a higher number of interruptions per customer. In 2015, the number of interruptions per customer was lower than in 2014, but the average interruption duration increased. This may be due to fewer interruptions caused by thundershowers and more interruptions caused by wind during storms. Interruptions due to storms with heavy wind normally takes longer time to repair than interruptions due to thundershowers.

Balancing market and balance settlement

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.

Norway is a part of an integrated Nordic balancing energy market for manual frequency restoration reserves (mFRR), known as "the regulating power market". The Nordic area (except DK1) is a common synchronous area, and the Nordic TSOs therefore collectively operate the Nordic area as one single load frequency control area. In the regulating power market, generators and consumers can, subject to a minimum bid size requirement of 10 MW, submit bids to provide the TSOs with regulating power to balance the system. The bids with the lowest cost for upward or downward regulation are activated depending on the TSOs' needs, and the final price is set based on marginal pricing (pay-as-cleared). In this way, the balancing resources are utilized in the most efficient way.

According to Norwegian regulation, Statnett has the obligation to make sure that there are always sufficient available balancing reserves in the power system. The level is based on the dimensioning fault of the system, which is currently 1,200 MW in Norway. In addition, Statnett procures 500 MW mFRR to handle regional congestions and imbalances. To fulfil the requirement for available mFRR, Statnett operates a balancing capacity option market for mFRR (called "RKOM"), to make sure there is sufficient upward regulation on the merit order list. The RKOM is operational during wintertime, typically from October to April, and contracts are made both on weekly and seasonal level. Through RKOM, market participants are compensated for guaranteeing that they will provide upward regulation bids to the regulating power market.

In the forthcoming years, the Nordic TSOs (Statnett, the Danish TSO Energinet, the Swedish TSO Svenska Kraftnät and the Finnish TSO Fingrid) intend to further develop and make major changes to the existing integrated Nordic balancing market. This work is undertaken under the umbrella of the so-called "Nordic Balancing Model" (NBM) and has the main objective of introducing a 15-minute imbalance settlement period in Q2 2024 and improving the frequency quality in the Nordic area. In this context, the Nordic TSOs have also proposed to shift from the current concept of operating the Nordic area as one load frequency area to a so-called MACE-based model. This model implies that each Nordic bidding zone will function as load frequency areas and thus have an individual obligation to balance the Nordic system and to keep frequency rate oscillating within the accepted margins for deviation. The change from the current balancing approach entails a shift from a large degree of manual process to a large degree of automized process. The NBM also foresees other balancing-related measures such as the establishment of a balancing energy market for automatic frequency restoration reserves (aFRR) and capacity markets for aFRR as well as capacity markets for mFRR.

The NBM also ensures the Nordic area is compliant with various new requirements in the EBGL and its subordinated Terms, Conditions and Methodologies (TCMs). It also facilitates the Nordic countries' future participation in the European balancing platforms that are currently under development. At present, the Nordic TSOs intend to connect to the balancing platforms for aFRR ("PICASSO") and mFRR ("MARI") at the latest by medio 2024.

Statnett has also been given a license for the responsibility of the balance settlement. The licence obliges Statnett to ensure a financial balance in the balancing market, by acting as a clearinghouse 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, to harmonise rules and regulations. According to this model, the consumption balance was settled according to a single price, which was based on the marginal price of the activated mFRR balancing energy. The production balance was, however, settled according to two different prices, the Day-ahead clearing price or the marginal price of the activated mFRR balancing energy, depending on whether the imbalance contributes to reducing or increasing the net system imbalance, respectively. However, the Nordic TSOs moved to a single imbalance price model in Q4 2021, where each balance responsible party is settled at one single price for the sum imbalances of its consumption and production in accordance with requirements stemming from EBGL.

In recent years, NVE-RME has in cooperation with the Swedish (EI) and Finnish (EV) NRAs, worked with the TSOs to prepare for a common Nordic Balance Settlement (NBS) through a joint company ("eSett"). The NBS, which is an important step towards harmonised Nordic end-user markets, was successfully implemented in May 2017. The Danish TSO, Energinet, joined the NBS in 2018 and the settlement operations was handled over from Energinet to eSett in Q1 2021.

3.1.3 Network tariffs for connection and access

The Norwegian electricity network is characterised as transmission (400kV-132 kV) and distribution (132kV – 230V) network. Distribution network is further differentiated as regional distribution (132kV – 22kV) and local distribution (22kV – 230V) for regulatory purposes. Statnett is the only Transmission System Operator (TSO) and is responsible for the transmission tariffs. Statnett is the main owner of the transmission network. For minor parts that have previously been owned by distribution system operators (DSOs), Statnett is in the process of taking over. By the end of 2021, there were 94 network companies owning and operating regional distribution and/or local distribution network. Tariffs shall be structured in accordance with regulation 1999-03-11 no. 30; Regulations governing financial and technical reporting, income caps for network operations and tariffs.

Revenue Cap model

NVE-RME regulates the DSOs and Statnett using an incentive-based revenue cap (RC) model. The RCs are set annually, based on a yardstick formula of 40 percent cost recovery and 60 percent cost norm resulting from benchmarking exercises. The regulation model covers operators of all electricity networks. The DSOs are benchmarked in a model based on Data Envelopment Analysis (DEA): one model comparing companies operating the regional distribution networks and one model comparing companies operating the local distribution networks. The DEA-results are adjusted using regression analysis to account for different geographical challenges between the DSOs. The models also take differences in network structure and operating environments into account. The TSO, Statnett, is benchmarked against other European TSOs. However, this result is not used directly in the revenue cap regulation, the cost norm is calculated by benchmarking Statnett against their historical data

NVE-RME notifies the RCs for the coming year "t" in November (t-1), and the DSOs and TSO set their tariffs accordingly. In February, the year after the revenue cap year (t+1), we calculate the final RCs. We publish all data, benchmarking results and revenue cap calculations on our web page once the calculations are finished. This is to increase the transparency of the methodology and data used in the calculation of the RC. In principle, the notified and the final RCs for one year will only differ due to differences between estimated and actual electricity prices, inflation and WACC. In addition, we correct any errors in the DSOs' costs or technical data that we may discover prior to calculating the final RCs.

NVE-RME calculates the RCs based on expected total costs using inflation adjusted cost data from two years prior. The deviation between the expected total costs and the actual total costs for all companies in one year is included in the RC calculation two years later (e.g., we correct for the deviation between expected and actual costs for 2020 in the RC for 2022). We distribute the total cost deviation among the companies using their share of the sector's total regulatory asset base. This mechanism does not apply to the regulation of Statnett.

Allowed Revenue

The companies set their tariffs based on their allowed revenue, which includes the revenue cap, costs related to property taxes, approved R&D costs and tariffs paid to other regulated networks. To remove the time lag in the cost of capital recovery, we add the difference between actual cost of capital (depreciations and return on assets) in the RC year and the capital costs from two years back to the allowed revenues.

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 to minimize power outages.

The revenue compliance is subject to regulatory control. We calculate excess or deficit revenue for a given year as the difference between actual collected revenues and allowed revenues for that year. Actual collected revenues include tariff revenues from customers, congestion revenues and revenues from system operations. Since we consider revenues generated from congestions as part of Statnett's actual revenue, they contribute to reducing the base for tariffs that Statnett can collect from Norwegian customers. However, the costs related to reducing the congestion are also part of the tariff base, which implies that the congestion revenues are used to finance investments to eliminate congestion. We decide an excess/deficit revenue balance every year, approximately one year after the RCs are set. At that time, the companies have reported their actual costs for the RC-year. The DSOs should adjust this balance towards zero over time, through tariff changes. Excess revenues must be reimbursed to the customers, while deficit revenues may be recovered.

Tariff determination

The tariff requirements and calculation methodology are subject to NVE-RME regulation. All network companies are responsible for determining tariffs within their income cap according to the regulation of the tariff structure. The regulation set several requirements for the structure of tariffs. This includes:

- Network companies shall offer non-discriminatory and objective tariffs and conditions
- Tariffs shall give price signals about effective utilisation and development of the network
- Any differentiation of the tariff must be based on network related criteria that are objective and verifiable.
- All houses, apartments and vacation homes are to be metered and settled individually

All tariffs are based on costs referring to the consumer's connection point. An agreement with the network company at the point of connection provides access to the entire network system and the power market.

According to the regulation on tariff structure, tariffs consist of a consumption-based energy component based on marginal network losses, and a fixed annual amount per customer. The fixed component covers customer-specific costs and network costs that are not covered by the consumption-based tariff components.

Transmission network tariffs

The transmission network tariff consists of a variable energy component and a fixed component, set by Statnett.

The energy component reflects the load each customer puts on to the network system when drawing power from it or feeding power into it. System load is reflected through marginal loss rates calculated for each connection point in the transmission network. The marginal loss rate is symmetric around zero for feeding and drawing power at each individual connection point. In areas with a production surplus,

feeding (production) has a positive loss rate and drawing (consumption) a negative loss rate, and vice versa. The marginal loss rates in the transmission network are administratively restricted to ±15 per cent. Separate marginal loss rates are calculated for daytime, night-time and weekends, and recalculated weekly in order to reflect changes in system load. The marginal loss rates are published on Statnett's website and distributed to the customers on Fridays before the start of a new week. Area prices available on Nord Pool are used to calculate the energy component.

For the fixed tariff components, there is a distinction between feeding into (production) and drawing (consumption) of power. Cost allocation and differentiation between customer groups must take place in accordance with network-based, objective and non-discriminatory criteria.

Distribution tariffs

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 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.

The network companies calculate separate tariffs for high-voltage and low-voltage connections.

Table 3. Average tariffs for a household customer

	2020[5]		2021[6]	
	incl. VAT and consumer tax	excl. VAT and consumer tax	incl. VAT and consumer tax	excl. VAT and consumer tax
Energy component	0.42 NOK/kWh (0.039 €/kWh)	0.19 NOK/kWh (0.018 €/kWh)	0.42 NOK/kWh (0.041 €/kWh)	0.18 NOK/kWh (0.018 €/kWh)
Fixed component	2,437 NOK/year (227.4 €/year)	2,019 NOK/year (188.4 €/year)	2,608 NOK/year (256.4 €/year)	2,166 NOK/year (212.9 €/year)

Tariffs for production

Tariffs for production are independent of the recipient of the power. As for other tariffs, the tariffs for production consist of an energy component and a fixed component.

The energy component varies with the customer's current feeding (production) and is determined based on marginal network losses in the whole network system.

The fixed component for producers connected to the transmission level, set by Statnett, is normative for the fixed component for producers connected to the regional and distribution networks. The fixed component for 2021 was 0.0135 NOK/kWh, which included a G-charge of 0.0120 NOK/kWh and 0.0015 NOK/kWh for costs related to mark-up for system operation. Average annual production the last ten

[5] NOK 1 = EUR 0.0933
[6] NOK 1 = EUR 0.0983

years is used to calculate the tariff for each production unit. Tariffs for 2021 were based on data for the period 2010-2019.

Tariffs for prosumers

All consumers have a right to produce their own electricity and to sell surplus electricity. The network companies have a general obligation to connect prosumers and receive their production. Prosumers feeding in less than 100 kW are not charged the fixed component for production.
Prosumers choose their own electricity supplier that supply their need for electricity and buy surplus electricity from the prosumer. In December 2021 there were 9,128 prosumers in Norway.

Connection charges

Network companies calculate a connection charge to cover the cost of connecting new customers to the network or to cover the cost of reinforcing the network for existing customers. Until 2019 connection charges did not include investments in the meshed network. From 2019 connection charges for customers with capacity exceeding 1 MW, include a share of costs of network investments at all voltage levels, including investments in the regional distribution and transmission. Investment costs in regional and transmission network are in general multiplied by a reduction factor of 0.5 when taken into the connection charge. 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.

NVE-RME has handled and settled 4 complaints and disputes regarding tariffs and connection charges in 2021.

3.1.4 Cross-border issues

Capacity allocation and congestion management

CACM was implemented in the Norwegian legislation 1 August 2021. The TSO is responsible for establishing bidding zones to handle structural congestions, i.e., large and long-lasting congestions in the transmission network.

In 2022, there are five bidding zones in Norway. The bidding zones are NO1 (Eastern Norway including Oslo), NO2 (Southern Norway), NO3 (Middle Norway including Trondheim and Molde), NO4 (Northern Norway), and NO5 (Western Norway including Bergen).

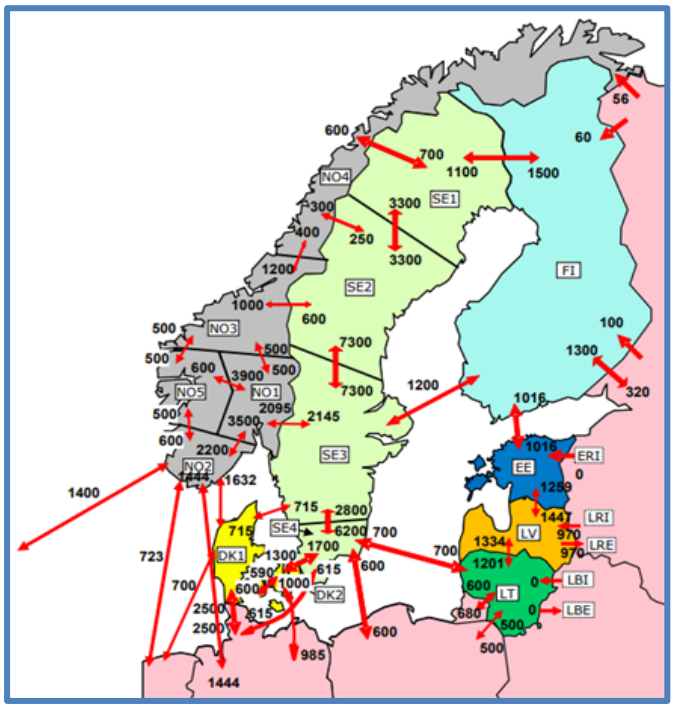


Figure 4. Bidding zones in the Nordic countries in 2022. Source: Nord Pool

The TSOs are responsible for determining the maximum permitted limits for transmission capacity (trading limits) between the Nordic bidding zones according to the Available Transmission Capacity (ATC/NTC) method. The relevant TSOs coordinate on the "binding" available net transmission capacity across national borders.

Further, the TSOs are responsible for publishing capacities for each border for the next day, two hours before gate closure of the Day Ahead market. Hence, these trading capacities are published 10:00 AM on the web site of Nord Pool (NP).

Norway takes part in the common European single day-ahead and intraday coupling. RME designated Nord Pool European Market Coupling Operator AS as a NEMO in November 2021 to perform the single day- ahead and/or intraday coupling. EPEX SPOT SE are offering services with delivery in Norway using the passport option from January 2021

Because of Brexit, the transmission capacity on North Sea Link (NSL) between Norway and Great Britain is not part of the European Market Coupling. Nord Pool European Market Coupling Operator AS is assigned marketplace concession to operate the trading solution on NSL. The trade on NSL is organised as a separate day ahead auction in bidding zone NO2 with market coupling to Great Britain prior to the European day ahead auction.

Norway has cross-border interconnections with Sweden, Denmark, the Netherlands, Germany, Great Britain, Russia and Finland. However, the interconnector towards Finland is small (150 MW), and

primarily it serves the purpose of providing overall system stability in this northern part of the Nordic network. Its available capacity for cross-border trading to the Day Ahead market is included in the NTCs on the SE1-FI border. The interconnection to Russia is a connection to the hydro power plant *Boris-Gleb* and only used for import.

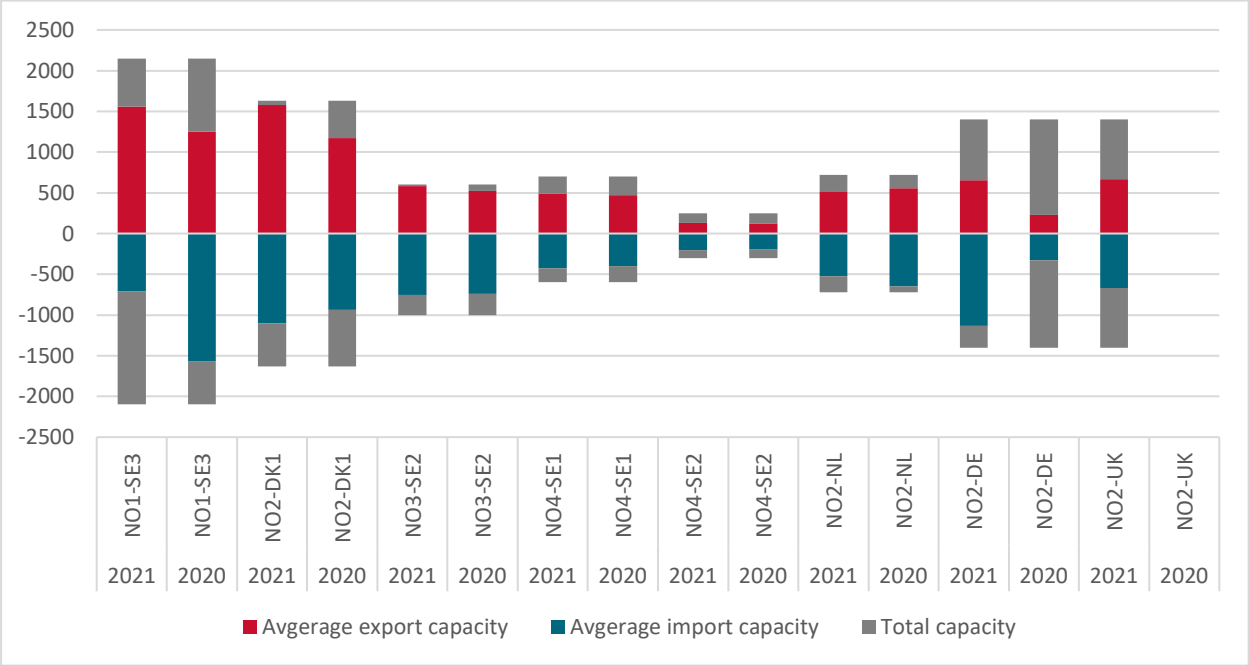


Figure 5. Available capacity in 2021 and 2020 for export and import as a portion of installed capacity for each cross-border interconnector. Source: Nord Pool Spot and SKM Syspower

The import capacity available to the market on Norway's largest interconnection between eastern Norway (NO1) and central Sweden (SE3) decreased significantly at 41 percentage points from 2020 to 2021. The reason for the reduction was mainly difficulties with the east-west power flow through SE3. The complication with the power flow also gave reduced capacity from Finland to SE3, as well as north-south in Sweden.

The border to Denmark consists of four parallel cables, Skagerrak (SK) 1-4, where SK4 has the highest capacity at 700 MW. The total capacity on all cables being about 1700 MW. There were limitations and faults on the SK4 onshore cable in Denmark throughout the year. To facilitate system as well as asset security, the operational pattern on SK4 is changed. It entails an asymmetrical capacity allocation, which means that more capacity is given in one direction than the other. It is possible to reverse the primary and secondary directions, but it takes a few days to complete this switching in the installations. The direction is set based on socio- economic criteria, and from March a large share of the capacity was given in the NO to DK direction. Additionally, it was cable faults on SK1 (26 June to 21 September) and SK2 (31 May to 1 October) which caused capacity reductions.

The interconnector between Norway and Germany, NordLink, started its trial operation in December 2020 and has been in ordinary operation from April 2021. The new interconnector increased Norway's cross border capacity with 1400 MW, but the available export capacity was significantly lower than installed capacity during 2021. On average the available export capacity was 47 percent and import capacity 81 percent. The reason for the low availability is mainly caused by transmission capacity limitations in Germany.

In October 2021 the interconnector between Norway and Great Britain, North Sea Link (NSL), started its trial operation. Initially the link operated at a maximum of 700 MW, and the capacity can be increased until the full 1400 MW can be achieved.

In 2021, Norway was a net exporter of electricity, with a net export volume at 17,6 TWh. On average 64 percent of the available export capacity was used, while the utilization rate of available import capacity was only 13 percent.

Table 4. Average availability of interconnectors in 2021 and 2020. Source: SKM Syspower

	2021		2020	
Connection	Export	Import	Export	Import
NO1-SE3	73 %	34 %	58 %	75 %
NO2-DK1	97 %	68 %	72 %	57 %
NO3-SE2	97 %	75 %	88 %	74 %
NO4-SE1	70 %	42 %	67 %	67 %
NO4-SE2	51 %	68 %	50 %	67 %
NO2-NL	71 %	72 %	77 %	90 %
NO2-DE	45 %	79 %	16 %	24 %
NO2-UK	50 %	50 %	0 %	0 %

Price differences

The division of bidding zones reflects physical structural congestions (transmission constraints) in the network. The relevant TSOs set cross-zonal transmission constraints daily for the next day, between all zones, in both directions. Capacity given to the Day Ahead market is physically firm, i.e., guaranteed and upheld by the TSO. A consequence of having multiple bidding zones is that different zones can have different wholesale prices, reflecting the underlying supply and demand given the network constraints. A system without bidding zones, on the other hand, would have required the TSOs to use more resources on redispatch measures. In turn, this would have resulted in increased costs for system operation and, all else equal, increased network tariff. Lack of bidding zones is also likely to have affected the TSOs possibility to operate the network within acceptable security limits.

An efficient wholesale market with bidding zones reflecting network topology will yield efficient price signals for both generators and consumers alike. The wholesale price is an important input both in the short run, e.g., planning of next days' generation or consumption, and in the long run e.g., for seasonal planning of maintenance as well as for investment purposes e.g., where to build power plants and where to place large consumption units.

The wholesale market price is also important for the TSO when considering network reinforcement or investing in new infrastructure. The price differences indicate the marginal benefit of expanding capacity between these zones. Consistently large price differences indicate a large potential welfare gain if the cross-zonal capacity is increased.

3.1.5 Compliance

DSOs

NVE-RME monitors network companies and ensures compliance with the neutrality criteria and other relevant regulations according to the Energy Act. NVE-RME has the authority to use sanctions such as for example fines in cases of non-compliance. All DSOs that are part of an integrated company are subject to legal unbundling, and DSOs with more than 10 000 connected customers are subject to functional unbundling. All legally unbundled DSOs are obliged to produce an annual report on neutrality on their websites. The report must be publicly available on the websites for five years.

Economic regulation

According to the economic regulation of network companies, transactions within an integrated company need to be based on competitive market conditions. If a DSO buys goods or services from another group company this must be exposed for competition in the market to ensure the correct market price. We audit a selection of the companies to reveal any possible breaches of these regulations annually.

3.2 Promoting Competition

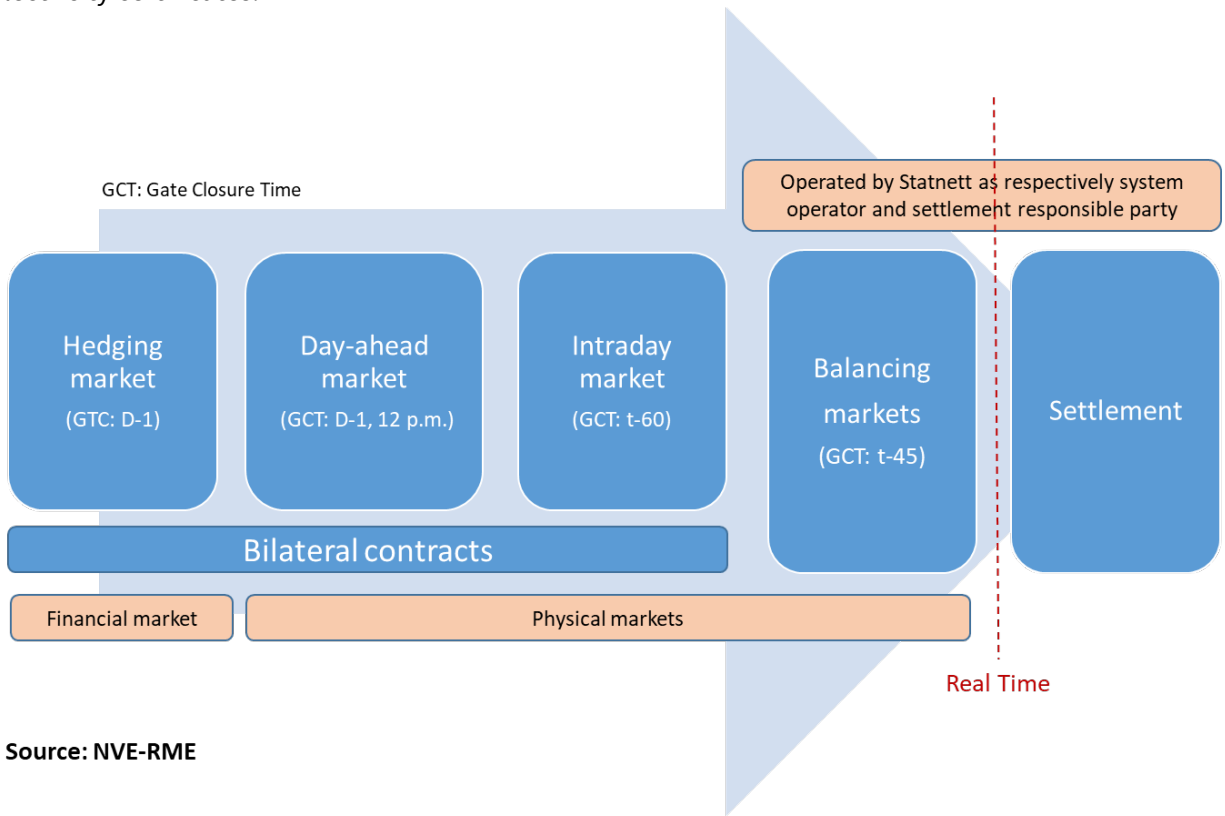
3.2.1 Wholesale markets

The Norwegian wholesale electricity market has been an integrated part of the Nordic market since the mid-1990s, and from 2014, a part of the European market coupling. Norway is now part of the single day-ahead and intraday coupling established by the Commission Regulation on capacity allocation and congestion management. Currently Nord Pool European Market Coupling Operator AS and EPEX SPOT SE offer services in the Day ahead and Intraday markets in Norway.

A high number of market participants and high market shares indicate good liquidity and a well-functioning market, which in turn contributes to the participants' confidence in the price formation.

Nord Pool is responsible for the System price calculation. The System price is the underlying price reference for 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. In addition, EPADs can be used to hedge against differences between area prices.

The main organised market for price hedging is the financial market organised by Nasdaq OMX (NOMX) and the Financial Supervisory Authority regulates the marketplace. The Exchange listed derivatives refer 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.



Source: NVE-RME

Figure 6. Time frame in energy markets

3.2.1.1 Price monitoring

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

Figure 7 shows how the weekly temperatures for Norway and Sweden developed through 2021 and 2020 compared to normal. The first and last quarters of 2021 were significantly colder than the equivalent quarters in 2020. This resulted in relatively high electricity consumption for heating purposes during the winter months. In total, the electricity consumption was 139,5 TWh in 2021, which is 5,8 TWh higher than in 2020.

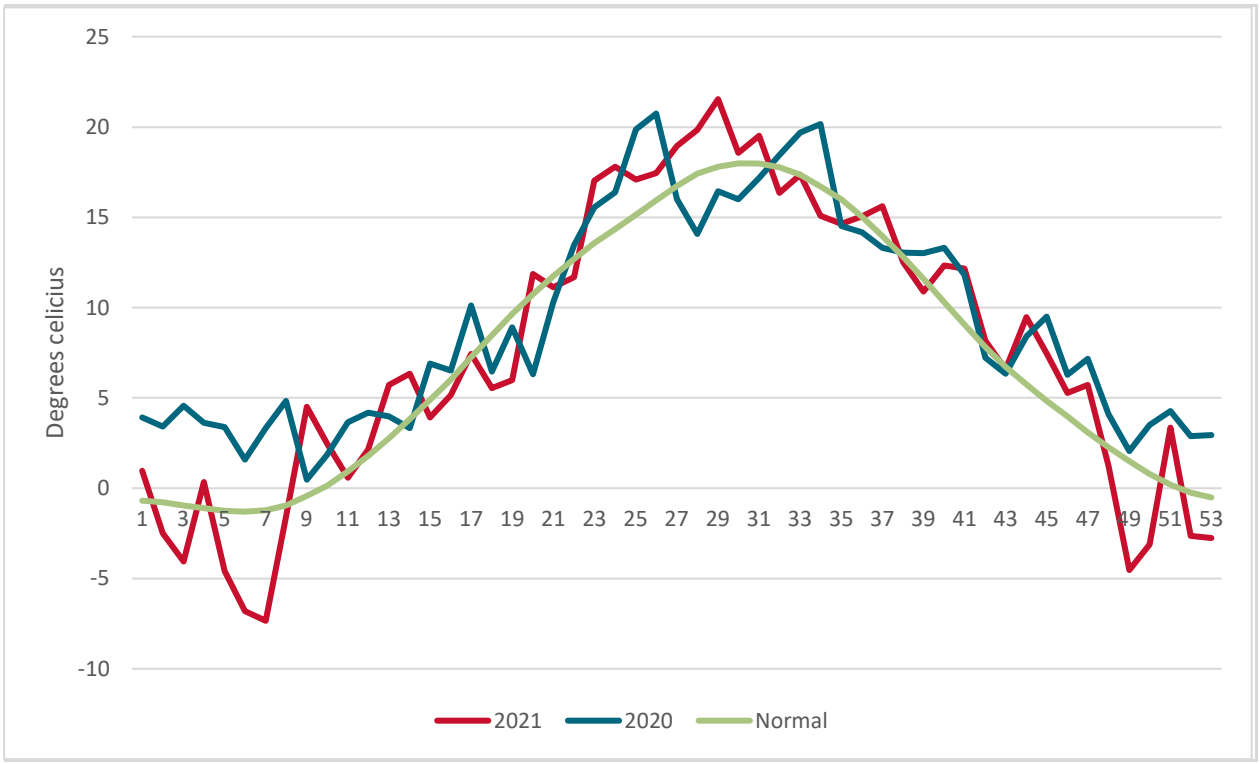


Figure 7. Average weekly temperatures for Norway and Sweden in 2021 and 2020 compared to normal. Source: SKM Syspower

Figure 8 shows the development of the Norwegian hydro reservoir levels in 2021 and 2020. In the beginning of 2021, the hydro reservoir levels were close to historical high levels. 2021 was a dryer year than normal. Compared with the last 20 years it was one of the four years with lowest inflow. This resulted in lower reservoir levels than normal in the southern parts of the country, especially during the fall. West Norway had several subsequent weeks with reservoir filling below historical minimum levels[7]. In the north of Norway (NO4) the reservoir filling was higher than normal during most of the year.

[7] Historical maximum and minimum are calculated from the last 20 years.

The Norwegian electricity production was 157,1 TWh in 2021, which represents an increase of 2,9 TWh from 2020.

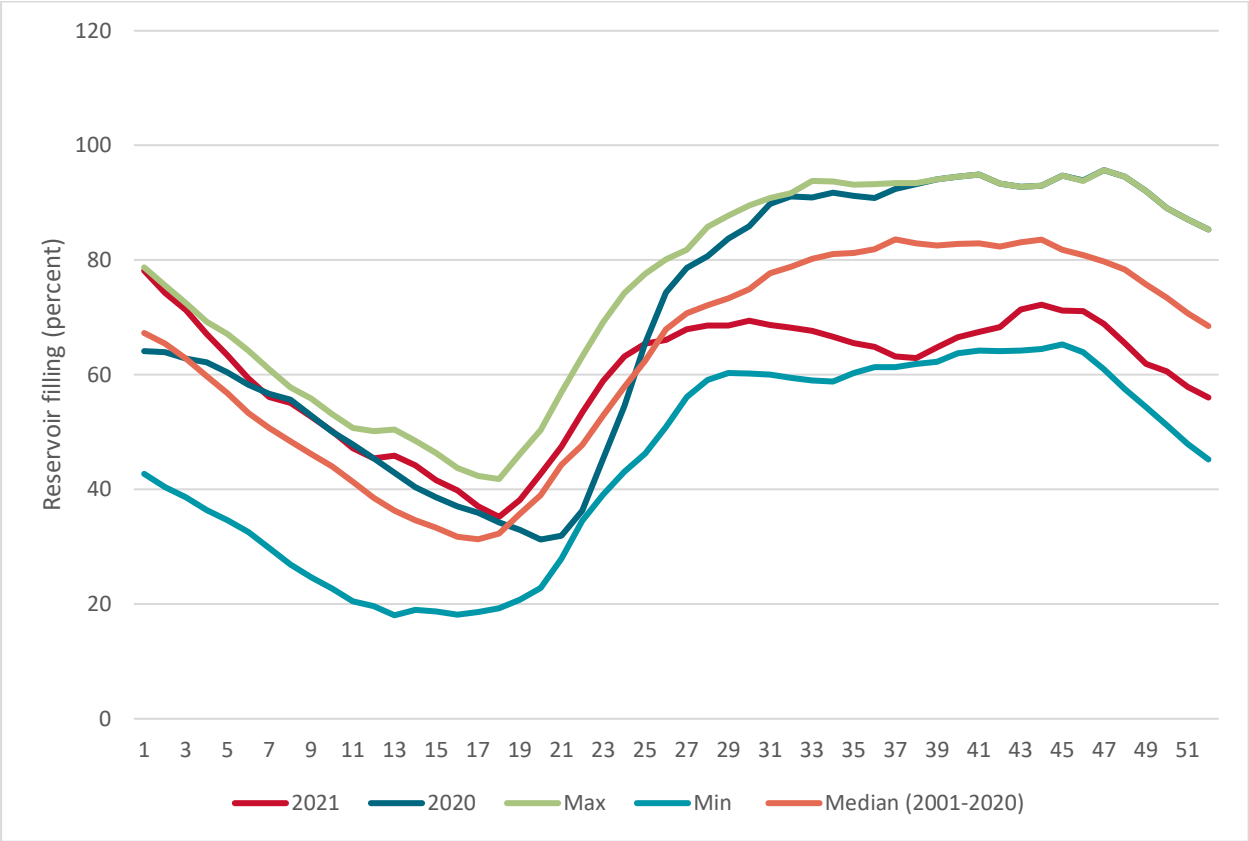


Figure 8. Hydro reservoir levels in Norway. 100 percent represents 87.2 TWh storage capacity. Source: NVE

Table 4 shows the annual average area prices in 2021 and 2020. The annual System price in 2021 was 62.3 EUR/MWh which represents an increase of 407 percent from 2020. The average electricity price in Norway was 60 EUR/MWh in 2021. This is the highest average electricity price Norway have experienced over a year. The price difference between north and south was high, and the average price in the south was 75 EUR/MWh, while it was 41 EUR/MWh in Mid Norway and 35 EUR/MWh in the north of Norway.

EUR/MWh	2021	2020	% Change 2020-2021
System Price	62.3	10.9	470 %
East Norway (NO1)	74.7	9.3	704 %
South West Norway (NO2)	75.1	9.3	708 %
Mid Norway (NO3)	41.1	9.5	334 %
North Norway (NO4)	35.0	8.9	295 %
West Norway (NO5)	74.6	9.2	713 %

Table 5. Annual prices in the Norwegian Elspot areas, €/MWh. Source: SKM Syspower

Figure 9 shows the price in the five Norwegian bidding zones in 2021. The price in the southern parts of Norway was in general higher than in the middle and northern part of Norway a large part of the year, but the price difference significantly increased the last half of the year. The record high gas and electricity prices on the continent, more export capacity with the start-up of NSL, and relatively low reservoir filling contributed to the high prices in the south of Norway the last part of the year. The southern part of Norway experienced record high electricity prices most of the last quarter of 2021. The average daily power price was close to 400 EUR/MWh in the south on 21 December, with hourly prices above 600 EUR/MWh.

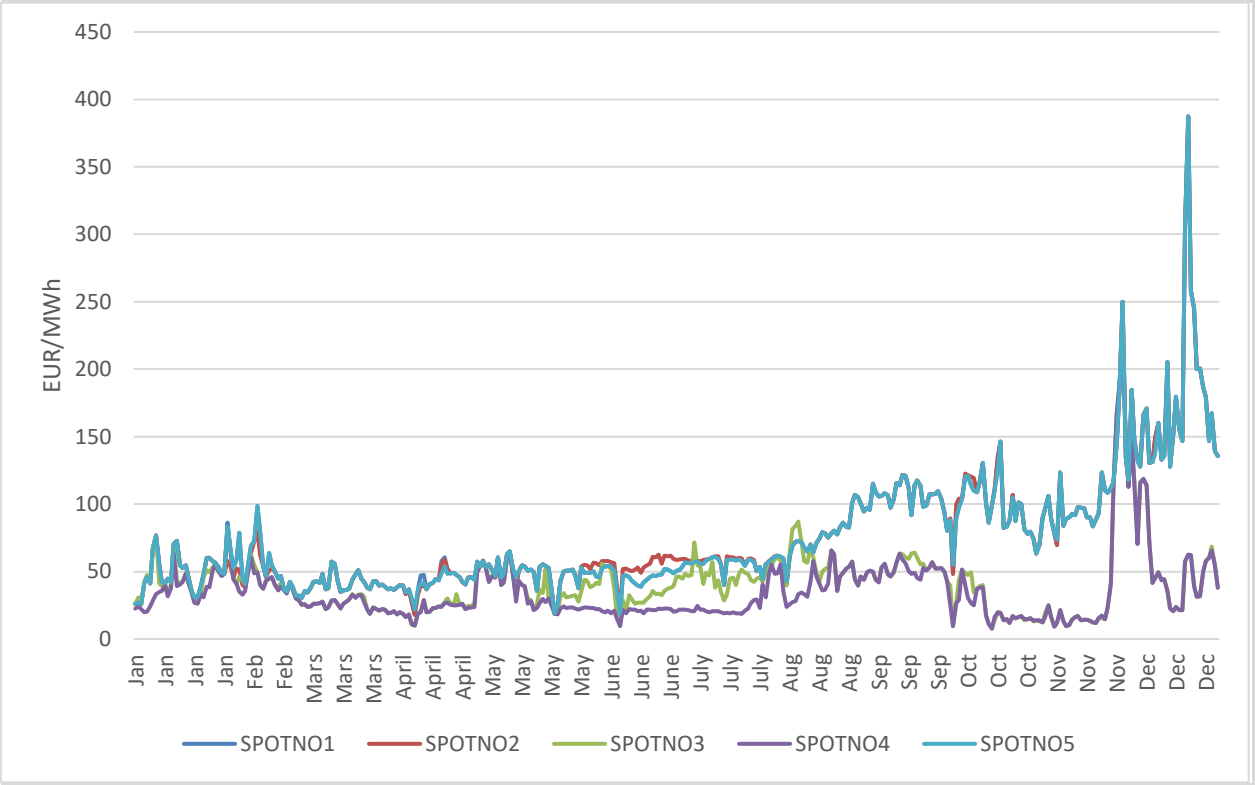


Figure 9. Price development in Norwegian bidding zones in 2021. Source: SKM Sypower

Figure 10 below shows the development in the daily Nordic System price in 2021 and 2019. As illustrated in the figure, the average System price was significantly higher in 2021 than 2020 during the whole year. The price was very volatile, especially during the last quarter. At the highest the daily price reached 300 EUR/MWh.

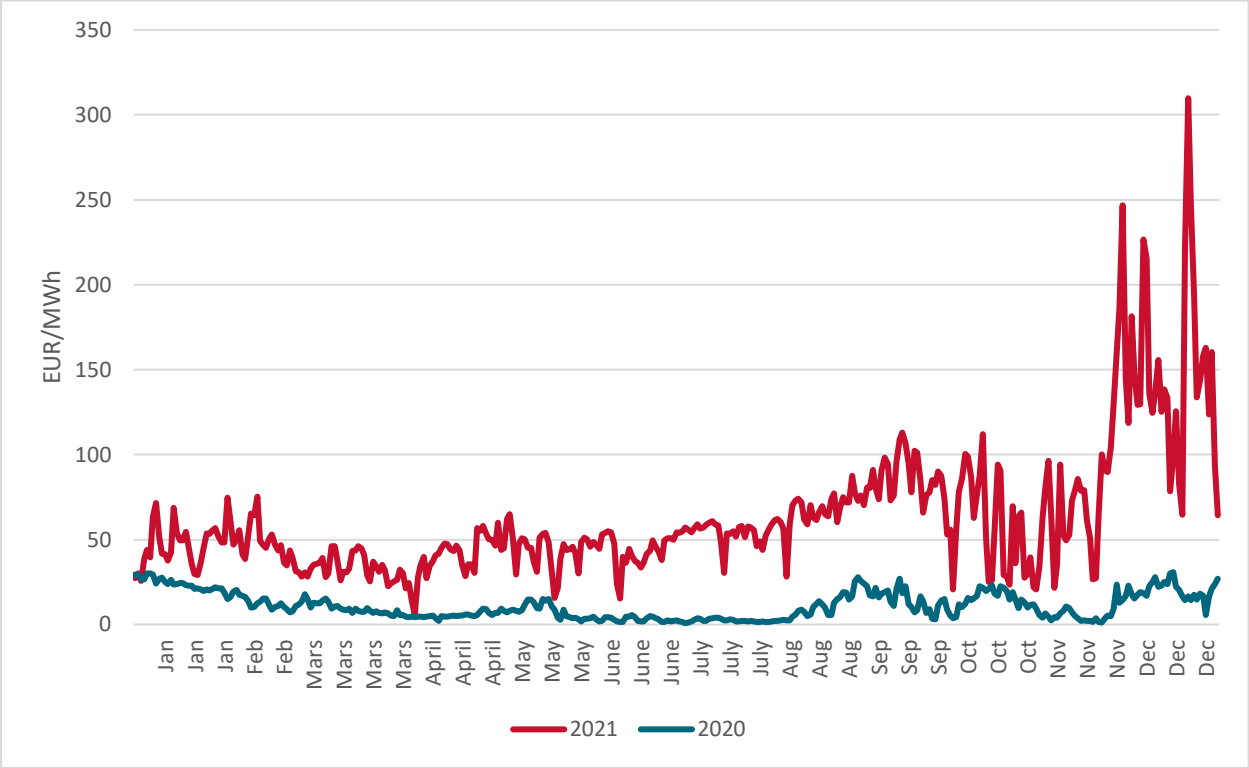


Figure 10. *Nordic System price 2021 and 2020, EUR/ MWh*

Regarding the price monitoring of the wholesale market, NVE-RME supports the Norwegian Competition Authority in monitoring the Norwegian generators bidding behaviour at NP. Price differences that can't be explained as price-taker behaviour is investigated by looking at the different participants bidding in the marketplace. As a part of this process, NVE-RME has the mandate to collect information regarding the bids from NP and production plans from the TSO.

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

Rules governing market conduct

Prohibitions of market manipulation and insider trading and requirements on disclosure of inside information is implemented in the Norwegian energy legislation. These provisions are similar to REMIT[8], and as a result Norwegian market conduct rules are harmonised with our neighbouring energy markets. The rules are enforced by NVE-RME. We are continuously strengthening our market surveillance and investigation capabilities to ensure that the market participants comply with the rules.

Further, also according to Norwegian energy legislation, the Norwegian TSO (Statnett) may suspend orders/bids in balancing markets when it is obvious that the price setting is not efficient.

According to the Norwegian energy legislation, the Norwegian TSO and power exchanges operating in Norway is required to establish and maintain effective arrangements and procedures to identify breaches of the prohibitions of insider trading and market manipulation. The TSO or power exchange who reasonably suspects a breach of the prohibition against market manipulation or insider trading shall notify NVE-RME without further delay. The requirement is similar to REMIT art. 15.

Furthermore, regulation given in the Norwegian Competition Act regarding abuse of dominant position and prohibition of collusive agreements may apply. These regulations are under the competence of the Norwegian Competition Authority. NVE-RME present assessments of the market situation for physical electricity to the Competition Authority.

Transparency in the wholesale market

According to the Norwegian energy legislation, market participants are required to publish inside information on a publicly available platform. Further, Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets applies.

In addition, NP publishes a range of market data per market time unit (per hour):

Day Ahead market

- System price
- Prices per bidding zone
- Volumes – buy and sell volumes per area
- Available transmission capacities between bidding zones within the exchange area, and on interconnectors to continental Europe
- Flow between bidding zones and on interconnectors to continental Europe

Regulating power (Balancing market)

- Volumes for up or down regulation per bidding zone
- Prices per bidding zone
- Special regulation volume (congestion management)
- Automatically activated reserves

Intraday market

- Prices
- Flows
- Available transmission capacities
- Total Scheduled flow

8 EU No 1227/2011 on Wholesale Energy Market Integrity and Transparency ('REMIT')

3.2.2 Retail markets

The Norwegian Energy Act states that any entity engaged in physical trading, generation and/or distribution of electric energy in Norway is required to hold a trading license. NVE-RME has through the Energy Act been given the authority to grant such licenses and is delegated the power to issue supplementing regulation through terms and conditions of the licenses whenever necessary. The trading license is the basis for NVE-RMEs 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 a power exchange. All trading licenses were renewed in the beginning of 2021.

The licensing regime is light and transparent and does not represent an undue barrier to competition or entry in the market. Since 2020, NVE-RME has used an interactive application form which guides applicants to the rights answers and a business rule engine to handle the applications. This application process reduced the administrative time needed by NVE-RME and is more cost efficient.

Ahead of the renewal process, NVE-RME made a through revision of the terms set in the licenses to ensure a proportionate and consistent regulation of the license holders. Our experiences from (re)applying process for a trading license was that several companies which had a trading license in the previous period, did not reapply as they had ended their business, which gives NVE-RME a better overview of the agents in the market. Furthermore, throughout 2021 we saw a higher number of companies applying due to the legal and functional unbundling for DSOs. During 2021 there were 24 suppliers entering the market, and 11 suppliers which exited the market. In the end of 2021, 689 received a trading license lasting from 1 January 2021 to 31 December 2024. Electricity suppliers supplying end-users, had 141 of these licences, while 97 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 increased. However, most incumbent suppliers still have a dominant position within their local network area. On average, the incumbent supplier has a market share of about 65 percent of residential customers within its own network area. This share has been slowly declining since 2019.

NVE-RME sent secondary legislation mandating separate branding of network operations and commercial activities on public consultation in June 2019. The regulation was adopted in 2020 and will enter into force on 1 January 2022. Separate branding is assumed to increase the competitive pressure in the end-user market by making it easier for end-user to identify electricity suppliers and DSOs, and to understand their different and independent roles.

NVE-RME banned supply contracts that violated billing and settlement regulation

After monitoring electricity supply contracts offered by suppliers in the Norwegian market, NVE-RME decided to ban Equal price per month contracts (EPC) after the decision that the contract type violated regulation on settlement and billing. With EPCs, the supplier bills the household consumer for the same amount of money each month for delivery of electric power and network-services, regardless of the actual consumption and spot prices within the billing period. The billing amount is calculated to represent the average monthly payment of one year's consumption, based on the supplier's forecast of prices and consumption for a specific consumer. Due to the variation of electricity demand over the year, an EPC– household consumer will systematically receive too high invoices during the summer, and correspondingly too low invoices during the winter.

NVE-RME found that the EPCs violated regulation on billing because the bills are not based on actual, metered consumption. Furthermore, according to national regulation, consumers should be billed and settled at least every three months. EPCs typically had yearly settlement. Lastly, the EPCs were not in line with the regulation on advanced payment which only allows for billing 10 weeks in advance of delivery.

In 2020, NVE-RME issued decisions requiring that the suppliers should stop selling this product to household customers and existing customers on EPC contracts should be transferred to other contract types. In 2020, all the companies which received a decision contested the decision to the independent Appeal Body. In September 2021 the Norwegian Energy Appeal Body reached their conclusion, which supported NVE-RME's decisions in all the cases against the eight suppliers. Three of the suppliers chose to file a lawsuit in January 2022. The Court upheld the decision made by the Norwegian Energy Appeal Body.

The Norwegian price comparison tool
The Norwegian price comparison tool is operated by the Norwegian Consumer Council. The comparison tool was visited 849 865 times during 2021. In March 2021, NVE-RME announced to suppliers that NVE-RME will consider monetary reactions to suppliers who fail to report all contracts offered to household consumers or report incorrect information to the comparison tool. NVE-RME and the Consumer Council have established a cooperation to enforce the obligation of suppliers to report all active contracts to the comparison tool. The cooperation improves communication between NVE-RME and the Consumer Council regarding possible violations and enables us to issue decisions on lacking or faulty reporting quicker.

The Norwegian price comparison tool ranks contracts according to the estimated total cost of energy for household consumers per month in a bidding zone, including taxes. NVE-RME advises 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 on their bill.

NVE-RME regulates the collection of information for Consumer Council's price comparison tool under the Energy Act regulations. When developing the regulations for collecting information for the comparison tool, a key principle for NVE-RME was to ensure that all contracts in the market are presented in the price comparison tool.

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

There are no regulated prices in Norway. Customers who have not yet chosen a supplier shall, the first six weeks, be served by their local DSO (supplier of last resort) with a maximum price of øre/kWh 5 excl. VAT (or øre/kWh 6.25 incl. VAT) above spot price. After 6 weeks, the supplier of last resort is obliged to set the price and terms in a way that gives an incentive to the customers to find a supplier in 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 the NVE-RME website to inform their customers about the costs imposed by the electricity certificate obligation.

In 2021, electricity consumers paid for electricity certificates amounting to 19.3 percent of their total electricity consumption. 2021 is the last year for approving new facilities in the scheme, so the quota curve has gradually increased until 2021. Thereafter, the quota share will decline towards 2035 as the electricity certification scheme faces out. The actual additional cost paid by the consumers varies according to supply and demand. On average, a customer paid an additional 2.3 øre/kWh (including VAT) due to electricity certificates in 2021. This means that a household using 20,000 kWh of electricity in 2021, paid a total cost of approximately 460 NOK (including VAT).

In the retail market, general competition legislation (The Norwegian Competition Act and the competition rules applicable through the EEA Agreement) apply. The physical power exchanges, Nord Pool European Market Coupling Operator AS and EPEX Spot SE, operates under marketplace license issued by NVE-RME pursuant to the Norwegian Energy Act. Marketing and selling of electricity contracts are regulated by the Norwegian Consumer Protection Authority.

Retail market electricity prices

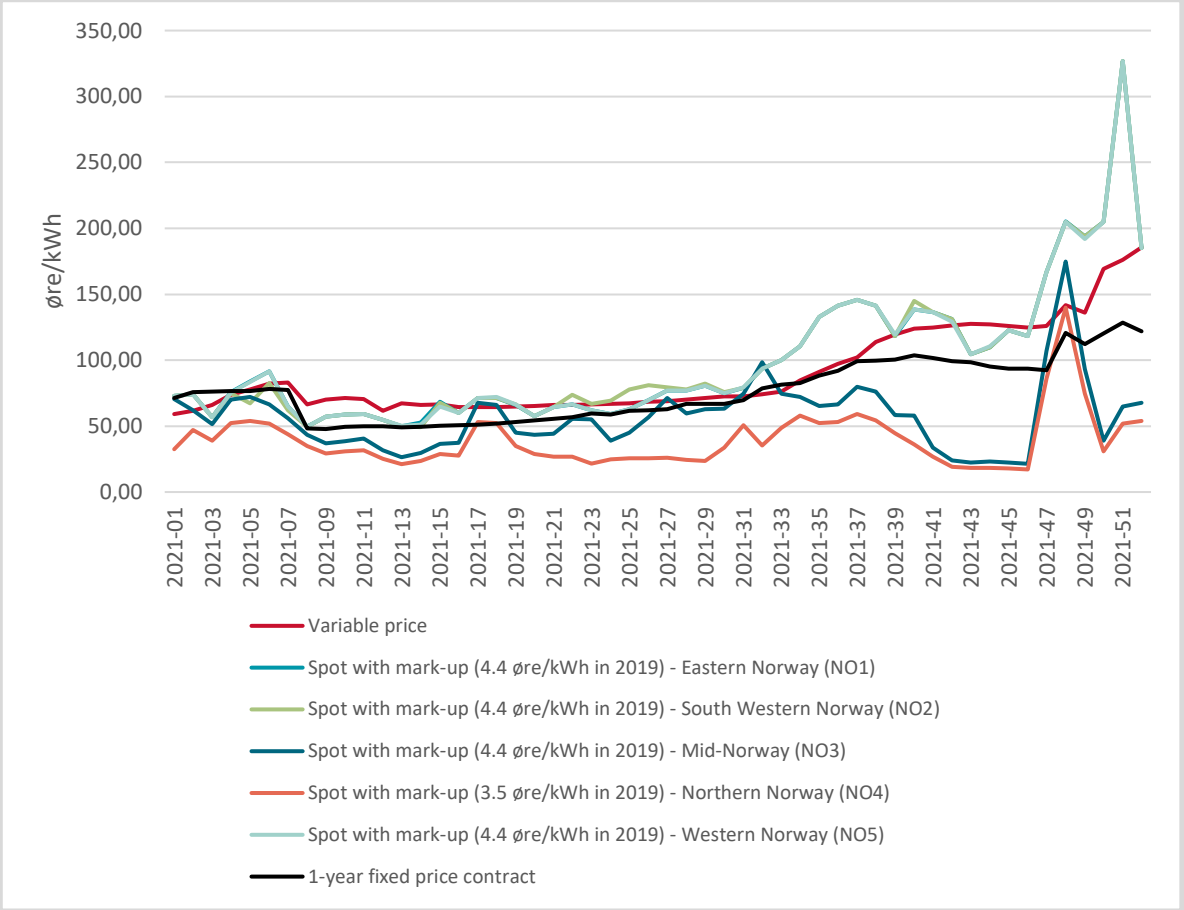


Figure 11. Price development for different contract types in the Norway in 2021

Figure 11 shows the average price development in 2021 for different contract types in Norway. Namely, spot price contracts in different bidding zones, variable price contracts and 1-year fixed price contracts. Around 75 percent of the household customers has spot-based contracts, 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[9].

The listed prices for spot price contracts in the figure include VAT and a mark-up of øre/kWh 4.4, except for the bidding zone Northern Norway, where the spot price excludes VAT and includes a mark-up of øre/kWh 3.5. The mark-ups are calculated by NVE-RME 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. Prices for variable contracts and fixed price contracts show the weekly average price of contracts reported to the public comparison tool.

Historically, spot price-based contracts have been lower than variable price- and fixed price-contracts. During the last six months of 2021, this changed when comparing fixed price and variable price contracts to the southern bidding zones. The increase of the spot prices in the three southern bidding

[9] Electricity price. Statistics Norway https://www.ssb.no/en/statbank/table/09364

zones during the last six months of 2021 resulted in spot price contracts being more expensive than variable and fixed price contracts.

3.2.2.2 Promotion of higher consumer participation and measures for a more efficient electricity retail market

As part of the goal to further increase competition and efficiency in the market, smart hourly metering (AMI) and a national point of data management (Elhub) was implemented. The smart meter roll-out was completed 1 January 2019 and the go-live of the datahub was in February the same year. The implementation of Elhub standardises the exchange of hourly metering data, simplifying the communication of metering data in the chain between the DSOs, suppliers, and consumers. NVE-RME considers active, well-informed consumers to be key for the Norwegian retail market. Smart meters provide real-time consumption data, and price signals through dynamic price contracts give incentive for energy efficiency and peak load management, by enabling consumers to adjust consumption to price variations.

In general, NVE-RME aims at identifying and reducing barriers that keep consumers from being actively involved in the retail market. By providing information about the national price comparison tool and presenting a compilation of average retail market prices on a weekly basis, NVE-RME encourages consumers to ensure that their contracts are among the most competitive ones.

In 2021 NVE-RME received a report on the current situation of household customers in the Norwegian retail market that investigates challenges consumers face when they buy electricity. The consultants investigated to what extent the retail market could be improved within the existing regulatory framework or if the regulation needs to be updated. The complete legal framework regulating the retail market for the consumer, including consumer protection legislation and energy legislation were considered. The report concludes that information asymmetry is one of the most significant issues in the retail market and that some consumers probably pay more than they should for their electricity. The report suggests several measures that can be implement to improve the information in the retail market.

3.2.2.2.1 Retail market statistics

NVE-RME 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 estimate of the average accumulated electricity cost for the customers. The Norwegian Consumer Council and Nord Pool provides the data that is published in a weekly report on NVE-RME's website. The report is regularly referred to by the public media. We also publish similar retail market data in a quarterly report on the energy market.

NVE-RME produces statistics on a regular basis to assess the retail market functioning. Norway has a national programme that defines and delimits official statistics[10]. The retail market statistics is a part of this programme and must satisfy a set of quality requirements. An example of such a requirement is

[10] National programme for official statistics: https://www.ssb.no/en/omssb/lover-og-prinsipper/nasjonalt-program-for-offisiell-statistikk

that the statistics must be produced in a professional and transparent manner independent of political and other influences.

In 2020, NVE-RME replaced DSO survey data with data from the national hub (Elhub). By using data from Elhub, the production process has become more efficient and the response burden for the DSOs has been reduced. The project has given NVE-RME more detailed and accurate data to monitor and assess the retail market. Among the metrics used are supplier switching rates, share of customers supplied by suppliers of last resort and supplier market shares. In 2021, NVE-RME continued to develop the retail market statistics, and plan to produce a report on inactive customers.

In 2021, NVE-RME published a report on prosumers for the first time, with data also collected from Elhub. The report shows that the number of prosumers has increased from 2,340 in the beginning of 2019 to 9,128 at the end of 2021. Furthermore, the report visualises the seasonal changes of the prosumers feeding into the network and their consumption.

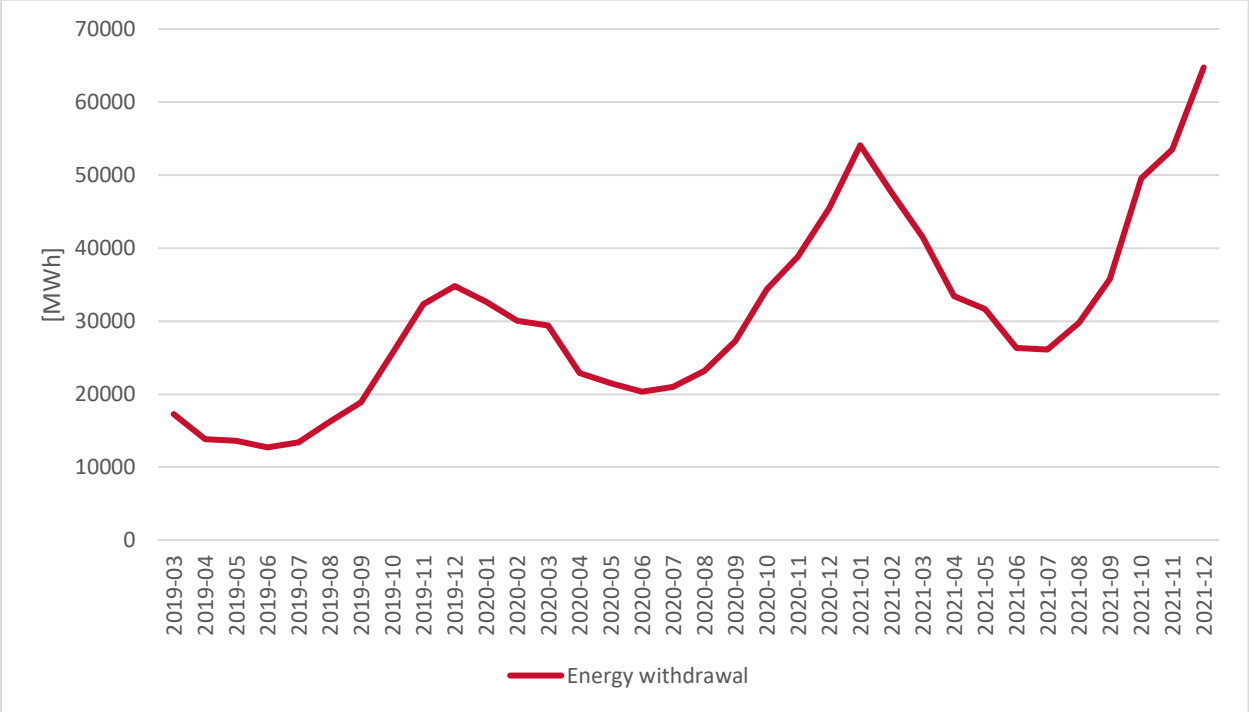


Figure 12 *Total energy use made by prosumers each month between March 2019 and December 2021*

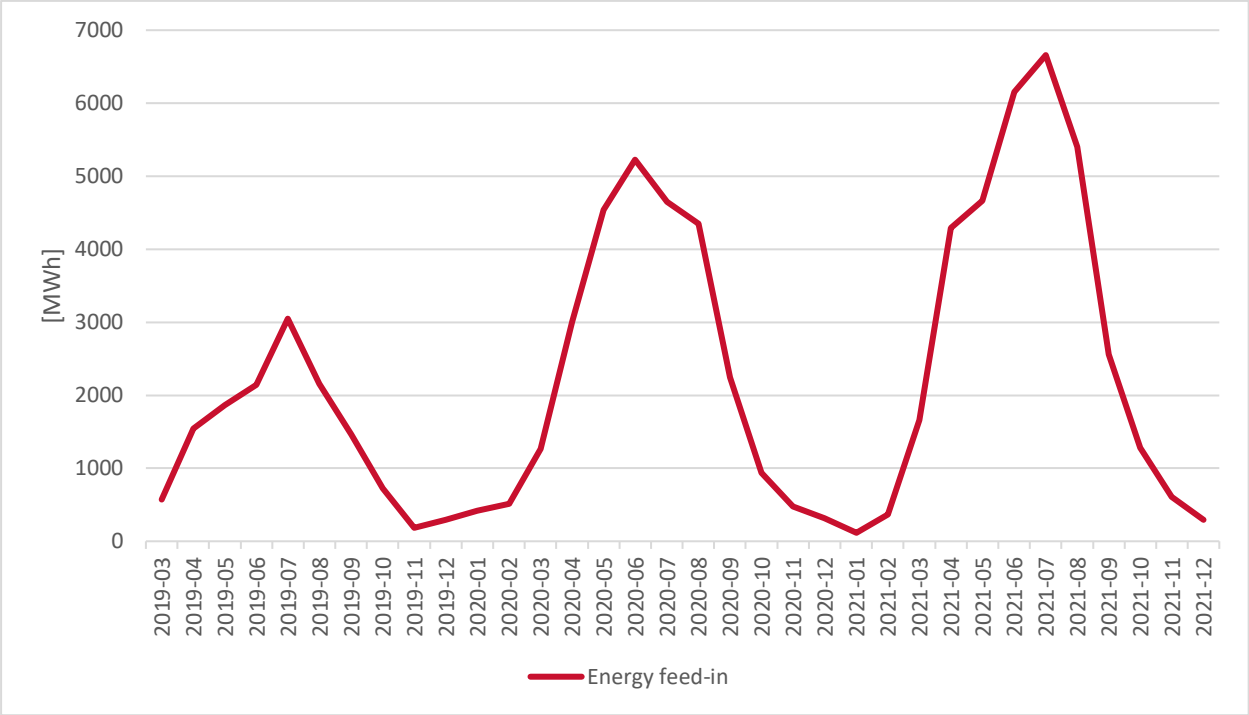


Figure 13 *Total energy feed-in from prosumers each month between March 2019 and December 2021*

In 2021 there were 711,000 supplier switches resulting in a switching rate of 21 percent.[11] The share of final household customers supplied by the supplier of last resort was 2 percent in the end of 2021, a reduction of 18 percent from 2019. Both measures indicate more active consumers.

The market share of the three largest suppliers in the household sector by metering points has been just below 40 percent for several years. The Herfindahl-Hirschman Index (HHI) measures the level of concentration in a market. The HHI for the household customers measures 740. The low concentration can be explained by a high number of suppliers, and it indicates a competitive market structure.[12]

[11] Incl. both household and non-household customers

[12] The Herfindahl-Hirschman Index (HHI) measures the degree of concentration in a market. Based on guidance from the European Commission an HHI of above 2,000 signifies a highly concentrated market. 2017 Handbook for National Energy Regulators: how to assess retail market functioning https://www.ceer.eu/documents/104400/-/-/840b4ce7-9e4a-5ecc-403a-fad85d6ba268.

3.3 Security of supply

3.3.1 Monitoring balance of supply and demand

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. It has not been necessary to activate energy rationing in Norway.

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

Both the Norwegian TSO and NVE-RME analyse the possible development in the energy and power balance. When it comes to monitoring the market development, regular reports are published.

In strained operational situations or during operational disturbances

Through the Norwegian regulation on system operation, 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 using 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 in the case of extreme situations. 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 always momentary balance and to ensure the energy balance during the winter season. Statnett is obliged to inform of the findings. The different measures with conditions are approved before they enter into force. Permanent- and operational costs for the different measures are handled within Statnett's revenue cap.

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

- To reduce risk of electricity rationing
- Must be effective for handling of extreme situation, and at the same time does not influence the electricity market or investment decisions within the production or the network
- Maintain TSO neutrality and independent position in the power market
- Contribute to a socio-economic handling of extreme situations and to maintain the efficiency of the physical power market
- Take into consideration the already existing flexibility in production, transmission and consumption

Electricity peak demand

Domestic gross energy consumption was 139.5 TWh in 2021, an increase from 133.7 TWh in 2020. The Norwegian peak demand normally occurs in the winter season. The peak electricity demand was 25,230 MWh/h in 2021, which is the highest peak demand registered.

Table 6. Peak demand for the last 10 seasons. Source: Statnett.

Year	Weekday	Date	Hour (CEST)	Demand [MWh/h]
2010	Wednesday	06.01.2010	8	23,994
2011	Monday	21.02.2011	8	22,129
2012	Wednesday	05.12.2012	8	23,443
2013	Wednesday	23.01.2013	8	24,180
2014	Thursday	22.01.2014	9	23,489
2015	Wednesday	04.02.2015	8	22,530
2016	Thursday	21.01.2016	8	24,485
2017	Thursday	09.02.2017	8	23,246
2018	Thursday	01.03.2018	8	24,108
2019	Thursday	31.01.2019	17	23,672
2020	Friday	28.02.2020	8	21,861
2021	Friday	12.02.2021	9	25,230

Currently available generation capacity

The total installed generation capacity in Norway was 38,940 MW in 2021. Available generation capacity during a cold winter is estimated to be approximately 26,600 MW by Statnett. The wind power generation capacity increased by 672 MW from 2020 to 2021, whereas the hydro power generation capacity increased by 400 MW. The amount of wind power under construction was 677 MW by the end of 2021.

Table 7. Generation fuel mix 31.12.2021. Source: NVE

	Installed capacity (MW)	Mean annual generation (TWh/y)	Net capacity added (MW)	Under construction (MW)	License/permit given, not yet built (MW)
Wind power	4,650	15.5	672	677	926
Hydro power	33,403	137.9	400	424	1,415
Thermal power	700	3.5	0	0	0
Solar power	187	0.16	45	N/A	N/A
Sum	38,940	157.1	1,117	1,101	2,341

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

The responsibility to coordinate long-term power system planning is delegated to 17 owners of the distribution network (33 – 132 kV). Each of these are responsible for planning the distribution network in a specific area, in cooperation with other network owners and other relevant parties. The Norwegian TSO is responsible for operation and planning of the national transmission network (132 kV-420 kV).

Every second year, the responsible network companies in the distribution planning areas and Statnett present updated regional and national network development plans. The timeframe for the network development plan is minimum 20 years. The plan must describe the present network, future transmission and distribution conditions together with anticipated measures and investments. The plan describes generation, transmission and consumption of electricity, and includes conditions that are of importance for the development of the power system in the area. Simplified socio-economic analysis must be presented for all network investments that require environmental impact assessment (EIA). The main objective of the power system studies is to contribute to a socioeconomic rational development of the regional distribution networks and the transmission network.

3.3.2 Monitoring investment in generation capacities in relation to SoS

Authorization criteria for new generation investments and long-term planning

For all new projects (wind-, gas – and hydro power plants, power lines, transformers) a license to build and operate must be granted. The profitability, public and private interests and environmental issues will be considered for every project.

The responsibility for power system studies is delegated to an appointed licensee in each 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 the 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

NordLink and North Sea Link
In October 2014 Statnett was granted licenses to build two HVDC cables to Germany and UK respectively, each with a capacity of 1400 MW. The NordLink cable to Germany was in operation from December 2020. The interconnector between Norway and UK, North Sea Link, started construction in 2018 and has been in operation from 1 October 2021.

Greater Oslo Network Plan
A series of licenses have been given to Statnett to replace older cables and lines and ensuring security of supply to the Oslo region. Construction on new lines started in 2017.

Western Corridor
During the period leading up to 2021, Statnett will upgrade the voltage in the Western Corridor from the current voltage of 300kV to 420kV. The Western Corridor is a collective term for the main network in south-western Norway, including the counties of Aust-Agder, Vest-Agder and Rogaland. This will enable renewable integration, increase security of supply and reduce constraints on the interconnectors.

Sogndal-Aurland
Statnett is planning to upgrade the 300 kV power line Sogndal-Aurland to 420 kV
voltage. This will increase the transmission capacity southwards from Sogndal and facilitate new wind and hydro production. The project is in a permitting process.

Expected future demand and envisaged capacity

Statnett expects network investments of 5.9 – 9.8[13] billion euros in the period from 2021 to 2030. This estimate includes investments in offshore grid at approximately 1 billion euros. The network investment level will ensure a reliable power supply, facilitate renewable energy projects, electrification as well as industrial and commercial development throughout Norway.

[13] NOK 1 = EUR 0.0983

3.3.3 Measures to cover peak demand or shortfalls of suppliers

The quality and level of maintenance of the networks

The CENS arrangement referred to in chapter 3.1.2 is the main regulatory tool to ensure a proper level of maintenance of the networks. In addition, NVE-RME carries out audits on companies regarding operation and maintenance. The quality of the maintenance is monitored on these audits.

Measures to cover peak demand

Peak demand is handled through market mechanisms, where price signals through the day ahead, intraday and balancing markets provide incentives for market participants to adjust their consumption and production accordingly.

3.3.4 Cybersecurity

Smart metering systems

Late summer 2021, the Norwegian Ministry of petroleum and Energy adopted improved regulatory rules on cybersecurity for smart metering systems. The changes include more clear and precise requirements on security assessments, authentication, confidentiality, incident containment and system resilience. More clear minimum requirements for smart metering systems had been welcomed by the industry since 2018. The improved rules were proposed to the Ministry by RME who also have delegated supervisory responsibility for this regulation.

Supervisory activities

In 2021, NVE-RME conducted two audits of smart meter system security. The purpose was to investigate the fulfilment of cybersecurity requirements in the smart meters. The audit methodology is similar to the ISO27001 Information Security Management System certification audit methodology and focuses on documented processes. Audit scope was secure storage of metered data, access control and incident handling. The main strengths identified from the audits were that a strong access control for smart metering systems were implemented, and modern technology in form of artificial intelligence and multifactor authentication is implemented to protect stored data. Areas of improvement is that high complexity of smart metering systems allows many access points to metered data. Examples are cloud based smart meter applications integrated with legacy onsite applications. As a result, data can be accessed in cloud applications, integration systems and onsite applications. Access control becomes more complex when there are many access points. Another observation is that the audited entities have potential for improvement on cybersecurity risk management, especially documented processes for risk analysis.

NVE-RMEs engagement within cybersecurity has increased

In 2021, a cybersecurity expert from NVE-RME was seconded to ACER and participated in the work to establish a framework guideline for a planned network code on cybersecurity.

4. THE GAS MARKET

Although Norway is a large gas producer, only 890 GWh (2021) is distributed in gas distribution networks. The Norwegian gas market is small and is expected to remain small.

There are two local areas with gas distribution networks in Rogaland in the southwestern part of Norway. Both are connected to the upstream pipelines from Kårstø gas processing plant, and they use injected tail gas from LNG production facilities in addition to natural gas. There is no transmission network in Norway as defined in EUs third Gas market Directive.

NVE-RME is the national regulatory authority for gas distribution. The current regulation was changed from November 2019 to comply with the directive 2009/73/EC (Gas market directive).

From 1 February 2021, the Ministry of Petroleum and Energy designated the companies in the two areas described above the role as distribution system operators. NVE-RME will from 2022 verify tariffs, terms and conditions for third-party access to one of the networks.

5. CONSUMER PROTECTION AND DISPUTE SETTLEMENT IN THE ELECTRICITY MARKET

5.1 Consumer protection

Network companies are obliged to connect customers within their license 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 Protection Authority. 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. In previous years, the Norwegian

Parliament granted funds to reduce network tariffs for customers in areas with the highest distribution costs. The sum was gradually reduced and 2018 was the first year when no funds were allocated to this purpose.

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

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

5.2 Dispute settlement

NVE-RME has been authorized to monitor compliance with, and to take decisions according to the Energy Act and regulations laid down in accordance with the Act. NVE-RME handles complaints and disputes regarding network regulation and tariffs, customer compensation for energy not supplied above 12 hours, 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 Energy Appeal Body handles complaints on NVE-RMEs decisions. In 2021, the Norwegian Energy Appeal Body received 35 written complaints and reached a decision in 30 cases.

Appendix

Table 8. 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
2015	2.8	2.1	4.4	1.3	3.3
2016	2.1	1.9	3.5	1.1	3.1
2017	1.8	1.7	3.0	1.1	2.8
2018	2.8	2.3	4.5	1.2	3.7
2019	1.8	1.7	3.3	1.1	3.1
2020	2.2	2.0	3.9	1.1	3.5
2021	2.1	1.7	4.0	1.3	3.1

Table 9. 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
2015	1.5	1.9	3.3	0.8	4.4
2016	1.2	1.7	2.9	0.7	4.1
2017	1.1	1.6	2.7	0.7	3.7
2018	1.5	2.1	3.5	0.7	4.8
2019	1.2	1.6	2.7	0.7	3.7
2020	1.4	1.8	3.4	0.8	4.5
2021	1.1	1.4	2.8	0.7	3.8

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