

National Report on the state electricity and gas markets in Finland  
to the Agency for the Cooperation of Energy Regulators and to the  
European Commission

Year 2022

Finland

## CONTENT

<b>Foreword .....</b>	<b>3</b>
<b>Main developments in electricity and gas markets.....</b>	<b>4</b>
<b>2.1 Electricity market development .....</b>	<b>4</b>
<b>2.2 Gas market development.....</b>	<b>5</b>
<b>2.3 National electricity and gas market regulation development.....</b>	<b>6</b>
<b>Electricity market.....</b>	<b>7</b>
<b>3.1 Network regulation .....</b>	<b>7</b>
3.1.1 Unbundling .....	7
3.1.2 Network extension and optimization.....	8
3.1.3 Network tariffs .....	9
3.1.4 Security and reliability regulation.....	11
3.1.5 Monitoring balance of supply and demand .....	11
3.1.6 Cross-border issues .....	13
3.1.7 Implementation of Network Codes and guidelines .....	14
3.1.8 Monitoring and assessing the development of a smart grid .....	18
<b>3.2 Competition and market functioning .....</b>	<b>20</b>
3.2.1 Wholesale markets .....	20
3.2.2 Retail market .....	25
3.2.3 Consumer protection and dispute settlement.....	30
<b>Gas market .....</b>	<b>35</b>
<b>4.1 Network regulation .....</b>	<b>35</b>
4.1.1 Unbundling .....	35
4.1.2 Network extension .....	36
4.1.3 Network and LNG tariffs for connection and access .....	36
4.1.4 Balancing .....	38
4.1.5 Cross-border issues .....	38
4.1.6 Implementation of Network Codes and guidelines .....	39
<b>4.2 Competition and market functioning .....</b>	<b>39</b>
4.2.1 Wholesale markets .....	39
4.2.2 Retail market .....	42
4.2.3 Consumer protection and dispute settlement.....	44
<b>4.3 Security of supply.....</b>	<b>45</b>
4.3.1 Monitoring balance of supply and demand .....	45
4.3.2 Measures to cover peak demand and shortfalls of suppliers.....	46

# Foreword

This national report is prepared by the Energy Authority to the Agency for the Cooperation of Energy Regulators and to the European Commission on the state of the Finnish electricity and natural gas markets as required by Article 59(1)(i) of the Directive for the Internal Market in Electricity (2019/944/EC) and Article 41(1)(e) of the Directive for the Internal Market in Natural Gas (2009/73/EC).

The report covers the main steps the Energy Authority has taken, and the results obtained as regards each of the tasks listed in Article 59 of the Electricity Market Directive and Article 41 of Natural Gas Market Directive. It contains a description of the powers and tasks of the Energy Authority as a national regulatory authority, an overview of the regulation and performance of electricity and natural gas sectors.

The report covers main developments during the period from January to December in 2022 and data presented in the report reflects this period as far as possible. In some points also the recent developments in 2023 are mentioned.

In 2022, the Energy Authority has continued active participation in the implementation of European network codes and guidelines. In the implementation the focus has already been some years in regional – Nordic and Baltic – approval processes.

Russia's invasion to Ukraine in February 2022 has heightened the energy crisis in Europe. Since May 2022, electricity and gas import from Russia to Finland has been suspended. This has led to fundamental changes in gas market structure as Finland had to find additional gas sources in a short period of time. Two new LNG terminals in Hamina and Inkoo are commissioned and, also gas import from Baltics is playing an important role ensuring gas supplies in Finland.

The energy crisis was also characterised by the sharply increased gas prices in whole Europe especially during fall 2022. This together with relatively low hydro reservoir levels in Nordics resulted high gas and electricity wholesale and retail prices also in Finland. The Finnish government has designed and introduced some temporary measures – lower VAT rate for electricity, tax credit for electricity, assistance with electricity costs, retroactive reimbursement for electricity costs and extended payment periods of electricity bills – to help those consumers which were suffered by high electricity prices.

The Clean Energy Package was adopted in EU in 2019, but the implementation of the Directive for the Internal Market in Electricity into national legislation was delayed in Finland. Finally, necessary amendments came into force on 1 June 2023. Instead of being just a national regulatory authority of the electricity and gas markets, the Energy Authority has tasks also as the national emissions trading authority and to promote renewable energy and energy-efficiency.

Simo Nurmi  
Director General  
Energy Authority

# Main developments in electricity and gas markets

## 2.1 Electricity market development

Electricity consumption in Finland decreased in 2022 by 6 per cent. Consumption was decreased mainly during winter months – especially in February, November and December. In December 2022 consumption was decreased by 16 per cent compared to consumption in December 2021.

The state administration launched in October 2022 a nationwide campaign<sup>1</sup> to encourage citizens and enterprises to save energy. The short-term goal for the campaign has been to get over 95 per cent of Finnish households to save energy and cut down on their consumption by 5 per cent during peak hours. The long-term goal is to permanently lower energy consumption and reduce electricity consumption peaks. In winter 2022–2023, the campaign aimed to help Finns start saving energy quickly and effectively through concrete measures. The aim was to reduce energy consumption throughout society: in homes and housing companies, companies, municipalities, organisations and educational institutions.

The share of net import covered 15 per cent of consumption and decreased from 2021 (in 2021 share was 20 per cent). This was mainly due to suspended electricity import from Russia since May 2022. The net import from other Nordic countries (mainly from Sweden) increased by 3 per cent. The net export to Estonia and further to Baltic states increased by 2 per cent.

Domestic wind power generation increased by 43 per cent and covered about 17 per cent of electricity generation in Finland. Hydro power decreased by 13 per cent compared to 2021. In 2022 share of hydro was 19 per cent. Share of nuclear power was 35 per cent of electricity production in Finland. Share of biomass in electricity production was decreased. Share of gas in power production was about 1.5 per cent and decreased by 72 per cent. Total domestic electricity generation remained stable and was 69 TWh.

In peak load situation the available Finnish generation capacity is not enough to cover the demand. The Energy Authority has estimated in autumn 2022 total available generation capacity in the market during the peak load situation in winter 2022 - 2023 to be about 11,300 MW as the start of commercial operation of Olkiluoto 3 nuclear power plant was delayed until April 2023. The highest hourly load in 2022 was 13,767 MWh/h. The interconnector capacity between Finland and neighbouring countries has been enough to cover the deficit in own generation capacity during the peak load situations.

Relatively low hydro situation in Nordics and high gas prices increased electricity prices in Finland as in other European countries. Available electricity transmission capacity from Sweden to Finland has not always been enough for to cover market needs. Since 2021, Swedish TSO Svenska Kraftnät has also restricted available transmission capacity from Finland to Central Sweden (SE3 bidding zone). In 2021 number of hours when the wholesale electricity day ahead prices in Finland were same as in Sweden decreased. Last year Finland and Northern Sweden (SE1) had same day-ahead price in 27 per cent of hours (40 per cent in 2021). With the Central Sweden (SE3) Finland had same day-ahead price in 57 per cent of hours (71 per cent in 2021). In 2022, Finland and Estonia had same price in day ahead market in 62 per cent of hours (60 per cent in 2021).

Based on the Capacity Reserve Act the Energy Authority has responsibility to estimate and procure capacity reserves needed to ensure the balance between supply and demand (strategic reserve). The Government adopted in March 2022 based on the proposal from the Energy Authority the reliability standard LOLE=2.1 hour per year. Based on this the Energy Authority estimated in June 2022 that Finland should need 600 MW of peak load reserve to meet this stand-

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<sup>1</sup> <https://www.astettaalemmas.fi/en>

ard during period November 2022 – October 2023. In summer 2022 the Energy Authority organized a tender for strategic reserve capacity but didn't acquire any capacity for the peak load reserve as the only received bid was rejected because did not fulfil the requirement set in the national legislation.

In 2022, the supplier switching rate was at the same level as in 2021. About 16.3 per cent of electricity customers in Finland switched their electricity supplier in 2022. However, this number includes also some switches which were caused by restructuring of some supply companies. In 2022, two electricity retailers ended their electricity supplies to their customers. Further, several electricity retailers decided to offer only dynamic priced supply contracts for new customers due to increased hedging costs.

## 2.2 Gas market development

In 2022 gas consumption in Finland was decreased by 52 per cent and was 11.7 TWh. This decrease was influenced by high gas prices and uncertainties with security of supply. Especially, heat and power plants and industrial end users reduced their gas use. Some remarkable end users also decided to use alternative fuels instead of gas. Gas consumption in heat and power generation decreased in 2022 by 76 per cent and gas consumption by industrial customers connected to the transmission grid decreased by 35 per cent. Gas delivery from the transmission grid to distribution grids decreased by 53 per cent.

About 59 per cent of natural gas imported to Finland in 2022 was imported from Baltic states through the Balticconnector pipeline (in 2021 about 25 per cent). About 3 per cent of imported gas was imported through Hamina LNG terminal which was opened in October 2022. The rest was imported from Russia through Imatra interconnection point during January-May 2022. Finland exported 0.6 TWh of gas to Estonia via Balticconnector.

Since May 2022, gas import from Russia to Finland has been suspended. To improve security of supply situation, Finnish gas TSO leased a floating LNG-terminal vessel which arrived Inkoo in December 2022 and was ready for receiving LNG cargoes in January 2023.

Finland together Baltic states has several years been developing a regional gas market. In 2019 a separate inter-TSO compensation agreement was signed between the Finnish, Estonian and Latvian TSOs and a common tariff area has been established since the beginning of 2020 between Finland, Estonia and Latvia. In the common tariff area entry tariffs are unified and the tariffs from internal border points have been removed since the beginning of 2020.

In April 2020, energy ministries, regulators and transmission system operators from Estonia, Finland, Latvia and Lithuania gave their agreement to a roadmap<sup>2</sup> establishing a process for the future regional gas market integration of their respective countries. The objective is to establish a merged, regional gas market in Estonia, Finland, Latvia and Lithuania, encompassing all four Member States, with the objective to improve market liquidity, integration and competition, ensuring affordable gas prices and high quality of service - thus being attractive for existing and new market participants. However, because of the geopolitical situation in 2022 which has caused significant changes in the fundamentals of the region's gas market, merging of regional gas markets and the development of updated ITC mechanism between TSOs have been postponed until market will be more stabilised.

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<sup>2</sup> [https://ec.europa.eu/info/news/baltic-regional-gas-market-roadmap-will-mark-first-cross-border-gas-market-merger-between-4-eu-countries-2020-apr-20\\_en](https://ec.europa.eu/info/news/baltic-regional-gas-market-roadmap-will-mark-first-cross-border-gas-market-merger-between-4-eu-countries-2020-apr-20_en)

## 2.3 National electricity and gas market regulation development

On 1 February 2019, new provisions to the electricity market legislation which enable implementation of a centralized data exchange (Datahub) in electricity retail markets in Finland came into force. In 2021, the Energy Authority supervised whether all DSOs and retailers have made their preparatory actions for Datahub implementation. Datahub went go-live on 21 February 2022.

In December 2020, the Government adopted amendments to the regulation which facilitates establishment of local energy communities and groups of active customers. The regulation allows netting of electricity input and output through the same meter to the distribution grid within imbalance settlement period. This includes also dividing feed-in from the generation to the members of the community or group in the balance settlement. These amendments facilitate eg. establishing local energy communities within housing cooperatives where a cooperative invests in joint solar panels in the rooftop and the electricity from the panels will be shared among the members of the cooperative. Amendments have come into force 1 January 2021. However, netting for local energy communities and groups of active customers will be done in the Datahub from 1 January 2023. Before that, DSOs were able to decide by themselves if they are willing to provide the netting service to their customers.

On 1 August 2021, came into force amendments into the Electricity Market Act which strive to restrain increase in electricity distribution prices. Amendments limit maximum increase of electricity transmission and distribution charges into 8 per cent from previous 15 per cent. Further, it includes provisions which gives power to the Energy Authority to monitor cost efficiency in network investments and requires DSOs to assess alternatives for network investments in their network development plans.

Amendments to the Capacity Reserve Act came into force on 1 January 2022. After these amendments the Act is in line with capacity mechanism provisions concerning strategic reserves set in the Regulation on the Internal Market for electricity (2019/943).

In Finland, the Ministry of Economic Affairs and Employment has been responsible for preparing amendments to the national legislation to implement provisions of the Clean Energy Package (CEP). Amendments to the national legislation to implement the electricity market directive was adopted by the Parliament in February 2023 and came into force on 1 June 2023.

To help electricity customers suffering from the heavily increased electricity prices, the Government introduced several measures. VAT on electricity sales was temporarily reduced from 24 per cent to 10 per cent, excluding network-related charges during period of 1 December 2022 to 30 April 2023. Also, the Government decided that payers of very high electricity costs during January – April 2023 may apply a tax credit from the Tax Authority. In addition, if customer's taxes for the year are low, so the tax credit for electricity would not be useful, the customer can instead apply to Kela for temporary electricity assistance. The Parliament also adopted in February 2023 a temporary law on retroactive reimbursement for electricity supply costs during November 2022 – January 2023 for consumers. Finally, the Parliament also adopted in February 2023 also a temporary law for extended payment periods of electricity bill.

Instead of capping market revenues from inframarginal generation as mentioned in the Council Regulation (EU) 2022/1854, Finland decided to set a temporary profit tax in the electricity sector for 2023. Tax is payable by companies engaged in electricity production or electricity supply.

# Electricity market

## 3.1 Network regulation

Some key indicators for illustrating the development electricity network in Finland are shown in the following table (Table 1).

**Table 1. Indicators for electricity network (2022 figures preliminary)**

Indicators	2019	2020	2021	2022*
Number of TSOs	1	1	1	1
Number of high-voltage DSOs <sup>3</sup>	10	9	9	9
Number of DSOs	77	77	77	77
Length of electricity grid (km)				
• 400 kV (km)	5,500	5,500	5,500	5,700
• 220 kV (km)	1,300	1,300	1,400	1,000
• 110 kV (km)	16,500	16,500	16,600	16,300
• 1-70 kV (km)	152,900	154,200	154,700	156,000
• 0.4 kV (km)	251,400	254,300	256,400	281,700

### 3.1.1 Unbundling

#### **TSO unbundling and certification of TSO**

Finland has chosen ownership unbundling model for unbundling of electricity transmission system operators (TSO). Before an undertaking is approved and designated as a transmission system operator, it shall be certified to have complied with the ownership unbundling requirements set in the Article 43 of the Electricity Directive. According to the national legislation, transmission system operator shall own transmission network it operates.

In 2022, there were no changes in the ownership of Finnish TSO, Fingrid. Majority (53.14 per cent) of shares of Fingrid is owned by the State of Finland and the National Emergency Supply Agency, while the rest is owned by Finnish financing and insurance institutions.

The Energy Authority made the decision on the certification of Fingrid on March 14, 2014.

#### **DSO unbundling**

Total number of distribution system operators (DSOs) having lower than 110 kV voltage level network was 77 at the end of 2022. Further, there are 9 high-voltage distribution system operators having only high-voltage 110 kV network.

The Electricity Market Act requires, that electricity network operations must be legally unbundled from electricity trade operations and electricity generation if the annual quantity of electricity transmitted to the customers through the network operator's 0.4 kV distribution network has been 200 GWh or more during three consecutive calendar years.

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<sup>3</sup> Distribution system operators having only 110 kV or above grid

Totally, 37 DSOs were in 2022 over the threshold value. In addition, some other DSOs have voluntarily legally unbundled network activities. At the end of 2022, a total of 54 DSOs were legally unbundled.

The requirement for separate management for the electricity network company and requirements for professional interests and compliance programmes are applied in Finland only to legally unbundled system operators having 50,000 customers or more. At the end of 2022 these requirements were applied to 20 DSOs in Finland.

### **3.1.2 Network extension and optimization**

#### **Investments plans**

In 2022, Fingrid continued to develop the internal transmission system significantly to increase the capacity of the main transmission corridor in North to South direction to accommodate rapidly increasing renewable energy. Increasing market integration and intermittent generation demands flexibility not only from generation but also from the transmission system. Also, old East to West connections of Southern Finland at the end of technical lifespan are being replaced with more modern ones.

In 2022, Fingrid invested by EUR 246.0 million of which investments to the grid were EUR 178.6 million. Investments to the grid were increased by EUR 67.4 million from year 2021 and Fingrid plans to increase annual grid investments even over EUR 300 million by 2023.

In December 2016 Fingrid and Swedish TSO, Svenska Kraftnät announced their agreement to build up a new AC-interconnector between the two countries by 2025. This project – Aurora-line – is included in the 4<sup>th</sup> list of Projects of Common Interest published by European Commission in October 2019<sup>4</sup>.

According to the Finnish Electricity Market Act, all DSOs shall submit updated network development plans (NDP) to the Energy Authority bi-annually. The NDPs should include actions which demonstrate that each DSO will improve and maintain security of supply requirements set in the legislation. In summer 2021 amendments to the Finnish Electricity Market Act were made and in addition to the earlier security of supply requirements, legislation now includes requirements for DSOs to do investments in cost-effective ways and to consider possibilities of using flexibility services instead of grid investments. The first new type NDPs were delivered to the Energy Authority by 30<sup>th</sup> of June 2022.

The Energy Authority has powers to request DSOs to make amendments to their NDPs if deemed necessary. According to the submitted NDPs, DSOs have planned to make replacement investments to the electricity distribution grids during period of 2014 - 2036 worth about EUR 13.3 billion.

#### **Smart grid development**

In September 2016, the Ministry of Economic Affairs and Employment established the Smart Grid Working Group to explore smart grids' potential for the electricity market. Its goal was to explore and propose concrete measures through which smart grids can facilitate the ability of customers to actively participate in the electricity market and generally promote the maintenance of security of supply. The final report with proposals was published in October 2018<sup>5</sup>.

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<sup>4</sup> [https://ec.europa.eu/energy/sites/ener/files/c\\_2019\\_7772\\_1\\_annex.pdf](https://ec.europa.eu/energy/sites/ener/files/c_2019_7772_1_annex.pdf)

<sup>5</sup> Final report is available from <https://tem.fi/en/working-group-to-explore-smart-grids-potential-for-the-electricity-market>

### 3.1.3 Network tariffs

#### **Regulation of network tariffs and charges**

Transmission and distribution system operators set the actual network tariffs and charges by themselves. There is no ex-ante approval of tariffs or prices of network services by the Energy Authority nor any other authorities. However, according to the electricity market legislation the allowed maximum price increase of distribution and transmission network charges within a rolling twelve-month period is limited to 8 percent. Transmission and distribution system operators shall notice their customers about the changes in network charges at least one month prior to entering force.

The Energy Authority confirms ex-ante the methodology to be used in setting both transmission and distribution network tariffs and connection charges. The Energy Authority shall also approve ex-ante the terms and conditions of transmission and connection services before the network operators apply them.

The methodology of setting transmission and distribution network tariffs is confirmed by the Energy Authority prior to each regulatory period. The length of regulatory periods is four years, though the methodology is set for two consecutive regulatory periods. In November 2015, the Energy Authority confirmed with its decisions the methods concerning the rate of return in electricity network operation to be followed during the fourth and fifth regulatory periods in 2016 – 2019 and 2020 – 2023.

After the end of the regulatory period, the Energy Authority confirms the earnings of each network operator for the regulatory period and the amount that exceeds or falls short of the reasonable earnings level for the regulatory period. Where necessary, the supervision decisions include obligations to return any surplus profit from the completed regulatory period to customers through lower network charges during the new regulatory period. Conversely, the supervision decisions also confirm the cases where the network operator can increase earnings via higher network charges during the new regulatory period, equal to the amount by which the actual earnings from the previous regulatory period fell below the reasonable earnings level.

The network is valued in net present value instead of book value in the regulated asset base. Ever since the first regulatory period, the Energy Authority has incentivised system operators to make investments in the electricity network at economically sensible pace, taking into account the technical lifetime of the assets. In the regulation model, all investments in the network are updated into the regulated asset base annually, which is then used to determine the reasonable rate of return. Thus, the confirmed methodology allows necessary network investments to be carried out in a manner which ensures the viability of the networks as required by the Article 59(7)(a). Prior to 2016, the unit prices for all components that formed the regulated asset base were updated for each regulatory period. From 2016, the updates were planned to be made every two regulatory periods, however, the prices were most recently updated in 2021, and came into effect in 2022, as part of a wider set of amendments made to the regulatory methodology in 2021.

Approved rate of return on capital is determined using a WACC-model (Weighted Average Cost of Capital). Most of the WACC parameters are fixed for the methodology period (two regulatory periods) except the risk-free rate which is updated annually and the risk premium of debt which is currently updated for each regulatory period. The methodology for calculating the risk-free rate was amended in 2021 in a way that takes a shorter-term view of the risk-free rate rather than averaging over a 10-year period. The network operators have been encouraged to increase the efficiency of their operations and to maintain a high security of electricity supply. The Energy Authority has set both the general efficiency target and the company-specific efficiency target for the DSOs. The company-specific efficiency targets are estimated on the benchmarking of

DSOs by using semi - nonparametric StoNED-method (*Stochastic Nonsmooth Envelopment of Data*). The efficiency frontier was estimated in 2019 for the fifth regulation period.

The Energy Authority has also developed details of the methodology with a view to achieve a regulatory model that is incentivizing more innovation and investment in the networks in order to ensure viability of the networks.

The Electricity Market Act has detailed provisions related to network charges collected from electricity generation. The connection fees for small-scale electricity generation (maximum 2 MVA) may not include the costs caused by strengthening the existing electricity network but only include the direct costs of connection.

The regulation also sets the maximum level of the network charges for the electricity generation connected to the distribution network. The annual network charges collected from an electricity generator may not exceed 0.07 cent/kWh.

According to the Electricity Market Act, at the request of the customer (either generator or load), the transmission and distribution system operators shall provide a comprehensive and sufficiently detailed estimate on the costs of a new connection.

### **Significant amendments to the electricity market legislation in 2022**

As a result of amendments to the Electricity Market Act which came into force on 1 August 2021, the Energy Authority amended the regulation methodology with changes that came into force from the beginning of 2022. There were three key changes:

- the unit prices of network components, which are used to determine the net present value of the network, were updated and as a result a correction was made to the way prices are adjusted for inflation, to align the methodology with the new schedule based on which component prices are updated periodically
- the already described methodology change to the calculation of the risk-free rate in determining the WACC
- removal of the security of the supply incentive from the methodology, to reflect the fact that the security of supply target date was extended by legislation from 2028 to 2036

In 2019, Energy Authority established a Smart Grid Forum to support national implementation of smart grid provisions of the Clean Energy Package and proposals from Smart Grid Working Group which was set by the Ministry of Economic Affairs and Employment and submitted its final report in Autumn 2018. The Smart Grid Forum consisted of representatives from the Ministry, the Competition and Consumer Authority and relevant stakeholder organisations representing consumers and electricity companies. Based on discussions at the Smart Grid Forum, the Energy Authority prepared and submitted in September 2021 to the Ministry recommendations to harmonise structures of network tariffs at electricity distribution grids.<sup>6</sup>

### **Evolution of network tariffs and levies**

The average distribution network charges fell slightly in 2022. In January 2023, the average distribution network charges (including taxes) for typical household customers were 1.0 to 1.2 percent lower than in January 2022.

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<sup>6</sup> <https://energiavirasto.fi/-/suositukset-sahkon-verkkopalvelumaksujen-harmonisoinnista> (in finnish)

### **3.1.4 Security and reliability regulation**

#### **Network security and reliability rules**

Since September 2013, the national legislation has included obligations for DSOs to plan and develop their network that weather related (like storms or snow) interruptions shall not be longer than 6 hours in zoned areas and 36 hours outside zoned areas.

These demands are coming into force gradually by the end of 2028 and by the end of 2019 half of all customers electricity supply should have met the demands. According to the amendments made in 2021 to the Electricity Market Act, all DSOs operating mainly outside of zoned areas and doing significant investments in the network in the 2020's to fulfil the obligations, are automatically granted time to fulfil the requirements until end of 2036.

Each DSO shall prepare a network development plan to meet these requirements and send an updated plan to the Energy Authority for a review bi-annually. Energy Authority has been monitoring DSO's progress in this task bi-annually since 2014 through DSO's network development plans.

### **3.1.5 Monitoring balance of supply and demand**

#### **Balance of supply and demand**

Based on information submitted by power plant operators to the Energy Authority, total installed power generation capacity in Finland was about 20,000 MW at the end of 2022. However, the entire capacity is not available during the peak load periods. The Energy Authority has estimated in autumn 2022, that 11,300 MW of Finnish electricity generation capacity will be available during the consumption peaks in winter 2022–2023. The Energy Authority estimated also that peak load will be 14,400 MW for the same period, which however turned out to be over 2,000 MW smaller due to milder weather during the winter period 2022-2023 and increased energy savings by electricity customers. The domestic electricity production capacity is not sufficient to cover the consumption during peak load periods, and thus electricity imports from neighbouring countries is needed.

The highest hourly load of the year 2022, 13,767 MWh/h was reached in January. The electricity import capacity was around 5,100 MW until May 2022, and around 3,700 since May 2022 when electricity import from Russia was suspended. During the peak load hour net import was 2,552 MWh/h.

#### **Investments in generation capacity**

In 2022, almost all investments in generation capacity were wind power, leading to more than 1,600 MW increase of installed wind power capacity.

The most significant power generation investment project recently in Finland was the construction of nuclear power plant unit Olkiluoto 3. Building of this 1,600 MW unit was delayed for several years. Originally, the unit should have been commissioned by the end of 2009. The power plant started the regular power production in April 2023.

Fennovoima Oy was planning to construct a new Hanhikivi 1 nuclear power plant unit in Pyhäjoki and the project received a decision-in-principle from the Finnish Government and the Parliament in 2014. In early May 2022, Fennovoima announced that it had terminated the contract of plant

delivery and later in May 2022 Fennovoima announced that it has withdrawn the Hanhikivi nuclear power plant Construction License Application.<sup>7</sup>

Wind power capacity will continue to increase in the coming years. In March 2023, total installed wind power capacity was 5,700 MW and Fingrid has estimated that the wind power capacity will quadruple during the next decade. Seven wind power projects will receive public support, based on the results of technology neutral RES auction organized by the Energy Authority in 2018. However, majority of new wind power projects are being developed without any public support.

At the end of 2022, more than 600 MW of solar power capacity was connected to the grid. This consists mainly of small-scale solar panels (capacity less than 1 MVA); only total capacity of 34 MW is from solar power plants with capacity above 1 MVA. Annual increase of solar power capacity was more than 200 MW.

A part of old CHP capacity has been decommissioned and replaced by heat-only production. Due to low profitability of electricity production, these kinds of investments may become more common in the coming years. Heat production will also be more and more based on heat pumps, which will increase electricity consumption.

On 1 April 2019 came into force a new Act which forbids the use of coal in electricity and heat production from 1 May 2029. However, use of coal will be allowed after 1 May 2029 to ensure security of supply in heat production subject to the Energy Authority's approval. Furthermore, the Government may allow use of coal for an interim period under crisis. However, use of coal in energy production has already been decreasing also because of economic reasons.

### **Interconnector capacity**

No new investments in interconnection capacity have been made since the Estlink 2 between Finland and Estonia started operation in 2014. When Olkiluoto 3 nuclear power plant is operating in full capacity, Fingrid will reduce available interconnector capacity from the Northern Sweden to Finland by 300 MW.

Third AC connection between Finland and Sweden, Aurora Line, is scheduled to be in operation in 2025. It will increase interconnection capacity from Finland to Sweden (SE1) with 900 MW and from Sweden to Finland with 800 MW. European Union has granted EUR 127 million in support for the Aurora line.

Fingrid and Svenska Kraftnät have agreed in 2021 to continue operation of Fennoskan 1 HVDC-connector between Finland and Sweden until 2040.

### **Strategic reserves**

To ensure the balance between supply and demand during scarcity hours, Finland has a capacity mechanism – strategic reserve. The Energy Authority is responsible for evaluating and deciding the required size of the strategic reserve capacity and arranging the tendering process to procure the capacity.

During the winter period, from December to end of February, units participating in the strategic reserve system are in 12 hours' readiness to start electricity production. At other times, the units are in one-month readiness. The units shall be able to increase power output with 1 MW within 1 minutes after request and be ready for 200 hours continuous power production with full capacity during the winter period.

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<sup>7</sup> <https://www.fennovoima.fi/en/press-releases/fennovoima-has-withdrawn-hanhikivi-1-construction-license-application-focus-now>

In summer 2022 the Energy Authority organized a tender for strategic reserve capacity for period from 1<sup>st</sup> of November 2022 to 31<sup>st</sup> of October 2023. This was the first tender under the new EU rules for capacity mechanisms, and the target capacity was 600 MW which was seen necessary to meet the reliability standard (LOLE=2.1 hour/year) adopted by the Finnish Government in spring 2022. However, the Energy Authority didn't acquire any capacity for the peak load reserve as the only received bid was rejected because did not fulfil the requirements set in the national legislation.

Activation of strategic reserve capacity has been very rare. The last time strategic reserves were activated was during the winter 2009 – 2010.

### **Risk-preparedness for crisis in electricity sector**

Being designated as the competent national authority defined in the Risk-preparedness Regulation (2019/941) in September 2020, the Energy Authority together with relevant stakeholders defined in 2021 national crisis scenarios in electricity sector and prepared the national Risk Preparedness Plan. The plan was submitted to the Commission and to the Electricity Coordination Group in December 2021. The Commission provided its opinion on the Risk Preparedness Plan in June 2022 and the Energy Authority updated the plan according to the opinion.

### **3.1.6 Cross-border issues**

#### **Technical cooperation between Union and third country transmission system operators**

The electricity trading with Russia has been suspended since May 2022.

There was 1,300 MW of transmission capacity from Russia to Finland available to the electricity market. Additionally, Fingrid had reserved a volume of 100 MW to be used as a power system reserve. The maximum trading capacity from Finland to Russia was 320 MW.

#### **Capacity allocation and congestion management**

Congestions in interconnectors between Finland and Sweden, Finland and Norway and Finland and Estonia are managed by implicit auctions in the day-ahead market.

Capacity of submarine cable between Åland Island and mainland of Finland, Ål-Link, is not provided to the market. This cable is built to ensure security of supply in Åland islands which have an AC-cable connection to Sweden.

The day-ahead interconnector capacities for the next day are announced before noon and the intraday capacities in the afternoon. The principles for determining the transfer capacities in the Nordic power market and margins are described in the System Operation Agreement between the Nordic TSOs which is a part of the Nordic Grid Code. In the present system transfer capacity provided to the market is Net Transfer Capacity (NTC) which is Total Transfer Capacity (TTC) subtracted with Transmission Reliability Margin (TRM). TRM is 100 MW in AC interconnectors between FI and SE1 bidding zones and zero in Fennoskan HVDC links between FI and SE3 bidding zones.

In July 2018, all regulatory Authorities of CCR Nordic approved TSOs' Proposal for a Capacity Calculation Methodology in accordance with Article 20(2) of the CACM Guideline. According to the proposal, flow-based (FB) method will be used as capacity calculation method for day-ahead

and intraday markets. In October 2020, all regulatory Authorities of CCR Nordic agreed to approve the amended day-ahead/intraday capacity calculation methodology.<sup>8</sup>

The flow-based method has not been implemented yet. Nordic TSOs started the external parallel runs. The flow-based methodology can be used for capacity calculation earliest in spring 2024.

Table 2 shows the costs of the countertrade paid by Fingrid and congestion income to Fingrid during the years 2019 - 2022.

**Table 2. Net costs of countertrade and congestion income.**

	2019	2020	2021	2022
<b>Net costs of countertrade, MEUR</b>	<b>0.9</b>	<b>0.7</b>	<b>2.5</b>	<b>7.3</b>
• Countertrade between Finland and Sweden, MEUR	0.1	0.1	0.3	3.8
• Countertrade between Finland and Estonia, MEUR	0.5	0.2	0.2	1.7
• Countertrade inside Finland, MEUR	0.3	0.4	2.0	1.8
<b>Congestion management income to Fingrid, MEUR</b>	<b>73.0</b>	<b>146.7</b>	<b>283.8</b>	<b>943.0</b>
• From interconnectors between Finland and Sweden, MEUR	65.5	122.7	221.1	775,6
• From interconnectors between Finland and Estonia, MEUR	7.5	24.1	62.8	167.4

Finland is considered as a single bidding zone and congestions within Finland and after day-ahead market closure are managed by countertrade. Countertrade is used to relieve both national and inter-regional congestions during the daily network operation. Costs of countertrade are paid by the TSO.

In 2022 congestion management income for the Fingrid totalled EUR 943 million (EUR 284 million in 2021). Fingrid uses congestion income to investments that aim to relieve the congestions. Fingrid used EUR 368 million of congestion incomes in 2022. A part of congestion income was used for financing transmission grid investments, and majority was added to the company's turnover to the benefit of customers. Fingrid did not charge grid service fees in December 2022 and January and February 2023. At the end of the year 2022, Fingrid had EUR 1,063.7 million of unused congestion income, which will be used later for financing investments to improve the market functioning.

### 3.1.7 Implementation of Network Codes and guidelines

#### **System Operation Guideline (SO GL)**

In 2022, the Energy Authority continued to co-operate with Nordic TSOs and NRAs to meet System operation guideline (2017/1485) requirements on Nordic and national levels. Before approval of some proposals, there have been preparatory actions on next matters ramping restrictions and FRR exchange and sharing limits between SAs. The Energy Authority have taken coordinated actions to meet Guideline requirements and to ensure that Guideline objectives can be met.

<sup>8</sup> <https://energiavirasto.fi/documents/11120570/12872579/P%C3%A4%C3%A4t%C3%B6s+Nordic+kapasiteetin+laskenta-alueen+kapasiteetin+laskentamenetelm%C3%A4n+muuttamisesta.pdf/ea9b8c31-cf41-4d32-b902-571e43fad02c/P%C3%A4%C3%A4t%C3%B6s+Nordic+kapasiteetin+laskenta-alueen+kapasiteetin+laskentamenetelm%C3%A4n+muuttamisesta.pdf?t=1603785321857> (in Finnish)

In March 2021, the Energy Authority received among all the other Nordic NRAs from Nordic TSOs a proposal on amended ramping methodology in accordance with SO GL art 137 (3)(4). The proposal main content was to include North Sea Link ja Kriegers-Flak HVDC links to the scope of existing proposal. In October 2021 Nordic NRAs submitted a request for amendment concerning most of the minor details but also the major reason was that Nordic TSOs informed Nordic NRAs in September 2021 that proposed ramping restrictions is not possible to implement according to proposed implementation timelines. In December 2021 Nordic TSOs submitted an amended proposal to Nordic NRAs. Content of resubmission was to include partial implementation to methodology where first part of methodology is valid after the national NRAs' decisions and the second part valid when virtual bidding zone (NO2) is technically implemented on intraday trading system. Neither Nordic NRAs' agreement nor national decisions were made by the end of 2021.

During the year 2021, several meetings were held between Nordic TSOs and NRAs to map needs for amending FRR dimensioning methodology. As a result, TSOs concluded the necessary changes to the methodology could be implemented by updating the system operation agreement (SOA). By the end of 2021, any formal proposal wasn't submitted to Nordic NRAs for approval.

In 2021, TSOs developed new technical features as well as dimensioning rules in the FCR methodologies. In June 2021, the Nordic TSOs informed the NRAs about challenges in obtaining the required FCR-D down capacity through market-based measures. TSOs presented a plan to procure more reserve capacity and assured that, despite the challenges, system security will be kept at an acceptable level due to inherent properties of the production units. This subject was closely discussed and followed up in the cooperation group of the TSOs and the NRAs.

These discussions continued during 2022 when Nordic TSOs submitted three methodologies for Nordic NRAs approval: FRR dimensioning rules in accordance with Article 157(1), dimensioning rules for FCR in accordance with Article 153 and additional properties of the FCR in accordance with Article 154(2). In December 2022, after assessing the proposals, the NRAs submitted request for amendment for all three methodology proposals. Additionally, TSOs indicated another upcoming proposals to be submitted for approval during 2023: methodology to determine limits on the amount of exchange of FRR/RR between synchronous areas defined in accordance with Article 176(1)/178(1) and to determine limits on the amount of sharing of FRR/RR between synchronous areas defined in accordance with Article 177(1)/179(1) and methodology for ramping restrictions for active power output in accordance with Article 137(3) and (4).

### **Emergency and Restoration Network Code (ER NC)**

By 2021, the Energy Authority has approved all proposals related to the ER NC.

Among the approved proposals was a proposal on the rules for suspension and restoration of market activities in accordance with network code on Emergency and Restoration. According to these rules Fingrid shall not suspend market activities pursuant to the relevant article of the network code as activities listed for possible suspension in the network are either not relevant to be suspended in an emergency situation as suspension would not help handling of the situation or Fingrid has otherwise adequate tools to better cope with situation such as reducing the cross-zonal capacities on the Finnish bidding zone borders if needed for operational security reasons rather than suspending the provision of cross zonal capacity for capacity allocation altogether.

In 2021 Fingrid updated already approved proposals concerning significant grid users and test plan according to (EU) 2017/2196 article 4.2(c and g) and submitted them for approval. These new proposals were approved in the first half of 2022. No new proposals regarding ER NC have been sent for approval in 2022.

### **Forward Capacity Allocation Guideline (FCA GL)**

The assessment in line with Article 30(4) of the FCA guideline revealed that the hedging opportunities in the Estonian bidding zone were no longer insufficient. This was largely due to the fact that previously the Estonian market participants had used the Helsinki EPAD as their main hedging tool due to the low liquidity of the Tallinn EPAD. The changes in the markets resulted in decreased correlation between the Finnish and Estonian bidding zones, making it impossible for the Estonian market participants to acquire a sufficient hedge using the Helsinki EPAD. The Finnish and Estonian NRAs came to the conclusion that the hedging opportunities were insufficient and agreed to request the Finnish and Estonian TSOs to issue transmission rights on the FI-EE -border.

The Energy Authority has assessed, in spring 2021, the Finnish bidding zone and concluded that there are not sufficient hedging opportunities available in the electricity forward markets. However, the Finnish and Swedish NRAs were unable to agree on the decision in line with article 30 of the FCA Guideline. Due to this, ACER adopted a decision under Article 30(5)(b) of the FCA Guideline concerning the FI-SE1 and FI-SE3 bidding zone borders in September 2022. A joint proposal from Finnish and Swedish TSOs on improving hedging opportunities is expected in 2023.

### **Capacity Allocation & Congestion Management Guideline (CACM GL)**

The Energy Authority discussed with other NRAs on the CACM GL cost reporting and continued its national cost decision processes throughout year 2022 and actively participated other CACM processes discussed and handled in the CACM TF.

The capacity calculation methodology in Nordic Capacity Calculation region (CCR) in line with article 20 of CACM (CCM -methodology) was already approved in July 2018. The Nordic NRAs, however had agreed to request for an amendment to clarify some parts of the methodology by requesting changes to the methodology in December 2018. The Nordic TSOs thus sent a proposal for amendments on the capacity calculation method in June 2019. Amendments to the capacity calculation method were approved by the NRAs of the Nordic CCR October 2019.

In April 2020 the Nordic CCR TSOs sent a new proposal for amendment of the CCM, following ACER's decision on the long-term capacity calculation methodology for the same region. The Nordic CCR NRAs considered the proposal to be for the most part in line with the regulation but found need to specify the implementation plan more precisely in order to ensure proper parallel runs and sufficient functionality before starting to use the new flow-based calculation. Energy Authority and the other Nordic CCR NRAs approved the methodology with some additions on in October 2020. At the same time, the NRAs also agreed to add a checkpoint to the implementation process 6 months after the start of parallel runs. During this checkpoint, the relevant NRAs will assess the functionality of the methodology of the operational implementation of the flow-based capacity calculation method based on the TSOs' report which builds on experience from the parallel runs. After the checkpoint and provided that the TSOs are operating at a sufficient level, the TSOs shall run the parallel runs for another 6 months before go-live. The Nordic TSOs plan to begin the parallel runs in accordance with the approved methodology and art. 20(8) of the CACM Guideline in early 2022. As the approved methodology requires a minimum of 12 months of parallel runs, flow-based capacity calculation could be taken into use in the Nordic CCR earliest in spring 2023. During 2022, the TSOs faced several issues regarding the setup of parallel runs, resulting delay in planned timeline stated above. Towards the end of 2022, the TSOs started the runs in parallel and were continuously reporting the relevant development of the runs to the NRAs. At this point, runs were not part of the official 12-month parallel run but preparative actions for that. Following from above mentioned, as the approved methodology requires a minimum of 12 months of parallel runs, flow-based capacity calculation could be taken into use in the Nordic CCR earliest in first half of 2024.

## **Electricity Balancing Guideline (EB GL)**

In 2022, Energy Authority have participated together with other European NRAs and ACER in the common European decision-making processes to approve methodologies pursuant to the EB GL. Also, Energy Authority has followed Nordic TSOs co-operation project NBM (Nordic balancing model) which is closely related to EB GL implementation. Before approval, some proposals, there have been preparatory actions on several balancing methodologies. The Energy Authority have taken coordinated actions to meet Guideline requirements and to ensure that Guideline objectives can be met.

In March 2018, all Nordic TSOs signed a Cooperation Agreement on an initiative of the Nordic Balancing Model (NBM) to update and adapt the balancing market design, develop methods and operational processes as well as related IT systems to ensure an efficient and secure balancing scheme compliant with the European network codes. The NBM initiative will be based on the introduction of modernized Area Control Error (mACE) in the Nordic LFC Block where instantaneous power imbalance will be set to zero for each sub region (bidding zone) separately instead of present system where imbalance will be set for whole Nordic synchronous area.

The NBM project covers almost the entire area of electric balancing market development in the Nordic region. Some of the development projects also extend to the area of system operation or are national development projects. The project includes several steps aiming at Nordic TSOs' connection to European mFRR market platform (MARI) and European aFRR market platform (PICASSO).

The EBGL requires that by 18 December 2020 all TSOs shall apply the imbalance settlement period of 15 minutes in all scheduling areas while ensuring that all boundaries of market time unit shall coincide with boundaries of the imbalance settlement period. The regulation allows that the national regulatory authority may, at the request of the TSO or at its own initiative, grant the relevant TSOs a derogation from this obligation until 1 January 2025.

In October 2018, the Energy Authority published after analysis and consultation with neighbouring Estonian and Nordic NRAs a statement in which the Energy Authority did not find reasons for such derogation in Finland. In December 2018, all Nordic NRAs published a similar joint statement. In March 2019 Nordic TSOs announced that they have identified risk of delay in the implementation of 15 min imbalance settlement period in the Nordics by December 2020. Fingrid submitted to the Energy Authority in June 2020 a request to approve derogation from the implementation of 15 minutes imbalance settlement until 22 May 2023. In March 2021, the Energy Authority approved the derogation request after coordination with other Nordic NRAs. However, the Energy Authority requested Fingrid to prepare parallel an alternative approach to meet the new implementation date even if there will be any problems with implementation timetable in other Nordic countries. Also, The Energy Authority required Fingrid to submit continuous reports on every six months on national parallel implementation.

In August 2021, the Government adopted updated metering regulation (767/2021), which requires Finnish DSOs to implement 15 minutes energy meter resolution within transition periods. The implementation of measurements at a resolution of 15 minutes is a prerequisite for the national parallel implementation of 15 ISP in Finland. This also allows for a mandatory change, imbalance settlement resolution of 15 minutes in the Nordic imbalance settlement unit eSett.

In October 2020, Fingrid submitted to Energy Authority a request to receive from NRA an informal guidance regarding BRP terms and conditions. The informal guidance was submitted to Fingrid in November 2020. The previous decision (2018) to BRP terms and conditions was two price systems in which up and down adjustments were made into two separate prices. In a single price system, up and down adjustments together affect price formation, and the result is a converging price for up and down adjustments, imbalance price. Single price model combines price formation.

The single price proposals were submitted to Nordic NRAs in December 2020. The proposals did have different scope on each Nordic country and in Finland proposal was consisting of mFRR,

FCR and BRP terms and conditions. Fingrid submitted also separate proposals regarding single price model aFRR in April 2021. The aFRR proposal was divided on two separate sub-proposals regarding firstly single price model and secondly Nordic aFRR market changes.

During the decision-making process, the legality of technical price cap for balancing electricity (EUR 5,000 /MWh) and the even treatment for managing serious disturbances became major issues based on stakeholder statements. The Energy Authority made decision regarding single price model (mFRR, FCR and BRB terms and conditions) in September 2021. Energy Authority considered that the proposed balancing electricity price cap (EUR 5,000 /MWh) did not fulfil existing regulation and thus was removed, and 12 months was given to Fingrid to make technical changes for necessary actions. Also, 12 months was given to resubmit a reformed proposal regarding even treatment in the management of serious disturbances. Fingrid made proposal for price limit of EUR 10,000/MWh which Energy Authority approved in September 2022 as it will not limit the price formation in the wholesale markets.

In December 2021 Fingrid submitted a proposal concerning Nordic mFRR EAM. Proposal was consisting of mFRR terms and conditions. In 2022, Fingrid withdrew the proposal due to delays in the NBM project.

Overall, the planned timelines of the NBM project were extended in 2022. The Energy Authority issued decisions to grant derogation to extend the latest date for Fingrid to join MARI and PI-CASSO platforms. The derogated timeline for joining the platforms is by July 2024.

### **Demand Connection Code (DCC NC)**

Fingrid has prepared requirements for demand connections (KJV2018) based on the DCC NC. Fingrid submitted draft requirements to Energy Authority for approval in September 2018. Energy Authority has approved the requirements after amendments in March 2019.

### **Requirements for Generators (RfG NC)**

Fingrid has prepared requirements for generators (VJV2018) based on the RfG NC. Fingrid submitted draft requirements to Energy Authority for approval in May 2018. Energy Authority has approved the requirements after amendments in December 2018.

### **High Voltage Direct Current Connections (HVDC NC)**

Fingrid has prepared requirements for HVDC connections which will be connected to the Finnish electricity system based the HVDC NC. Fingrid submitted draft requirements to Energy Authority for approval in November 2018. Energy Authority has approved the requirements for HVDC connections in May 2019.

## **3.1.8 Monitoring and assessing the development of a smart grid**

Energy Authority must monitor and assess the development of smart grid and how the actions improve energy efficiency and the integration of energy from renewable sources. Also, Energy Authority must assess the network development, investments to the network and are the DSOs using demand response, energy efficiency, energy storage facilities or other resources as an alternative to system expansion.

Since August 2021, the national legislation has included obligations for DSOs to include in the distribution network development plans a plan for using demand response, energy efficiency,

energy storage facilities or other resources as an alternative to system expansion. Distribution network development plans including the new obligation were delivered to the Energy Authority first time in June 2022.

Based on distribution network development plans the DSOs have invested over 4,6 billion euros in 2014-2021 because of the security of supply obligations. The network development and investments to distribution network because of these obligations will continue to the end of 2036. Demand response and other resources as an alternative to system expansion are still quite new solutions for the DSOs based on the NDPs. Only a small portion of the DSOs have done research or pilot projects to develop these alternative solutions. In the 2024 distribution network development plans the DSOs must describe in more detail how they are going to utilize alternative resources in their distribution network. The Energy Authority also encourages the DSOs to research and pilot new potential alternatives to system expansion and because of that for the upcoming regulatory period beginning in 2024 it is planned to have a separate incentive for flexibility.

In addition to the obligation of monitoring and assessing the development of smart grid, Energy Authority also strongly incentivises DSOs and TSO to innovate self-imposed. DSOs and TSO have a possibility to include a cost equalling 1 per cent of their yearly network business related turnover to a specific innovation incentive as a part of Energy Authority's regulatory method. Since DSOs and TSO are required to publish the results of their finished innovative projects, it creates Energy Authority a possibility to consider number of published Smart Grid projects as an output suitable for also Smart Grid Indicators<sup>9</sup>. Therefore, Energy Authority reports the number of published Smart Grid projects here as a part of National Report 2022.

To be considered as a Smart Grid project according to Energy Authority the project must address at least one of the following categories:

- smart metering
- demand flexibility
- flexibility solutions
- batteries, storages, EVs

During year 2022 DSOs and TSO reported total of 17 innovative projects which Energy Authority classified as Smart Grid projects. Two of the total 17 projects were carried out by the TSO and the rest were projects by DSOs. A few projects are collaborative projects between several DSOs, but Energy Authority has calculated projects if they were individual projects since every DSO must bear their own project costs.

As stated above the upcoming regulatory period is planned to have a separate incentive for flexibility. Up to beginning of the new regulatory period network operators are able to report different flexibility solutions as a part of innovative incentive. Energy Authority expects the amount of flexibility solutions to increase due to the new incentive for flexibility.

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<sup>9</sup> The Expert Workshop on Defining Common Smart Grid Indicators (i.e. Smart Grid KPIs) has concluded that Smart Grid Indicators should include a limited sets of output indicators, supported by inputs indicators. The workshop was co-organised by DG ENER, CEER and ACER, Organised virtually on 25<sup>th</sup> May, 2022, including national regulators, network operators (ENTSO-E and EU.DSO, and energy stakeholders (T&D Europe, SmartEn).

## 3.2 Competition and market functioning

### 3.2.1 Wholesale markets

Some key indicators for illustrating the development wholesale market are shown in the following table (Table 3).

**Table 3. Indicators for electricity wholesale market**

Electricity wholesale market indicators	2019	2020	2021	2022
<b>Electricity Production (TWh)</b>	<b>66.1</b>	<b>66.1</b>	<b>69.0</b>	<b>69.2</b>
• Hydro power	12.3	15.6	15.4	13.4
• Wind power	6.0	8.0	8.1	11.6
• Solar power	0.2	0.3	0.3	0.4
• Nuclear Power	22.9	22.4	22.6	24.2
• CHP district heating	12.4	9.6	10.3	8.6
• CHP industry	9.6	8.1	9.0	7.3
• Conventional thermal power	2.6	2.2	3.1	3.7
<b>Total annual electricity demand (TWh)</b>	<b>86.1</b>	<b>81.1</b>	<b>86.8</b>	<b>81.7</b>
• Maximum hourly demand (GWh/h)	14.54	12.39	14.27	13.74
<b>Imports volume (TWh)</b>	<b>23.9</b>	<b>21.6</b>	<b>24.5</b>	<b>19.4</b>
<b>Exports volume (TWh)</b>	<b>3.9</b>	<b>6.7</b>	<b>6.7</b>	<b>6.9</b>
<b>Traded volume in the spot electricity market (TWh)</b>				
• Day-ahead buy volume (FI)	63.2	59.0	62.8	59.6
• Day-ahead sell volume (FI)	50.1	45.2	52.3	48.3
• Intraday buy volume (FI)	1.0	1.0	1.1	1.3
• Intraday sell volume (FI)	1.0	1.0	1.1	1.4
<b>Average day ahead markets electricity price in Finnish bidding zone (EUR/MWh)</b>	<b>44.04</b>	<b>28.02</b>	<b>72.34</b>	<b>154.04</b>
<b>Generation fuel mix by source (GW)</b>				
• Coal	1.6	1.4	1.4	1.4
• Gas	1.8	1.8	1.8	1.8
• Petroleum	1.3	1.3	1.3	1.3
• Nuclear	2.8	2.8	2.8	2.8
• Peat	1.8	1.5	1.3	1.3
• Biofuels	2.6	2.7	2.6	2.6
• Waste	0.2	0.2	0.2	0.2
• Hydro	3.2	3.2	3.2	3.2
• Wind	2.2	2.4	3.2	4.8
• Solar	0.2	0.3	0.4	0.6
<b>Total installed generation capacity (GW)</b>	<b>17.7</b>	<b>17.6</b>	<b>18.2</b>	<b>20.0</b>
• Maximum hourly generation (GWh/h)	11.20	10.56	11.41	12.53

### Market opening

In the Nordic and Baltic electricity market electricity trading takes the form of bilateral trade – i.e. direct trading among the market actors – and trading via the power exchange.

The Energy Authority has designated in December 2015 for four years period Nord Pool AS to perform day-ahead and intraday coupling in Finland as a nominated electricity market operator (NEMO). European Market Coupling Operator ASA (EMCO/former Nord Pool) applied in 2019 for re-designation of their nominated market coupling operator status in accordance with article 4 of CACM. Energy Authority re-designated EMCO for indefinite period in December 2019 with obligations to inform relevant changes to Energy Authority.

In January 2016, EPEX SPOT SE announced to the Energy Authority its willingness to offer day-ahead and intraday trading services with delivery in Finland by using so-called passport method. The Energy Authority decided in February 2016 that EPEX SPOT SE has right to offer day-ahead and intraday trading services with delivery in Finland.

In January 2019, after being designated as a NEMO in Sweden, Nasdaq Oslo ASA announced to the Energy Authority its willingness to offer day-ahead trading services with delivery in Finland by using so-called passport method. The Energy Authority decided in March 2019 that Nasdaq Oslo ASA has right to offer day-ahead trading services with delivery in Finland.

In January 2022, after being designated as a NEMO in Sweden, Nasdaq Spot AB announced to the Energy Authority its willingness to offer day-ahead trading services with delivery in Finland by using so-called passport method. The Energy Authority decided in March 2022 that Nasdaq Spot AB has right to offer day-ahead trading services with delivery in Finland.

In April 2017, the Energy Authority approved in cooperation with other Nordic regulatory authorities a plan for multi-NEMO arrangements (MNA) proposed by Fingrid. This enables multiple NEMOs to offer day-ahead and intraday trading services in Finland.

EPEX SPOT SE launched in Finland their intraday continuous trading and clearing services on 25 May 2020 and started offering day-ahead trading services on 3 June 2020. Nasdaq Oslo ASA and Nasdaq Spot AB have not yet started offering day-ahead trading services in Finland.

Finland has been part of the European Cross-Border Intraday (XBID) solution since the 1<sup>st</sup> wave of XBID go-live in June 2018. XBID allows for orders entered by market participants for continuous matching in one bidding zone to be matched by orders similarly submitted by market participants in any other bidding zone within the XBID solution's reach, as long as transmission capacity is available.

The share of electricity bought from the power exchange in relation to the Finnish electricity consumption has increased considerably since Finland joined the Nordic power market area in June 1998. The share of electricity procured from Nord Pool power exchange covered 74 per cent of the Finnish physical consumption in 2022. Electricity procurement from EPEX SPOT was considerably lower, and it covered 5 per cent of Finnish electricity consumption in 2022.

In addition, Nasdaq OMX has been providing services for trading with financial products in an organized marketplace.

## **Prices**

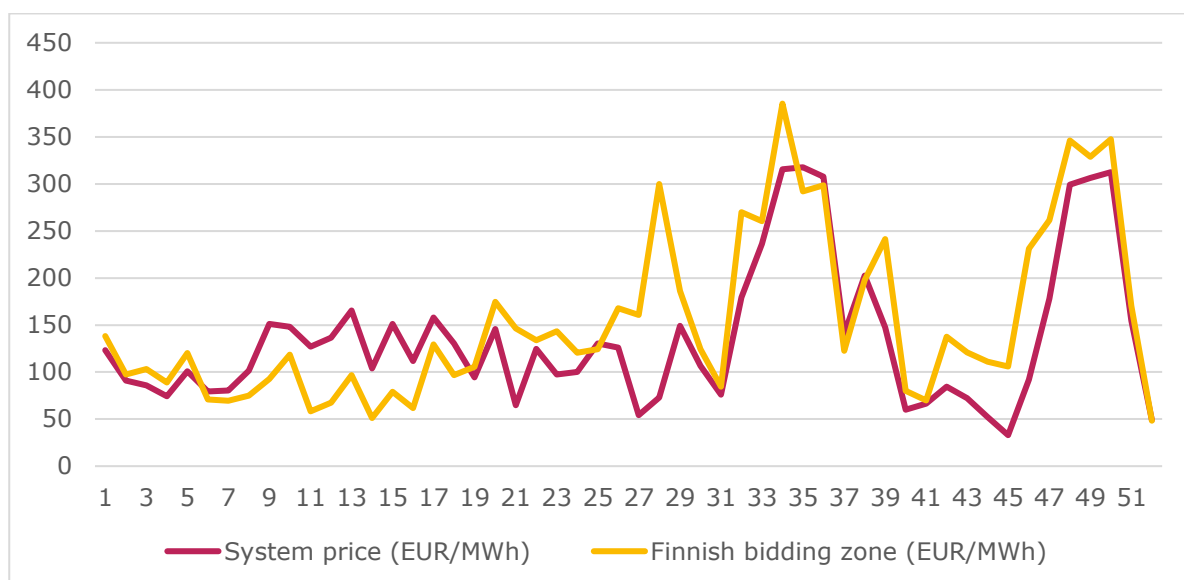
The basis of the price formation in the Nordic power market is the day-ahead spot market. Trade is organised as an implicit auction. The prices are determined by summarising all purchases into a purchase curve and all sales into a sales curve. Bids in the electricity spot market are given in the same way regardless of the player, and accordingly, bids for the following day shall be given before noon every day indicating the amounts one wishes to purchase or sell at the relevant hour at different price levels. When the price has been determined for each operating hour, the sales and purchases of individual players are determined. In case there are no grid restrictions between the Nordic countries or internally in one of countries, the spot price is the common price for the entire Nordic market area.

In Nordic area Nord Pool Spot calculates so-called system price which is an unconstrained market clearing reference price for the Nordic region. It is calculated without any congestion restrictions by setting capacities to infinity. The system price is calculated locally by Nord Pool Spot after area prices are calculated for all bidding areas. Flows between the Nordics and the Netherlands, Germany, Poland and the Baltics from the area price calculation are taken into account in system price calculation. These flows are used when calculating the System price either as import/sales or as export/purchase orders. In system price calculation area bidding areas in Norway, Denmark, Sweden and Finland constitute one common bidding area (capacities between these are set to infinity).<sup>10</sup>

In 2022, the average system market price was 118 per cent higher than in 2021. The average system price in 2022 was EUR 135.86/MWh.

The average Finnish area price in 2022 was EUR 154.04/MWh, showing an increase of 113 per cent year-on-year. The highest hourly day-ahead price EUR 861.14 /MWh in Finnish bidding zone was reached on August 8, 2022.

Figure 1 presents weekly average Nordic system market prices and day-ahead prices in the Finnish bidding zone in 2022.

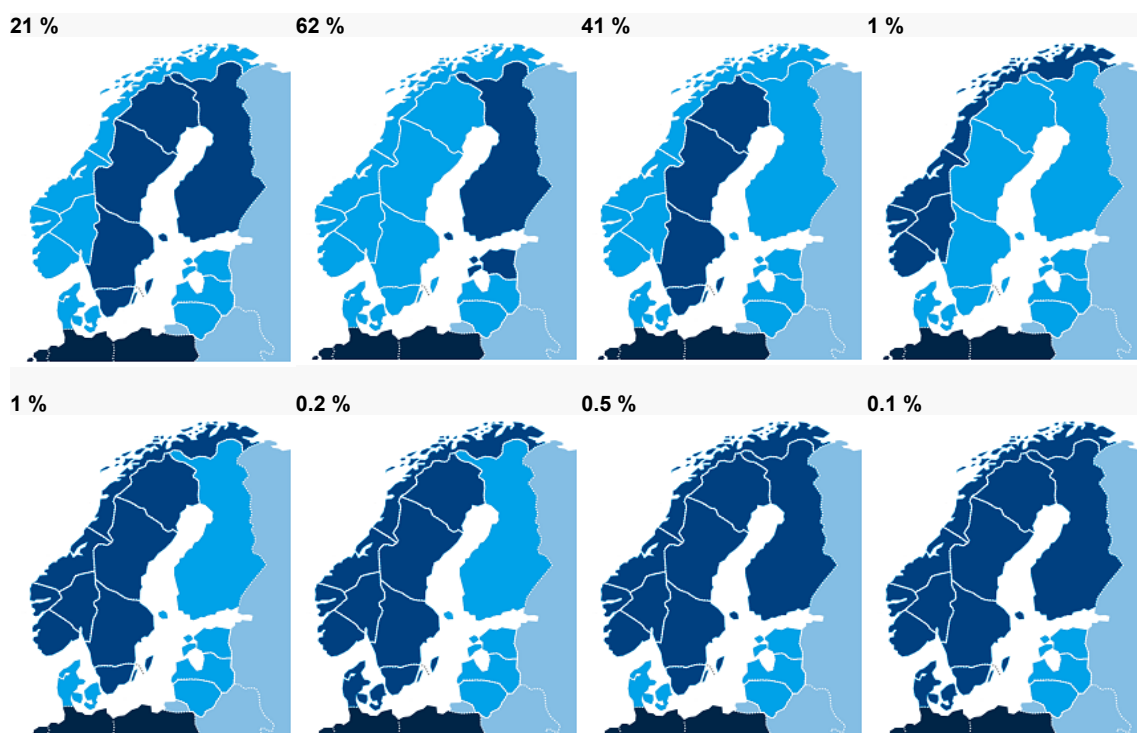


**Figure 1. Weekly average day-ahead market system prices and prices in Finnish bidding zone in 2022. (Source NordPool)**

In 2022, about 25 per cent (in 2021: 39 per cent) of the time Finland and Northern- and Central Sweden (SE1-SE3 bidding zones) had equal day-ahead price. Finland had equal day-ahead price with Estonia 62 per cent (in 2021 60 per cent) of time in 2022.

Figure 2 presents the percentage of hours during the year 2022 when equal day-ahead price existed. In this picture the bidding zones of each country are grouped for clarity.

<sup>10</sup> <https://www.nordpoolgroup.com/trading/Day-ahead-trading/Price-calculation/>



**Figure 2. Percentage of hours during which different bidding zones have had equal day-ahead market prices in 2022**

## **Transparency**

In 2013 came into force transparency regulation (543/2013) which is also followed in Finland. In addition to this, also REMIT regulation (1227/2011) includes obligations for market participants to publish inside information, which if it were made public, would likely to significantly affect the prices of wholesale energy products. In addition to publication of inside information REMIT regulation also sets other obligations to improve energy market transparency.

According to REMIT regulation (1227/2011) it is prohibited to trade on an inside information. This includes, inter alia, acquisition of a wholesale energy market product when market participant holds inside information related to that product, disclosure of inside information to a third party and recommending another person to acquire wholesale energy product based on such inside information. Energy Authority monitors markets and potentially investigates and sanctions market participants when they detect potential breach of REMIT obligations to publish inside information or prohibition of insider trading.

According to REMIT regulation (1227/2011) market participants shall register with the national regulatory authority in the Member State in which they are established or resident of. Energy Authority maintains the national registry of market participants and approves/disapproves new participants, or any changes done to the existing one. Market participants are also obliged to report their wholesale energy market transactions to ACER which in turn discloses these transactions to Energy Authority. Energy Authority monitors markets in relation to the registry of market participants and reported transactions in order to detect whether all relevant parties are within the scope of REMIT.

In Finland, transparency arrangements are based on legislation and authority surveillance. Additionally, there are also voluntary contract-based arrangements between Nord Pool and the market participants trading in Nord Pool.

According to the regulations, producers, consumers and transmission system operators have an obligation to disclosure information on events, which might have a relevant effect to price formation. They shall report on any plans or changes of plans for maintenances or limitations of their production units or interconnectors as well as unplanned outages and failures.

Furthermore, in Finland there are some national rules on disclosure of information related to electricity power plants. According to the Electricity Market Act a power plant operator shall notify the Energy Authority of a plan for constructing a power plant, of commissioning of a power plant and of long-term or permanent decommissioning of a power plant. Further provisions on the contents of the notification obligation and notification procedure are given by Government degree.

Pursuant to the Electricity Market Act, the power plant operator is obliged to notify the Energy Authority of a planned maintenance outage of its power plant practicing separate electricity generation, with an output of 100 MVA, which would take place between the 1st of December and the 28th of February. The notification shall be made at least six months before the planned starting date of the maintenance outage. The Energy Authority may order that the date of a maintenance outage of a power plant be rescheduled outside the period of the 1st of December and the 28th of February.

### 3.2.2 Retail market

Some key indicators for illustrating the development electricity retail market are shown in the following table (Table 4).

**Table 4. Indicators for electricity retail market.**

Electricity retail market indicators	2019	2020	2021	2022
<b>Number of electricity customers (1000)</b>	<b>3,614</b>	<b>3,585</b>	<b>3,600</b>	<b>3,590</b>
• Household customers (1000)	3,148	3,085	3,197	3,170
• Other customers (1000)	467	500	403	417
Number of electricity suppliers	71	63	58	53
Market share of the three largest suppliers by metering points, %	40-45%	45%	41%	48%
Number of retailers with market shares >5%	7	6	6	6
Number of retailers with customer shares > 5%	5	6	6	6
<b>External switching rate, %<sup>11</sup></b>	<b>13.9%</b>	<b>15.5%</b>	<b>16.2%</b>	<b>16.3%</b>
• Households, %	14.3%	15.6%	16.2%	16.6%
• Other customers, %	12.3%	14.7%	17.1%	14.7%
Share of customers having a smart meter, %	>99%	>99%	>99%	>99%
Share of customers having different type of electricity supply contracts (as of 31 December)				
• Fixed-term contract, %	49%	52%	54%	50%
• Open-ended contract, %	40%	40%	37%	36%
• Dynamic price contract, %	11%	8%	9%	14%
HHI in terms of sold energy	725-750	875-900	825-850	800-825
• Households	800-825	875-900	725-750	925-950
• Other customers	750-775	975-1000	800-825	750-775
HHI in terms of metering points	850-875	925-950	800-825	1000-1050
• Households	875-900	950-975	875-900	1050-1100
• Other customers	800-825	825-850	775-800	875-900
<b>Evolution of the price of electricity for a typical household consumer<sup>12</sup>, cent/kWh</b>	<b>18.62</b>	<b>18.64</b>	<b>19.97</b>	<b>26.57*</b>
• Network charges (excl. taxes)	6.18	6.38	6.20	6.26
• Energy costs and supply margin (excl. taxes)	6.58	6.40	7.65	14.56*
• Taxes	5.86	5.86	6.11	5.75*
Number of final household consumers with a network service contract for partial self-generation	21,400	29,900	37,100	61,200

<sup>11</sup> Switching rates might include also switches which are due to mergers of supply companies and treated as supplier switches in data exchange. Thus, the actual supplier switching rate might be a bit lower

<sup>12</sup> Household annual consumption 5000 kWh/year. For 2023 the energy cost is an estimate based on SCF data. Situation as of 31.12

Electricity retail market indicators	2019	2020	2021	2022
<b>Installed capacity of small-scale power generation<sup>13</sup>, MW</b>	<b>177.0</b>	<b>200.9</b>	<b>363.4</b>	<b>715.5</b>
• Photovoltaic, MW	66.4	119.7	288.3	626.9
• Wind, MW	16.5	14.3	11.8	17.8
• Bio, MW	16.3	12.9	11.7	13.8
• Hydro, MW	36.2	30.8	28.0	32.6
• Diesel, MW	38.2	20.9	22.2	23.4
• Other, MW	3.3	2.4	1.4	1.0

### **Market opening and competition**

The number of retail suppliers has decreased during the last few years. Some old companies have merged, and the arrival of new entrants has been annulled by companies exiting the market. At the end of 2022, there were 53 retail suppliers supplying electricity for households and other small-scale end-users.

Still, only a few electricity retailers are ownership unbundled from electricity network activities. Most of the legally unbundled electricity retailers still belong to same group of companies as a distribution system operator or are owned by one or several distribution system operators.

Electricity retail supply does not require any license or registration from the Energy Authority.

Even though the exact market shares of individual retailers are not available, the Energy Authority has estimated that six electricity retailers had at the end of 2022 larger than five per cent share of retail market (based on energy volume) and six retailers have more than five per cent of electricity customers. The market share of the three largest companies in the retail market for small and medium-sized customers has been estimated to be about 48 per cent. This has also increased a bit during last few years.

The Energy Authority has estimated that the Herfindahl-Hirschman index (HHI) in terms of energy volumes to measure market concentration in retail market is about 800. HHI based on metering points increased to 1040 and still showing rather competitive marketplace. However, also this metric has been increasing. Number of new entrants and their market share have been low.

On 1 February 2019, new provisions to the electricity market legislation which enable implementation of a centralized data exchange (Datahub) in electricity retail markets in Finland came into force. According to these provisions the Finnish TSO, Fingrid Oyj has obligation to organise and provide information exchange services necessary for market processes in distribution networks and imbalance settlement in distribution grids. Provisions also set obligation to DSOs and retailers to use these services and to ensure that their IT-systems are compliant with the Datahub.

The new provisions have also given powers to the Energy Authority to monitor and supervise that all DSOs and retailers are well-prepared for the commissioning of the Datahub. Datahub went successfully go-live on 21 February 2022. By logging into the Datahub portal, each electricity customer can view the contracts, authorisation and metering data from all consumption places linked to his/her personal identity code.

In 2020, the Energy Authority together with other Nordic energy regulators (NordREG) commissioned a study regarding Nordic data hub interoperability. The study<sup>14</sup>, published in March 2021,

<sup>13</sup> Only generator units with nominal capacity max 1 MVA. Connected to the network

<sup>14</sup> Available at: [Implement Consulting Group - Nordic Data Hub Interoperability \(nordicenergyregulators.org\)](https://nordicenergyregulators.org/)

assessed the potential for reduction of access barriers in the Nordic electricity markets through the introduction of data hub interoperability. The study showed that there are no indications of insufficient competition in the Nordic electricity supply markets. Data hub interoperability will reduce some entry barriers, while other entry barriers will remain unaffected. The report concluded that there are no sizeable socio-economic benefits of data hub interoperability. However, in the longer perspective, sharing data from the national data hubs on a Nordic level could promote new business models related to flexibility services.

In May-June 2022, Nordic energy regulators conducted a customer survey. In the survey<sup>15</sup>, 6,000 customers in Denmark, Finland, Norway and Sweden answered questions about when they last signed or compared electricity contracts, why they were active or not, how much they know about their own contract, and whether it was easy or difficult to sign an electricity contract. A similar survey was conducted in 2018.

## **Prices**

Electricity suppliers may decide retail prices by themselves in Finland. For retail supply, there are no regulated tariffs which should be approved by the Energy Authority or any other authorities before taking into use.

Electricity suppliers offering electricity to end users in Finland shall provide the Energy Authority information on prices, which are applied when supplier is offering electricity in general to the consumers and other end users, whose annual consumption is below 100,000 kWh.

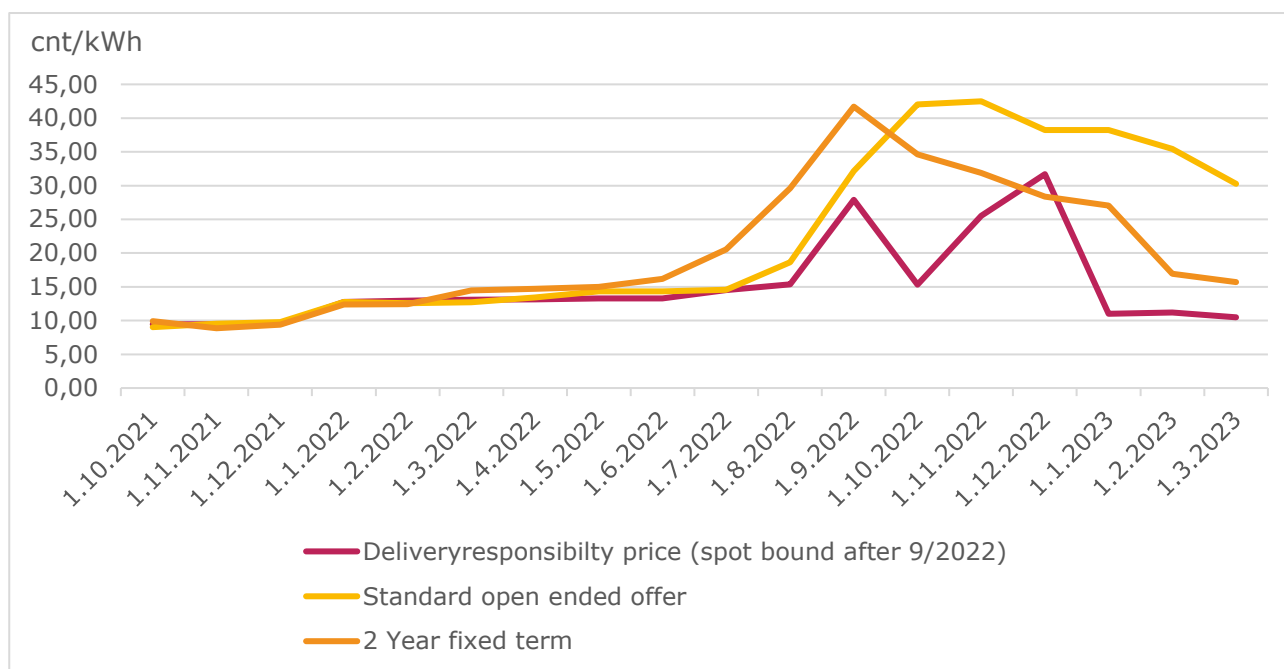
The retail prices increased during the whole year 2022 following the increase in the wholesale energy prices. In 2022, the supply price excluding taxes increased 90 per cent for a residential customer with annual 5,000 kWh consumption. For a household with electric heating the increase was 92.2 per cent. The percentual changes are calculated using the SFC prices in December 2021 and 2022.

In the price comparison website, [sahkonhinta.fi](https://sahkonhinta.fi), the average price of offers for a traditional open-ended contract for electrical energy for a residential customer with annual 5,000 kWh consumption increased by 385 per cent (December 2021-December 2022). For a small house with electric heating (annual consumption 18,000 kWh) the price increase was 268 per cent. The average price of offers for a two years fixed-term contract for a residential customer increased by 236 per cent and for a household customer with electric heating increase was 251 per cent. However, these numbers do not represent the actual increase of households' electricity bills since contracts made prior to fall 2022 had significantly lower prices throughout the year. The increase of the total price including network charges and taxes was 33.1 percent for a residential customer. The offer prices have fallen drastically during the first half of 2023, some contract types almost back to the level they were a year ago.

Figure 3 presents average prices of new supply contracts for a typical household customer in the beginning of each month in 2022. Prices include VAT but exclude grid charges and electricity taxes.

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<sup>15</sup> <https://www.nordicenergyregulators.org/2022/12/finland-has-the-highest-share-of-active-customers/>



**Figure 3. Price of new electricity supply contracts for a household customer (annual consumption 5000 kWh) in different contract types in 2022 (incl. VAT, excl. grid charges and electricity taxes).**

Price of electricity distribution grid services including taxes showed a one per cent decrease for all household consumers. The electricity bill for apartment house households and households with electrical heating increased in total by 33.1 and 35.3 per cent respectively.

The supply related VAT was decreased for a five months period December 2022 – April 2023 from 24% to 10%. The goal was to alleviate the increased electricity costs of households due to high wholesale prices. VAT rate for grid charges remained at 24 %.

Consumption of electricity is subject to the electricity excise tax, strategic stockpile fee and general VAT (24 per cent). Strategic stockpile fee (0.013 cent/kWh) is paid by all end users. Strategic stockpile fee and electricity excise tax are collected by the DSOs and TSO. Electricity excise tax has two categories:

- in category I tax is 2.253 cent/kWh and it is paid by households, public sector, agriculture and services
- in category II tax is 0.703 cent/kWh and it is paid by industry, mining, greenhouses and data centres

### **Prepayment systems**

In Finland, prepayment meters are not in use. Since almost all customers have a smart meter in Finland, suppliers and distribution system operators commonly offers their customers a choice for billing based on their actual electricity consumption.

However, suppliers and distribution system operators are allowed to offer prepayment systems in order to invoice end users in advance based on the estimation. If they offer these kinds of systems to household customers, the system shall adequately reflect likely annual electricity consumption.

## **Dynamic price contracts**

Since the roll-out of smart meters and using hourly measured consumption in balance settlement many retailers have also started to offer even for household customers dynamic electricity price supply contracts where electricity price varies every hour and is bound to day-ahead spot prices added with the supplier's fixed margin.

At the end of 2022, about 14 per cent of retail customers had a dynamic electricity price supply contract. Share of dynamic priced contracts continued to increase also in 2022. This was partly due to the high and volatile wholesale prices in fall which drove most suppliers to offer only spot bound contracts to new customers in order to minimize their own risks.

The most popular supply contract type has been a fixed-term contract during last few years. At the end of 2022 about 50 per cent of retail customers in Finland had a fixed-term supply contract. Most commonly, fixed-term contracts are made for one or two years.

About 36 per cent of retail customers had open-ended supply contract which customer may terminate with two weeks' notice. The share of such contracts remained nearly at the same level as in 2021.

On 1 June 2023 came into force amendment to the Electricity Market Act which requires that all retailers supplying electricity to more than 200,000 customers have to offer dynamic priced contracts provided that the customer is connected into distribution network and has a meter capable for metering with required accuracy. There is a similar requirement also for all retailers having the SOLR (supplier of last resort) status. However, retailers having the SOLR status may not offer dynamic priced contracts only.

## **Smart meter use**

More than 99 per cent of consumption places in Finland had already a smart meter. The Finnish national legislation required that each DSO should have hourly registering smart meters installed in at least 80 per cent of consumption places by the end of 2013. In August 2021, the Government adopted updated regulation for balance settlement and metering which also defines technical requirements for the 2<sup>nd</sup> generation of smart meters.

Metered hourly consumption data is used for the balance settlement, including also households, in Finland.

## **Switching rates**

In 2022 the number of customers switching electricity supplier remained at the same level as in 2021. The estimated number of customers that switched their supplier was about 602,000 which corresponds about 16.3 per cent of all electricity customers. In 2021 the switching rate was 16.2 per cent.

For households switching rate was 16.3 percent (16.2 per cent in 2021).

However, these figures might include also supplier switches which are only due to merger and bankrupt of existing suppliers as they might have been treated as supplier switches in the data exchange and thus cannot be not excluded from data. Thus, actual supplier switching rates might be lower.

## **Distortion or restriction of competition**

The Competition and Consumer Authority protects sound and effective economic competition by intervening, where necessary, in restrictive practices, such as cartels and abuse of dominant position. The Energy Authority may report relevant information to the Competition and Consumer Authority, but such cases have not occurred in 2022. The Energy Authority, on its own behalf, supervises the compliance with the Electricity Market Act containing also some prohibitions to use terms and conditions limiting competition within the electricity sales.

In 2019, Energy Authority established a Smart Grid Forum to support national implementation of smart grid provisions of the Clean Energy Package and proposals from Smart Grid Working Group which was set by the Ministry of Economic Affairs and Employment and submitted its final report in Autumn 2018. The Smart Grid Forum consisted of representatives from the Ministry, the Competition and Consumer Authority and relevant stakeholder organisations representing consumers and electricity companies. Based on discussions at the Smart Grid Forum, the Energy Authority prepared and submitted in July 2021 to the Ministry a proposal<sup>16</sup> to amend national legislation to facilitate so-called combined billing of energy and grid charges to foster competition in retail market. The proposal includes suggestions for necessary practical processes and arrangements to enable voluntary combined billing in which supplier and customer may agree on that the customer will receive from the supplier only one electricity bill which includes both energy and grid payments. The Ministry has not yet put the proposal forward.

### **3.2.3 Consumer protection and dispute settlement**

The consumer authorities are in general responsible for consumer protection in Finland. The Finnish Competition and Consumer Authority ensures that the practices companies use in marketing and their customer relations are appropriate and the contract terms applied by them are reasonable. The Consumer Ombudsman supervises that the Consumer Protection Act and other laws passed to protect consumers are observed.

The Energy Authority monitors the transmission system operators', distribution system operators' and suppliers' overall compliance with the electricity and natural gas market legislation. In particular, the provisions in the legislation concerning electricity and natural gas contracts are aimed at ensuring the minimum protection for household consumers.

Monitoring the retail electricity market is an ongoing process and the Energy Authority follows the market closely in order to ensure that illegal practices are met with due investigations and sanctions. The scope of issues is under constant review and possible courses of action are explored continuously. The Energy Authority has powers to impose necessary and proportionate measures to promote effective competition and to ensure the proper functioning of the electricity market.

## **Complaints by household customers**

In 2022, the Energy Authority received 36 new requests for investigation from household customers related to electricity distribution system operators and suppliers. In addition to these, the Energy Authority received one request for investigation from other parties than household customers and opened on its own initiative two new investigations.

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<sup>16</sup> <https://energiavirasto.fi/documents/11120570/120184679/Energiavirasto+esitys+s%C3%A4hk%C3%B6n+myynnin+ja+jakelun+maksujen+yhteislaskutus+1548-403-2021.pdf/4311167c-b361-d387-11a8-0851d8d30f01/Energiavirasto+esitys+s%C3%A4hk%C3%B6n+myynnin+ja+jakelun+maksujen+yhteislaskutus+1548-403-2021.pdf?t=1652265595978> (in finnish)

In 2022, the Energy Authority made decision in 27 cases. Some of these cases were already received in previous years.

These statistics do not include the phone calls or other written inquiries from the energy companies' customers or other market participants received during the year. The requests for investigation and other inquiries fell into the following categories: connection charges, network tariffs, quality of supply, metering, contractual issues, invoicing, disconnections, reasonableness of electricity prices under the obligation of supply and compensation to the distribution system operator for the costs of supplying electricity.

### **Disconnection rates**

The Energy Authority does not collect data on disconnections due to non-payment or for other customer-related reasons.

### **Restrictive contractual practices**

In 2022, the Energy Authority gave decisions regarding one retailer which went bankrupt in December 2021. As a result, multiple consumers had to rely on their DSOs for electricity. Normally in such situation DSOs are obliged to ensure electricity supply for affected consumers at least for a 3-week period under section 102 § of the Finnish Electricity Market Act. However, due to the national Datahub testing period, there was a temporary law in force from November 1 2021 until March 31 2022, and that extended this DSO's period of responsibility to ensure electricity supply until the Energy Authority's decision on suppliers of last resort, to whom the customers were then transferred. The transfer was only carried out if had the customers not succeeded to find themselves a new supplier in the meantime. The Energy Authority gave 16 decisions on transferring customers from DSOs to SOLRs.

In August 2022, a company with 70 000 thousand customers announced that it would stop supplying electricity to customers and make exit from the retail market from 1 September 2022. The Energy Authority published instructions for the company's customers who have been notified by the company that it will stop supplying electricity. The company had made an agreement to transfer some of the supply contracts to another company as part of its restructuring, while the remaining supply contracts were terminated, and the customers had to find a new supplier and contract by themselves. Therefore, the Energy Authority did not have to make any decisions in relation to the company's exit from the market. Later that year, the company, which stopped supplying electricity filed for bankruptcy.

In September 2022, one supplier with the SOLR status on two DSOs area of responsibility went bankrupt and exited the market. According to section 67 § of the Finnish Electricity Market Act, the Energy Authority may order the retailer with significant market power or the largest market share in its area of responsibility to sell electricity to customers subject to the obligation to supply. Due to this the Energy Authority gave two decisions concerning which suppliers have the SOLR status on the two DSO's area of responsibility. The decisions were given approximately 3 weeks after the supplier exited the market.

Despite the volatility of the electricity market in 2022, apart from these two companies, no other suppliers went bankrupt or exited the market during the year.

Under section 102 § of the Finnish Electricity Market Act the consumer must compensate to the DSOs the reasonable costs of supplying the electricity. If the consumer and the distribution system operator cannot agree on the compensation, the Energy Agency determines the amount of compensation. In 2022, the Energy Authority received several requests for investigation concerning the compensation of electricity supply costs to the distribution system operator. The preparation of these decisions occupied the resources of the Energy Authority during 2022.

The Energy Authority made several decisions on breaches of the provisions of the Electricity Market Act and related legislation.

During 2022, the Energy Authority was also handling several advice requests from customers. The Energy Authority received a large number of consumer complaints and advice requests especially regarding multiple retailers increasing the prices of their electricity supply contracts. Most of these changes in contract details were due to the increases in the electricity wholesale market prices.

As the Energy Authority does not have jurisdiction to investigate the basis for the contractual changes, some of these consumer complaints and requests for advice were redirected to the Finnish Competition and Consumer Authority instead, thus using the resources of both Authorities.

### **Protection of energy poor and vulnerable household customers**

Energy poverty or vulnerable customers are not defined in the national energy legislation. Under normal circumstances, there isn't any public intervention in suppliers' price setting either. In Finland, the social security system is in place for those people who cannot afford the necessary housing expenses including energy bills.

However, in autumn 2022, the Finnish Parliament approved a temporary law to reduce VAT on electricity sales from 24% to 10%, excluding network-related charges. The VAT reduction was valid from 1 December 2022 to 30 April 2023 and was intended to mitigate the impact of electricity price increases on households and to improve households' purchasing power in times of high inflation.

In addition to the temporary VAT reduction for electricity supply, the government designed and introduced late 2022 also some other temporary measures to help those consumers which were suffered by increased electricity prices.

Firstly, payers of very high electricity costs during January – April 2023 may apply a tax credit from the Tax Authority. If the total 4-month cost for electricity exceeds EUR 2,000 customer is entitled to the tax credit. The size of the credit is 60 per cent of the part going over the 2,000-euro threshold. Maximum credit is EUR 2,400 per one permanent residence. No tax credit for electricity is available for summer cottages, holiday homes, etc. Tax credit is available only for electricity supply costs.

Secondly, if customer's taxes for the year are low, so the tax credit for electricity would not be useful, the customer can apply to Kela for temporary electricity assistance. The customer cannot get both tax credit and assistance. The customer can receive assistance with electricity costs from Kela for electricity costs incurred in a permanent dwelling for the period 1 January to 30 April 2023. The assistance is available for the electricity costs of one dwelling only, and this dwelling must be located in Finland. The amount of the assistance is 60 per cent of the amount of the electricity bill, excluding the cost of electricity transmission and the own liability of EUR 400. The maximum amount of assistance is EUR 660 per month.

Thirdly, the Parliament adopted in February 2023 a temporary law on retroactive reimbursement for electricity supply costs for consumers. The reimbursement is for realised supply costs during November 2022 – January 2023. The amount of the reimbursement is 50 per cent of the amount of the electricity bill, excluding the cost of electricity transmission and the own liability of EUR 90 per month. The maximum amount of reimbursement is EUR 700 per month. The reimbursement for costs in January 2023 is paid double. In addition, for being eligible for the reimbursement the average monthly supply price should have been more than 10 cent/kWh unless the consumer has had a dynamic priced supply contract.

Finally, the Parliament adopted in February 2023 also a temporary law for extended payment periods of electricity bill. According to the law, retail customers are entitled by request for an extended payment periods of electricity bill related to energy consumption during period 1 January 2023 – 30 April 2023. The maximum extension is for non-commercial end users 120 days and for commercial customers 60 days.

Some restrictions to disconnection due to non-payment exist in the Electricity Market Act to protect household customers in specific circumstances. If the non-payment is caused by the end user's financial difficulties due to serious illness, unemployment or some other special cause, principally through no fault of their own, the disconnection may take place at the earliest two months after the due date of the payment. Furthermore, the disconnection due to non-payment is not allowed between the beginning of October and the end of April in an electrically heated building or in a part of a building that is used as a permanent residence, until four months have elapsed since the due date of the outstanding payment.

According to the Electricity Market Act an electricity retailer with a significant market power or the highest market share within the area of responsibility of a distribution system operator has so-called obligation to supply. The obligation means that the retailer shall supply electricity at reasonable prices to consumers and other users of electricity whose place of use is equipped with main fuses of 3x63 amperes at maximum or whose site of electricity use receives annually no more than 100,000 kWh of electricity. Terms and conditions regarding this obligation shall not include any unreasonable provisions or limitations that would restrict competition within electricity trade. The Energy Authority may order the retailer referred to here to sell electricity to the customers within the obligation to supply.

The prices of electricity within the obligation to supply system do not have to be approved by the regulator before the supplier takes them into use. By virtue of the Electricity Market Act the Energy Authority may investigate either on the basis of a complaint or at its own initiative the pricing of electricity within the obligation to supply. In 2022, the Energy Authority received several complaints regarding the pricing of electricity within the obligation to supply and opened investigations regarding 17 different companies.

### **Availability of comparison tools**

To promote effective competition in the electricity retail market, the Energy Authority has since 2006 maintained a web-based system designated to facilitate price comparisons and supplier switching. In November 2019, the Energy Authority took into use the renewed service with aim to better fulfil customers' needs. The system has been developed to inform customers about the origin of the electricity they purchase and about the suppliers willing to buy their customers' self-generated surplus electricity. All retail suppliers are obligated to maintain up-to-date information on their public electricity price offers for household customers and other small end-users on this service. In 2022, this comparison tool fulfilled 7 out of 8 criteria that are set in the Directive (EU) 2019/944.

The Energy Authority has provided a lot of advice to end-users and suppliers about the procedures and functionalities of the comparison tool. It has also addressed issues concerning different forms of abuse of the price comparison website by suppliers aiming to appear as one of the suppliers with the cheapest products.

In addition to the price comparison tool maintained by the Energy Authority, there are also other similar services for comparing electricity price offers maintained by private parties. Some of these tools also provide possibility to customers to make a supply contract with a chosen supplier.

## **Obstacles to and restrictions of consumption of self-generated electricity and citizen energy communities**

Electricity customers may install own small-scale power generation facilities like PV panels to the roof-top of their apartment by notifying the DSO and use this self-generated energy in the same facilities. In case they have surplus of generated energy, they may conclude a contract with party who is willing to buy the surplus. The regulation does not include provisions concerning pricing of this surplus energy and usually the price reflects current wholesale prices.

Increasing number of customers have installed PV panels to cover part of their electricity consumption with a self-generated energy. Normally those panels are of size that they do not create surplus which could be injected to the network.

Also, some housing companies have been interested to invest own PV generation. However, unclear rules on sharing surplus of self-generated energy between the members of the housing company have partly been delaying these investments.

In 2020, the Ministry of Economic Affairs and Employment prepared legislative amendments which would improve local energy communities' possibilities to consume and share self-generated energy within a local energy community. These amendments into the Government Decree entered into force in January 2021. New provisions facilitate to distribute self-generated electricity among the community or the group of active customers on the same property or group of properties. The regulation also applies, under defined prerequisites, to individual end-users and thus improves their opportunities to utilize self-generated electricity as well. The decree stipulates the rules for netting of consumption and production in the balance settlement and calculating the compensation of jointly produced electricity for each consumption point. The decree has a transitional period until the 1<sup>st</sup> of January 2023 from which date the netting and calculation of compensation inside the imbalance settlement period have to be offered by the Datahub. Before that, and as regards the calculation of compensation even until the 30<sup>th</sup> of June 2023, the provisions allow DSOs voluntarily to provide these services in their distribution network for members of the local energy communities or the group of active customers.

## **Dispute settlement**

The Energy Authority does not have powers for dispute settlements between consumers and energy companies in individual contractual disputes. The disputes between household consumers and entrepreneurs in individual cases may be solved in the Consumer Disputes Board which is a neutral and independent expert body whose members represent consumers and business in a balanced way. The Board's written decision is a recommendation, and the parties are not obliged to follow it. A dispute handled by the Board can always be taken to a court of law. Furthermore, the Consumer Advisory Service is a national service that provides information on consumer rights, and mediation assistance in disputes between household consumers and entrepreneurs.

The Consumer Ombudsman may assist a household consumer in an individual dispute in the court if the issue carries significant impact or the entrepreneur is not compliant with the decision of the Consumer Disputes Board. The Consumer Ombudsman may also bring group complaints to the Consumer Disputes Board or initiate class actions, for instance, against a network operator or supplier and act as the representative of the plaintiffs in a general court of law.

Individual disputes between non-household customers and businesses are solved in a general court of law or in an arbitral tribunal if agreed so. The Parliament adopted in February 2023 a new law on dispute settlement between business customers and energy companies as required by the Directive (EU) 2019/944. Legislation regarding an independent Energy Market Disputes Board to specifically solve contractual disputes between energy companies and business customers will enter into force on 1 September 2023.

# Gas market

## 4.1 Network regulation

The Finnish natural gas market was opened for competition on January 1, 2020. In the initial phases of competitive market, the approval decisions on terms and conditions for capacity allocation and transmission services were given only for a term of one year to gain practical experience from open gas markets. The approval decisions made in 2021 on terms and conditions for capacity allocation and transmission services for 2022 onwards was made until further notice because gained experience of the open gas market has showed that the terms and conditions are sufficient to support efficient and transparent functioning of the open gas market.

Some key indicators on gas networks are presented in the following table (Table 5).

**Table 5. Indicators for gas network**

Indicators	2018	2019	2020	2021	2022
Maximum gas daily consumption TWh/d <sup>17</sup>	0.161	0.143	0.110	0.179	0.114
Pipeline entry capacity TWh/y HCV <sup>18</sup>	80	80	109	109	82
Pipeline exit capacity (exports) TWh/y HCV <sup>19</sup>	0	0	29	29	29
LNG Gas Storage Capacity nm <sup>3</sup> <sup>20</sup>	80,000	80,000	80,000	80,000	258,806
Number of TSOs	1	1 <sup>21</sup>	1	1	1
Number of DSOs	25	22	18	17	17

### 4.1.1 Unbundling

#### Unbundling of TSO

Prior to 2020, there was neither legal nor operational requirements in place for unbundling of natural gas transmission network operation. The only wholesale supplier of natural gas – Gasum Oy – was also the sole importer and operator of the transmission system until end of 2019. TSO activities were unbundled only in accounts.

Due to the Natural Gas Market legislation, gas transmission system operations were ownership unbundled from electricity and gas generation and supply by the 1 January 2020. A new gas TSO Gasgrid Finland Oy was unbundled through a partial demerger from Gasum Oy that entered into force on 1 January 2020. Furthermore, the ownership of transmission system operation was transferred to the Ministry of Finance on 1 January 2020.

Gasgrid Finland Oy submitted its application for the certification of the TSO to the Energy Authority in January 2020. Final certification decision was given on 19 August 2020. Gasgrid Finland Oy is fully owned by the State of Finland.

<sup>17</sup> Until end of 2019 energy volumes are expressed by using low calorific value and from 2020 by using higher calorific value.

<sup>18</sup> Technical capacity without limitations (caused for example by compressor station delays)

<sup>19</sup> Technical capacity without limitations

<sup>20</sup> Storage capacity in off-grid LNG terminals is 80 000 nm<sup>3</sup>. Number for 2022 includes also storage capacity located in LNG terminals in Hamina and Inkoo. In Finland there are no other gas storages.

<sup>21</sup> Until end of 2019 TSO was a part of vertically integrated gas wholesale supply company (unbundling only in accounts).

Energy Authority has had a process with Gasum Oy in the Market Court concerning accounting unbundling and cross subsidization in financial statements 2017-2020. In its decision on 7 November 2022, the Market Court has annulled the cross-subsidy decisions issued by the Energy Agency to Gasum Oy and has rejected the penalty payment proposal submitted by the agency to the Market Court. The Energy Agency has appealed the matter to the Supreme Administrative Court.

### **Unbundling of DSO**

Legal and operative unbundling requirements are not required from distribution network operators in Finland as Member States may decide that the unbundling provisions are not applied to network operators with less than 100,000 customers. All Finnish natural gas distribution system operators fall below the limit set by the Directive.

The accounting unbundling requirement applies to all distribution system operators. The accounting unbundling is also required in the companies, which have other activities besides natural gas network business if these activities are not relatively small. As a relatively small activity has been considered such business activities, whose annual revenue is less than 10 per cent of total revenue of the company's natural gas supply operations.

### **4.1.2 Network extension**

According to national legislation, gas TSO does not have obligation to prepare and submit to the Energy Authority national network development plans for review. Thus, Energy Authority does not have power to monitor national network investment plans and assess the consistency with Community-wide ten-year network development plans (TYNDP).

### **4.1.3 Network and LNG tariffs for connection and access**

#### **Regulation of network tariffs and charges**

According to the Natural Gas Market Act, the network operators may set the actual network tariffs and charges by themselves. There is no ex-ante approval of tariffs or prices of network services by authorities.

The Energy Authority confirms ex-ante the methodology to be used in revenue cap regulation applied in setting transmission and distribution network tariffs and methodology for connection charges. The Energy Authority shall approve ex-ante also the terms and conditions of network and connection services before the network operators are able to implement them.

The methodology for revenue cap regulation of gas transmission and distribution network tariffs is confirmed by the Energy Authority prior to each regulatory period. After end of the regulatory period, the Energy Authority will validate the earnings of each network operator in its supervision decisions for the whole regulatory period and will confirm the amount of any accrued earnings that exceed or fall short of reasonable earnings for the regulatory period. Where necessary, the supervision decisions will include an obligation to return to the customers any excess profit for the completed regulatory period through pricing for the new regulatory period. The supervision decisions will correspondingly confirm that the network operator may allow in its pricing for the new regulatory period, for the amount by which the earnings accruing to the network operator from the previous regulatory period fell below the reasonable earnings level.

The length of regulatory periods is four years. In November 2015, the Energy Authority confirmed with its decisions the methodology to be followed in natural gas system operation during the third and fourth regulatory periods in 2016 – 2019 and 2020 - 2023.

Based on Article 26 of Commission Regulation (EU) 2017/460 of 16 March 2017 establishing a network code on harmonized transmission tariff structures for gas (TAR NC) Gasgrid Finland Oy started hearing of the tariff methodology in early 2020. In October 2020, Energy Authority approved the reference tariff methodology in line with tariff network code (2017/460, TAR NC). TSO shall use the reference tariff methodology in setting tariffs from 1 January 2021.

After end of derogation in the beginning of 2020, Gasgrid Finland Oy started hearing of the tariff methodology in early 2020. In October 2020, Energy Authority approved the reference tariff methodology in line with tariff network code (2017/460, TAR NC). TSO should use the reference tariff methodology in setting tariffs from 1 January 2021.

In accordance with Article 28 of Commission Regulation on establishing a network code on harmonized transmission tariffs structures for gas (Tariff Network Code) the Energy Authority conducted a consultation with the national regulatory authorities of all directly connected Member States and the relevant stakeholders on the following:

- the level of multipliers
- if applicable, the level of seasonal factors and the calculations set out in Article 15
- the levels of discounts set out in Article 9(3) and 16.

The consultation was open from 11<sup>th</sup> until 25<sup>th</sup> November 2022. The Energy Authority gave in November 2022 a motivated decision on the level of multipliers, seasonal factors and discounts.

### **Regulation of LNG tariffs and access**

As all off-grid LNG terminal projects in Finland have received state-aid, European Commission has requested that the regulation concerning the 3<sup>rd</sup> party access and ex-ante approval of terminal tariffs shall be applied to those LNG terminals.

In January 2022, the Energy Authority approved tariffs for the off-grid LNG terminal in Pori and in December 2020 the Energy Authority approved tariffs for the off-grid LNG terminal in Tornio.

In July 2022, the Energy Authority approved tariffs for the Hamina LNG terminal. The third LNG terminal in Hamina opened for commercial operation on 16 September 2022. The Hamina terminal is the first on-grid LNG terminal in Finland. Its storage capacity is 30,000 nm<sup>3</sup> and injection capacity is 6,000 MWh/d. The Hamina terminal is connected to both the low-pressure DSO network and high-pressure TSO network.

In December 2022 floating LNG terminal vessel Exemplar (FSRU) anchored in the harbour at Inkoo, Finland. Its maximum storage capacity is 148,806 nm<sup>3</sup> and the injection capacity is 140 GWh/d. The Floating Terminal Finland Oy has been operating the floating LNG terminal from winter 2023 onwards. In November 2022, the Energy Authority approved tariffs for the Floating LNG Terminal Finland Oy terminal. On November 30, 2022, the Energy Authority granted Floating LNG Terminal Finland Oy the right to limit the use of the floating LNG terminal ship for ten years. The decision makes it possible that liquefied natural gas of Russian origin will not be handled on the terminal. Floating LNG Terminal Finland Oy is a wholly-owned subsidiary of Gasgrid Finland Oy.

#### 4.1.4 Balancing

Energy Authority approves the terms and conditions for the gas market under the Act on the Regulation of the Electricity and Gas Markets (590/2013), including the main principles of the balancing in Finland. The rules approved in 2020 are still applicable and no changes to the balancing rules are made after the year 2020. These approved terms and conditions also include the methodology used to calculate the provision of balancing services.<sup>22</sup>

Finnish Transmission System Operator (TSO) with system responsibility, Gasgrid Finland, is responsible for balancing in the Finnish gas system. Gasgrid Finland is also responsible for the physical balance of the Finnish gas system and for organizing both balancing and balance settlement. Gasgrid takes care of the physical balancing by optimizing the level of pressure.

The balancing period is the gas day, which commences at 7:00 am and ends at 7:00 am on the following day. A shipper's or trader's injections and withdrawals of gas energy must be of equal quantity over the period in question, that is, participants are responsible for their own commercial balance in the market.

A shipper or trader may act as a balance responsible party by itself or outsource balance responsibility to another shipper or trader. The market model enables multiple ways of achieving balance as, in addition to forming and merging balance groups, participants may buy/sell gas over the counter between each other or on a gas exchange or, alternatively, export gas via the Balticconnector.

#### 4.1.5 Cross-border issues

The Balticconnector pipeline, a link between the Finnish and Baltic gas networks, was commissioned in December 2019. The commercial operations of the link started on January 1, 2020. Prior to that there were no other interconnections except for the Imatra entry point for gas importing from Russia. Gas flow from Russia was suspended on the 20<sup>th</sup> of May 2022.

According to national regulation, TSO has obligation to submit their capacity allocation and congestion management rules to NRA for confirmation. In November 2021, the Energy Authority approved capacity allocation methodology applicable in the Balticconnector interconnection point for an indefinite period. The decision was coordinated with the Estonian national regulatory authority. In the approved methodology auctioning at Balticconnector is not applied, but instead capacity is allocated implicitly (CAM NC 30 article). However, Energy Authority takes the changing market situations into account and, if reasonable, will re-assess the approved methodology.

Regarding the designing of provisional/final transmission and distribution tariffs or methodologies, see chapter 4.1.3.

The Energy Authority is appointed to resolve conflicts against TSO, DSO and LNG operators, in relation to that operator's obligations under the directive.

Since 2017, Finland and the Baltic states have been working actively towards the achievement of the gas market integration of the four countries. Established for this purpose, the Regional Gas Market Coordination Group (RGMCG) meets around four times a year. Participating in the work of RGMCG are the countries' ministries for energy, transmission system operators and authorities supervising the energy market.

During 2021-2022 the Finnish and Baltic transmission system operators have been working on the proposal for 4-country single entry tariff zone, without internal cross-border entry and exit fees. In November 2021, the national regulatory authorities of Finland, Estonia, Latvia, and

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<sup>22</sup> Unofficial English translation of the Terms and Conditions of Balancing can be found here: <https://gasgrid.fi/wp-content/uploads/Terms-and-conditions-of-balance-management-2.0-unofficial-english-translation.pdf>.

Lithuania received an application from the TSOs for a coordinated opinion on gas transmission entry tariff and inter-transmission system operator compensation mechanism among Finnish, Estonian, Latvian and Lithuanian gas TSOs. The objective was that the 4-country single entry tariff zone should enter into force from the beginning of gas year 2023. However, on 12 October 2022 FinBalt NRAs chairs agreed to postpone FinEstLat and Lithuanian gas market merger determining that merger could happen no sooner than in October 2024. This decision was taken because the geopolitical situation in 2022 has caused significant changes in the fundamentals of the region's gas market. Consequently, the ITC mechanism, which was developed based on other assumptions about the functioning of the market, no longer corresponds to the current situation and may not provide benefits to all parties involved.

On January 20, 2023, TSOs proposed to postpone the submission of updated or new ITC application of four country ITC mechanism until the new region's gas supply model is stabilised and the role of the region's gas infrastructure in supply of gas beyond the borders of the region has become clear.

Energy Authority does not have the competence to monitor investment plans and assessment of consistency with Community-wide network development plan, PCIs and national development plans.

#### **4.1.6 Implementation of Network Codes and guidelines**

Finland has availed itself of the possibility of the derogation allowed by the Natural Gas Market Directive. Following this, certain provisions from the European natural gas market regulation, e.g. network codes, were not applied in Finland.

Finland decided to end the derogation from January 1, 2020. Since then, the network codes have been applicable in Finland.

## **4.2 Competition and market functioning**

### **4.2.1 Wholesale markets**

#### **Effectiveness of competition**

Until end of 2019, the Finnish natural gas market was isolated with a pipeline connection only to Russia. There was also only one gas wholesale supplier. Commissioning of Balticconnector pipeline in December 2019 connected the Finnish gas market to Baltic gas markets and enabled gas market opening for competition from 1 January 2020.

Gas import through the Imatra entry point was suspended on 21 May 2022 due to currency-related matter with Gazprom. Since then, gas has been imported into the Finnish gas system through Balticconnector. In addition to the import through Balticconnector, it is now possible also to inject gas from new LNG terminals. A new on-grid LNG terminal in Hamina was commissioned in October 2022.

Commissioning of LNG terminal vessel in Inkoo in January 2023 ensured security of supply in Finland and added another significant source in to Finnish energy mix. Construction of the port terminal was completed just before Christmas 2022. The floating LNG terminal arrived at the port in December 2022.

Finland has only small amount of domestic biogas production of which only a small part is injected into gas grids.

In 2022, high gas prices and uncertainties with security of supply influenced remarkably on gas consumption. As a result, gas consumption was decreased by 52 per cent. Especially, heat and power plants and industrial end users reduced their gas use. Some remarkable end users also decided to use alternative fuels instead of gas.

Some indicators on gas wholesale market are presented in the following table (Table 6).

**Table 6. Natural gas wholesale market indicators. (2021 figures preliminary) <sup>23</sup>**

<b>Natural gas wholesale market indicators</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021*</b>	<b>2022</b>
Domestic gas production (only biogas) GWh <sup>24</sup>	934	894	876	905	913
• Biogas injected into the transmission grid GWh	101.42	95.40	108.81	144.64	157
Total gas demand TWh	24.7	23.2	25.4	25.1	11.7
• Imports volume (by pipeline) TWh	24.7	24.7	25.3	25.1	12.3
• Imports LNG volume TWh <sup>25</sup>	n/a	n/a	n/a	n/a	0.3
• Exports volume (by pipeline) TWh	n/a	n/a	0	0.07	0.6
Number of active wholesale companies	1	1	34	39	49
Number of traders active in the wholesale market	n/a	n/a	16	19	19
Gas delivery from transmission grid to customers (mcm/y)	2,456	2,480	2,256	2,235	1,069
• Heat and power plants	875	820	742	708	170
• Industrial customers	1,337	1,341	966	1,000	648
• DSO grids	232	258	503	513	240
• Other customers	11	62	46	13	11

Finnish wholesale gas market is characterized by large share of gas used by end-users connected directly to the transmission grid. Only about 23 per cent of gas is used by customers connected to the distribution grid. Large industrial end users and heat and power plants covered approximately 77 percent of the total gas consumption in 2022.

## **Prices**

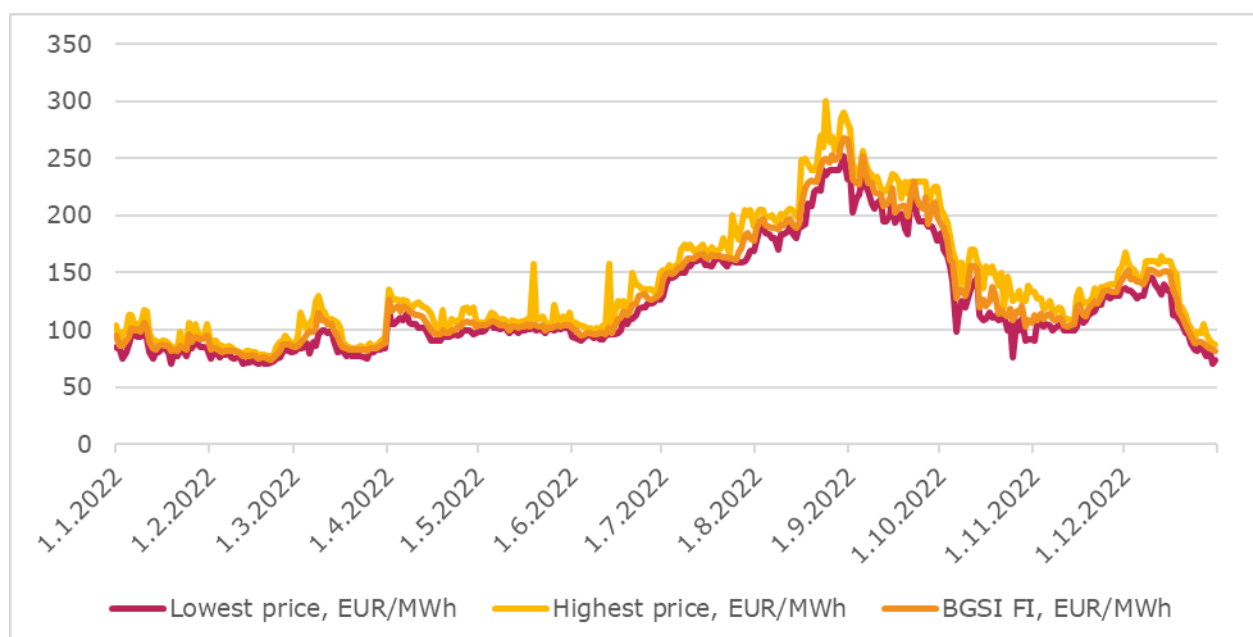
Since the beginning of 2020 gas trading services has been provided by GetBaltic, the common Finnish-Baltic gas exchange.

The following figure (Figure 4) illustrates the daily prices of fulfilled trades for Finland in GetBaltic in 2022.

<sup>23</sup> Until end of 2019 energy volumes are expressed by using low calorific value and from 2020 by using higher calorific value.

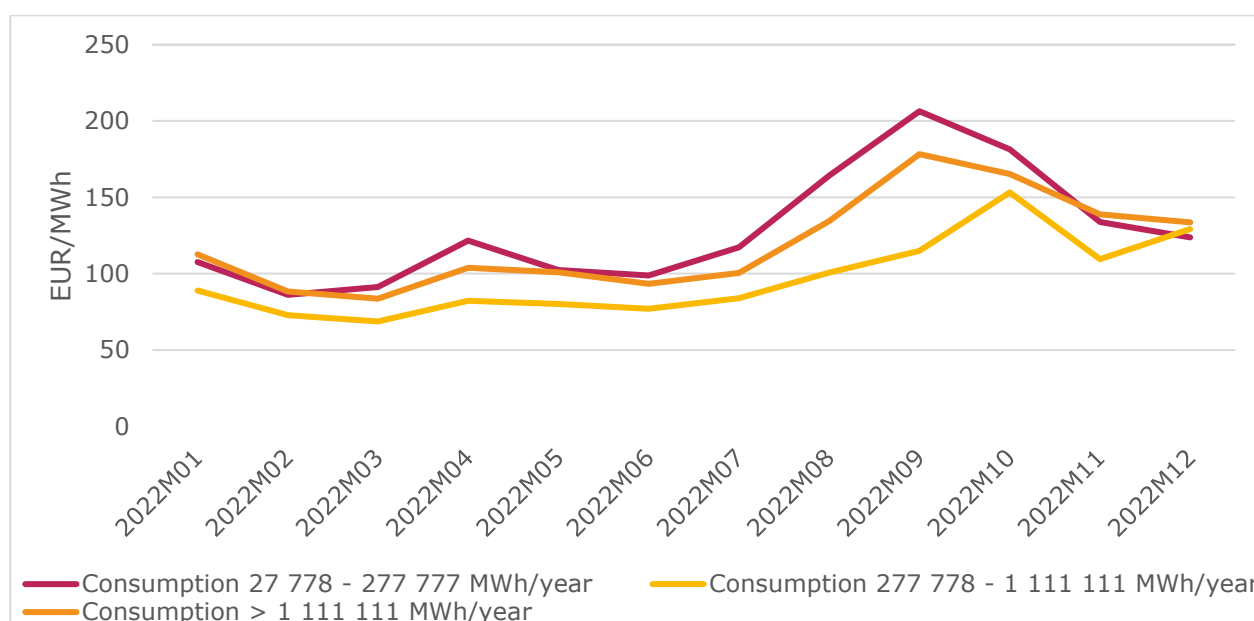
<sup>24</sup> Source: Statistics Finland

<sup>25</sup> Injected gas from LNG terminals to the gas grid. Imports through off-grid LNG terminals excluded.

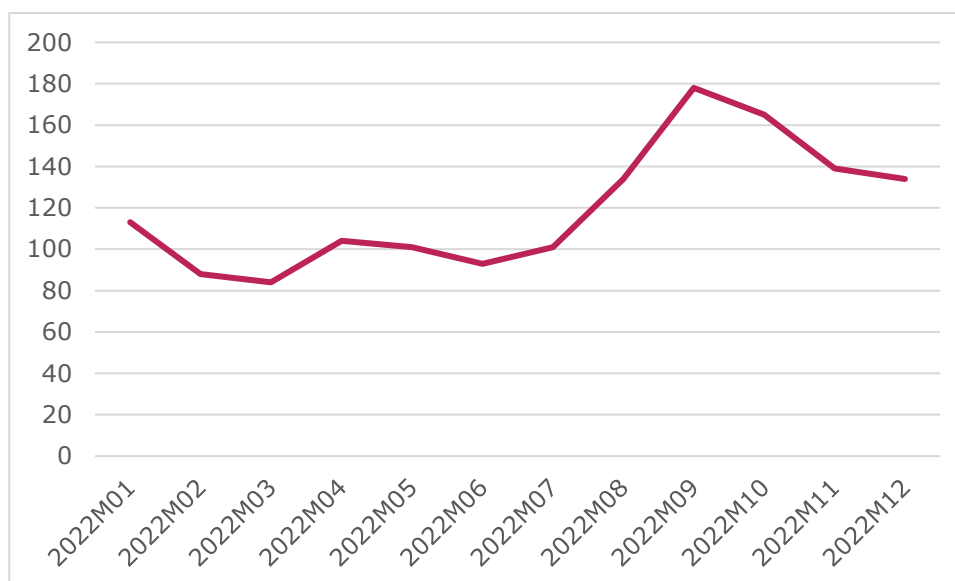


**Figure 4. Price of fulfilled trades for Finland on a daily market in GetBaltic in 2022 (source: GetBaltic).**

Figure 5 illustrates how the natural gas price developed during year 2022 within different gas consumption groups of transmission network customers. The prices increased heavily during year 2022 in every consumption level. In Figure 6 can be seen that the price of natural gas increased also in power production during year 2022.



**Figure 5. Price of natural gas to transmission network customers in 2022 (excl. taxes). (Source: Statistics Finland)**



**Figure 6. Price of natural gas in power production (EUR/MWh). (Source: Statistics Finland)**

### **Transparency**

The REMIT regulation also applies to gas markets. Market participants operating in wholesale gas markets are obliged to register to their national regulatory authority and to report their wholesale energy market transactions to ACER. They are also obliged to publish inside information and are prohibited to do insider trading or market manipulation. Energy Authority performs similar monitoring and investigatory activities on gas markets as on electricity markets.

### **4.2.2 Retail market**

Some indicators on gas retail market are presented in the following table (Table 7).

**Table 7. Natural gas retail market indicators.**

<b>Natural gas retail market indicators</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022*</b>
<b>Number of DSO customers</b>	<b>32,858</b>	<b>28,014</b>	<b>26,485</b>	<b>23,937</b>
• Small houses and customers using only for cooking	29,535	28,809	23,797	21,590
• Housing buildings	1,905	1,065	679	574
• Commercial and public buildings	1,252	1,219	1,130	983
• Local district heating	113	104	99	83
• Greenhouses	27	23	16	14
• Industrial customers	640	597	555	483
• Power plants	9	9	9	10
• Gas tanking stations	141	141	140	139
• Others	46	47	60	61

<b>Evolution of the retail price of gas for reference customer categories<sup>26</sup>, EUR/MWh, yearly average</b>				
• Consumption <278 MWh/y	na	na	75.61	176.92
• Consumption 278 - 2 777 MWh/y	na	na	53.26	134.00
• Consumption 2 778 - 27 777 MWh/y	na	na	46.41	113.58
• Consumption 27 778 – 277 777 MWh/y	na	na	49.25	149.40

### **Market opening and competition**

The retail supply of natural gas covers about 23 per cent of the total consumption. There are only nearly 24,000 gas end-users in the natural gas market.

The largest customer segment, (nearly 21,500 customers, about 90 per cent of all gas end-users) consists of households and customers who buy natural gas only for cooking at home. However, the total natural gas consumption of this segment amounts to only 10,8 mcm (about 0.5 per cent of total gas consumption). In Finland, only a few thousand customers are using gas for heating their houses.

The number of retail suppliers has decreased by one in 2022. There are 14 companies registered as retailers and 17 distribution network operators. The customer segments vary among suppliers, some of gas suppliers serve mostly households while others have only industrial customers.

Since 1 January 2020, gas retail market has been opened for competition and all gas customers have been able to choose their supplier. However, to switch a gas supplier, the customer must have a remotely readable gas meter.

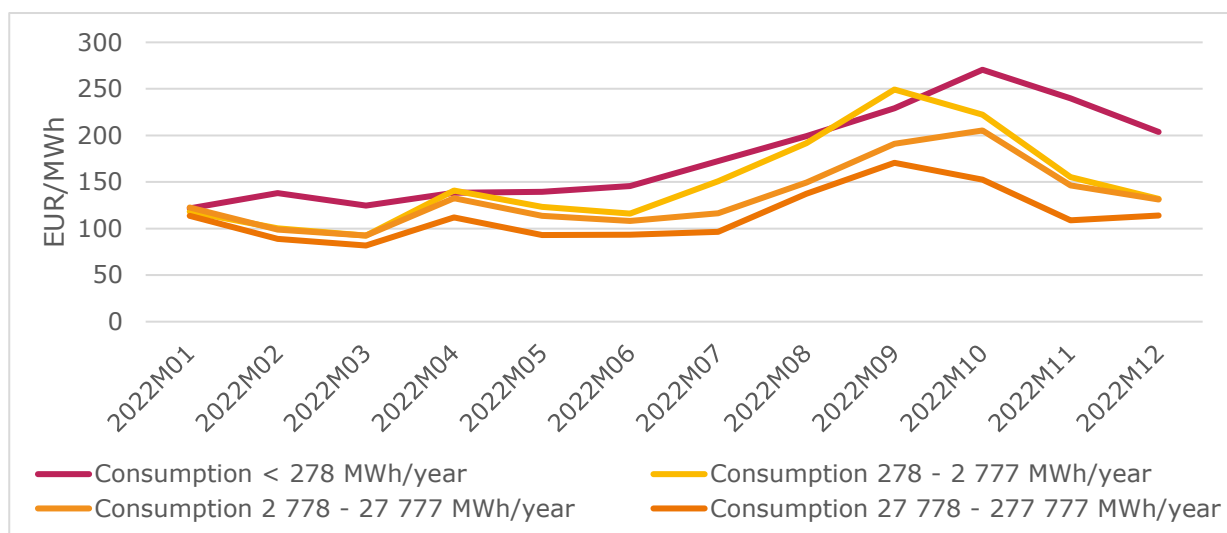
### **Prices**

In retail level, many retailers have only a few customers which are also different in their gas consumption profile. According to the Natural Gas Market Act the retailer in a dominant market position in a natural gas distribution network shall supply natural gas at reasonable price upon the request of an end-user using gas mainly for heating apartment or other end-users whose connection capacity is maximum 250 kW (obligation to supply).

The retailer with obligation to supply shall have public terms, prices and criteria for determining them for the end-users in question. However, before publishing above mentioned information, the retailer with obligation to supply, shall provide the Energy Authority information on prices.

Figure 7 illustrates gas retail price development for certain reference customer categories in 2022.

<sup>26</sup> Excluding taxes. Data before 1 January 2021 is not available. Yearly average is calculated as an average of the monthly averages reported by Statistics Finland. Source Statistics Finland.



**Figure 7. Price of natural gas to distribution network customers (excl. taxes). (Source: Statistics Finland)**

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

As regards the supervision of natural gas retail pricing under obligation to supply, the powers of the Energy Authority are ex post by their nature. As stated above, in retailers with obligation to supply shall inform Energy Authority regarding the prices before publishing them.

In 2022, Energy Authority did not make any investigations on gas retail prices under obligation to supply. However, an inquiry was submitted to the Energy Authority in February 2022, regarding the notification procedures for changes in natural gas prices to the end users and the fairness of natural gas pricing. The Energy Authority decided to handle these issues separately, as dealing with them simultaneously would have caused unnecessary delay.

Furthermore, gas retail customers have been able to switch the gas supplier only from the beginning of 2020. The Energy Authority has not yet collected data on switching rates.

## **4.2.3 Consumer protection and dispute settlement**

### **Ensuring access to consumption data**

According to Natural Gas Market Act end users have a right to receive the metering data on their own consumption free of charge. Likewise, they have a right to give any other party access to that data. The metering data must be given in the format that corresponds to general procedures followed by the industry and the network system operator. In 2022, the Energy Authority did not have any investigations regarding the access to consumption data.

### **Consumer protection**

The consumer authorities are in general responsible for consumer protection in Finland. The Finnish Competition and Consumer Authority ensures that the practices companies use in marketing and their customer relations are appropriate and the contract terms applied by them are reasonable. The Consumer Ombudsman supervises that the Consumer Protection Act and other laws passed to protect consumers are observed.

The Energy Authority monitors the transmission system operators', distribution system operators' and suppliers' overall compliance with the electricity and natural gas market legislation. In particular, the provisions in the legislation concerning electricity and natural gas contracts are aimed at ensuring the minimum protection for household consumers. The requirements set out in the Directive 2009/73/EC and its Annex 1 have been implemented in the national legislation.

### **Complaints by household customers**

Regarding the compliance with the natural gas market legislation, as stated above, an inquiry was submitted to the Energy Authority in February 2022, regarding the notification procedures for changes in natural gas prices to the end users and the fairness of natural gas pricing. The Energy Authority has decided to handle these issues separately, as dealing with them simultaneously would cause unnecessary delay.

### **Dispute settlement**

The Energy Authority does not have powers for dispute settlements between consumers and energy companies in individual contractual disputes. The disputes between household consumers and entrepreneurs in individual cases may be solved in the Consumer Disputes Board which is a neutral and independent expert body whose members represent consumers and business in a balanced way. The Board's written decision is a recommendation, and the parties are not obliged to follow it. A dispute handled by the Board can always be taken to a court of law. Furthermore, the Consumer Advisory Service is a national service that provides information on consumer rights, and mediation assistance in disputes between household consumers and entrepreneurs.

The Consumer Ombudsman may assist a household consumer in an individual dispute in the court if the issue carries significant impact or the entrepreneur is not compliant with the decision of the Consumer Disputes Board. The Consumer Ombudsman may also bring group complaints to the Consumer Disputes Board or initiate class actions, for instance, against a network operator or supplier and act as the representative of the plaintiffs in a general court of law.

Individual disputes between non-household customers and businesses are solved in a general court of law or in an arbitral tribunal if agreed so.

## **4.3 Security of supply**

### **4.3.1 Monitoring balance of supply and demand**

The role of the Energy Authority in security of supply issues is to monitor the balance between supply and demand in natural gas, the quality and maintenance of networks and measures to cover the peak demand and avoid the supply shortages. The Energy Authority publishes annually a report on gas security of supply situation.

Gas import from Russia to Finland suspended in May 2022. A technical import capacity from Estonia to Finland varied between 40 and 65 GWh/day during 2022. To improve security of supply situation, Finnish gas TSO made an agreement to lease a floating LNG-terminal vessel. The vessel, which has a vaporizing capacity of 140 GWh/day started commercial operation in early 2023. The is located in Inkoo.

There's no natural gas production in Finland. Small-scale biogas is produced and injected into the gas transmission and distribution network in six different locations. There are also two off-grid LNG-terminals in Pori and Tornio, one with connection to natural gas grid in Hamina.

#### **4.3.2 Measures to cover peak demand and shortfalls of suppliers**

Natural gas users, excluding consumer customers, are primarily responsible for their own contingency planning, condition of possible backup fuel systems, backup fuel buffer stock and fuel transportation.

In case of a gas shortage situation LNG can be feed into gas network. Finnish system operator Gasgrid Finland uses mobile LNG-vaporizers and have prepared feed-in-points for LNG.

During system malfunction almost in all cases natural gas can be quickly switched to other fuels or natural gas driven generation capacity can be replaced by other generation capacity using other fuel than gas. Light and heavy fuel oil are the primary backup fuels for natural gas. In specific cases air-propane mixture and liquefied petroleum gas can be used as backup fuels too. Biogas can be used as a backup fuel as well.

If the natural gas supply is prevented over an extended period, the obligatory storages can be used too. The National Emergency Supply Agency controls for use of obligatory storages in Finland. Total volume of stockpile fuels and obligatory storages must be at least equal to cover normal consumption of imported fuels for five months.