

National Report 2018 to the Agency for the Cooperation of Energy
Regulators and to the European Commission

Finland

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1 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 37(1)(e) of the Directive for the Internal Market in Electricity (2009/72/EC) and Article 41(1)(e) of the Directive for the Internal Market in Natural Gas (2009/73/EC).

The report continues the series of annual national reports published since 2004. It covers the main steps the Energy Authority has taken, and the results obtained as regards each of the tasks listed in Article 37 of the Electricity Market Directive and Article 41 of Natural Gas Market Directive. It contains a description of the powers and tasks of the regulatory authority, an overview of the regulation and performance of electricity and natural gas sectors and an update of security of supply with regard to both gas and electricity. Focus in this report is in year 2018.

In electricity markets, the share of net electricity import decreased slightly and covered 22,8 per cent of consumption

The highest amount of electricity came from Sweden, although net imports from Sweden fell. Imports from Russia remained stable and net export to Estonia increased from year 2017. Increase in electricity consumption in 2018 was covered by increased domestic electricity generation.

Total installed generation capacity in Finland was about 17,600 MW at the end of 2018. However, all installed capacity is not available during the peak load situation.

The total available generation capacity in the peak load situation has been decreasing during past years and in winter 2018 - 2019 it was estimated to be about 11,950 MW.

The highest hourly load in 2018 was 14,062 MWh/h. During the peak load situation, the electricity system worked well and there were not any major disturbances in generation and interconnection capacities. Domestic not-running generation capacity was also available. The interconnector capacity between Finland and neighbouring countries (5,200 MW) is enough to cover the deficit in own generation capacity during the peak load situation.

The limited transfer capacity has restricted the transmission of electricity from Sweden to Finland, which is why the wholesale electricity prices in Finland were different from the prices in Northern and Central Sweden 24 per cent of hours last year. In 2018, Finland and Estonia had same price 95 per cent of hours.

Finland has been active in roll-out of smart meters and in using hourly data in balance settlement. Almost all Finnish DSOs have been trying to install smart meters to all their customers. A smart meter has been installed in over 99 per cent of consumption places.

About 10.9 per cent of electricity customers in Finland switched the electricity supplier in 2018

On 1 January 2018 the new Natural Gas Market Act came into force. According to it, Finnish natural gas market will be opened for competition on 1 January 2020. At the same time Finland will give up the granted derogations on certain provisions of the European natural gas market legislation.

The new natural gas market legislation requires ownership unbundling of the natural gas transmission system operator by the beginning of 2020

The biggest change in the natural gas market infrastructure in Finland will be the construction of the Balticconnector gas pipeline between Finland and Estonia by the end of 2019.

Balticconnector pipeline will enable integration of regional gas market between Finland and Baltic states

In 2018, the TSOs of Estonia, Latvia and Finland signed a memorandum of understanding to continue developing strong collaboration and the regional gas market. The objective is to integrate the markets of these countries so that the common entry-exit zone will be established. As a result of the separate inter-TSO compensation agreement between the Finnish, Estonian and Latvian TSOs signed in 2019, a common tariff area will be established between Finland, Estonia and Latvia. In the common tariff area entry tariffs shall be unified and the tariffs from internal border points shall be removed from the beginning of 2020.

Finland has set the target to join to the common gas balancing zone with the Baltic countries in 2022 at the earliest

In addition to Balticconnector project, there has been ongoing gas infrastructure projects to build up small-scale LNG terminals. The first off-grid natural gas LNG terminal in Finland was taken into operation on west-coast in Pori in 2016 and the second off-grid terminal in north in Tornio in 2018. The third natural gas LNG terminal on south-coast in Hamina will be connected to the local distribution grid and will be taken into operation in 2020.

In 2018, the previous downward trend in natural gas volumes was reversed and volumes rose to a level clearly above those seen a year earlier. Gas consumption was greater than a year earlier in combined heat and power (CHP) production in particular due to both a cold first part of the year and the rise in electricity market prices due to a dry summer.

Instead of being just a supervisor of the electricity and gas markets as well as the national emissions trading authority, the Energy Authority has duties also to promote renewable energy and energy-efficiency. In Autumn 2018, the Energy Authority organised the first auctions for the technology-neutral production subsidy for electricity and for the investment aid of EV charging and gas fuelling stations.

Simo Nurmi

Director General, Energy Authority

2 Main developments in electricity and gas markets

2.1 Legal framework

2.1.1 Electricity and gas market legislation

In 2018, the Finnish Government proposed new provisions to the electricity market legislation which enable implementation of a centralized data exchange (Datahub) in electricity retail markets in Finland. These amendments came into force on 1 February 2019. According to these provisions transmission system operator, Fingrid 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 also give powers to the Energy Authority to monitor and supervise that DSOs and retailers are well-prepared for the commissioning of the Datahub. Preliminary timetable for the Datahub go-live is in April 2021.

The new Natural Gas Market Act came into force 1 January 2018. According to it, Finnish gas markets will be opened for competition in the beginning of 2020. In 2018, the Finnish Government proposed amendments to the Natural Gas Market Act which give power to the Energy Authority to approve entry and exit charges in interconnection points (Balticconnector and Imatra) for years 2020 and 2021. These amendments came into force on 1 March 2019.

2.1.2 Other electricity and gas market related political issues

In November 2016, the Finnish Government published the National Energy and Climate Strategy for 2030¹. It outlines the actions that will enable Finland to attain the targets specified in the Government Programme and adopted in the EU for 2030, and to systematically set the course for achieving an 80–95 per cent reduction in greenhouse gas emissions by 2050.

The strategy outlines that with minor exceptions, Finland will phase out the use of coal for energy production by 2030. The minimum aim is to have 250,000 electric and 50,000 gas-powered vehicles on the roads. The electricity market will be developed at the regional and the European level. The flexibility of electricity demand and supply and, in general, system-level energy efficiency will be improved. Technology neutral tendering processes will be organised in 2018–2020, on the basis of which aid will be granted to cost-effective new electricity production from renewable energy.

In 2018, the Finnish Government proposed 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. The Energy Authority is responsible for supervising that provisions set in the Act are followed. The new Act came into force on 1 April 2019.

In September 2016, the Ministry of Economic Affairs and Employment established a working group to explore smart grids' potential for the electricity market. Its goal is 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 working group published in October 2017 an interim report and the final report

¹ Available from <https://tem.fi/documents/1410877/2769658/Government+report+on+the+National+Energy+and+Climate+Strategy+for+2030/0bb2a7be-d3c2-4149-a4c2-78449ceb1976/Government+report+on+the+National+Energy+and+Climate+Strategy+for+2030.pdf>

with proposals in October 2018². The Government will continue implementation of the proposals together with the implementation of the provisions of the Clean Energy Package.

The Act on Production Subsidy for Electricity Produced from Renewable Energy Sources was amended in June 2018 with a technology-neutral production subsidy for electricity based on auctioning process. The Energy Authority organised during autumn 2018 the first auction of maximum annual electricity generation of 1.4 TWh. After the auction, seven projects (all wind) were awarded and the average price premium of accepted tenders was EUR 2.5 per MWh.

2.2 Electricity market

2.2.1 Unbundling

Development in TSO unbundling and certification of TSO

In 2018, 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.

Development in DSO unbundling

Total number of distribution system operators having lower than 110 kV voltage level network was 77 at the end of 2018. Further, there are 11 high-voltage distribution system operators having only 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.

Totally, 36 distribution system operators were in 2018 over the threshold value. In addition, some other distribution system operators have voluntarily legally unbundled network activities. At the end of 2018 a total of 48 distribution system operators 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 2018 these requirements were applied to 17 distribution system operators in Finland.

2.2.2 Wholesale market

Development in market integration

The Finnish electricity wholesale market is a part of the North European power market. Finland forms an integrated wholesale electricity market with other Nordic and Baltic states. The Nordic market has been price coupled with the North Western European electricity market since 2014. In June 2018, the first wave of a common European Cross-Border Intraday-solution, XBID was launched and Finland was included in it.

At the end of 2018, the interconnection capacity from the other Nordic countries, Russia and Estonia to Finland amounted to around 5,116 MW. In 2018, there were no changes in the interconnection capacity.

² Final report is available from <https://tem.fi/en/working-group-to-explore-smart-grids-potential-for-the-electricity-market>

Development in market concentration

During past few years, the most significant change in the structure of the Finnish electricity wholesale market and in the development of market concentration has been the closure of condensing power plants of large power producers. At the same time, quite many wind power plants have been built. Some new companies have come into the market while the share of the biggest companies has decreased a bit. The new companies and power plants are mainly related to wind power.

The Finnish electricity generation sector is characterized by a large number of actors. The total number of companies producing electricity has raised a bit to some 150 and the number of production plants was circa 400.

Development in electricity generation and consumption

In electricity markets, the share of net electricity import covered nearly 23 per cent of consumption in 2018. The highest amount of electricity came from Sweden, although imports from Sweden fell slightly compared to the previous year. Imports from Russia remained stable. Net export to Estonia increased by 32 per cent.

Finnish electricity production amounted to a total of 67.5 TWh in 2018. Finnish hydropower production accounted for 15 per cent of the total electricity consumption, while the rate for nuclear power production was 25 per cent. CHP accounted for 24 per cent of Finland's total electricity consumption. The share of wind power increased to 7 per cent.

Electricity consumption in Finland increased slightly in 2018. The total electricity consumption was 87.4 TWh. The combined share of housing, agriculture, services and construction from the total electricity consumption was 50 per cent last year, while industry accounted 47 per cent of the total Finnish consumption.

Capacity allocation

In 2018, there were no changes in the capacity allocation model. Congestions across the borders are managed by implicit auctions in the day-ahead market. Remaining transmission capacity after day-ahead allocation is provided for intraday market and balancing.

Finland is considered as a single bidding zone and internal congestions and congestions after the day-ahead market closure are managed by countertrade.

Development of trading in power exchanges

In December 2015, the Energy Authority designated pursuant to Article 4 of the CACM regulation (2015/1222) Nord Pool AS to act as a nominated electricity market operator in Finland. In January 2016, EPEX SPOT SE announced to the Energy Authority its interest to start offering day-ahead and intraday trading services in Finland. In January 2019, also NASDAQ Oslo ASA announced to the Energy Authority its interest to start offering day-ahead trading services in Finland. Necessary multi-NEMO arrangements are still under development and thus in the end of 2018 only Nord Pool AS was offering day-ahead and intraday trading services in Finland.

In 2018, the volume of electricity traded in Nordic and Baltic day ahead markets increased to 396 TWh, and in the intraday market the volume was 8.3 TWh (includes also Nord Pool intraday trading in Germany).

The share of power bought through power exchange in bidding zone Finland was 70 per cent of total Finnish electricity consumption in 2018. The share was about at the same level as in 2017.

Development of wholesale prices

In 2018, the average system market price in Nordic area was 50 per cent higher than in 2017. The average system price in 2018 was EUR 43.99 per MWh. In 2018, the average price in the

bidding zone Finland was EUR 46.80 per MWh, showing an increase of 41 per cent year-on-year. This price increase was mainly due to dry summer and autumn 2018 in whole Nordic area and remarkable price increase of CO2 allowances.

2.2.3 Retail market

Development in market concentration

In 2018, there were no major changes in the number of retail suppliers. To serve Finland's circa 3.5 million electricity customers, there are 72 retail suppliers of which 55 offered in 2018 their products nation-wide.

Electricity retail market in Finland is quite competitive. The Energy Authority has estimated that at the end of 2018 there were three electricity retailers having larger than five per cent market share in electricity retail market. The market share of the three largest companies in the retail market for small and medium-sized customers has been estimated to be 35-40 per cent. The Energy Authority has estimated that the Herfindahl-Hirschman index (HHI) to measure market concentration in electricity retail market is round 600 – 700 showing competitive marketplace.

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. At the end of 2018, there were 11 fully independent electricity retailers³. These retailers had about 35 per cent of electricity retail customers in Finland.

Development in supplier switching

The rate of supplier switching among electricity users slightly decreased in 2018. A total of 10.9 per cent of electricity users switched their supplier during the year. Switching rate has been about 10-12 per cent a couple of years.

Development of retail electricity prices

In January 2019, household consumers paid on average 10.1 percent more for their electricity than in January 2018, whereas for electrically heated households the increase was 10.7 percent.

Increase in the wholesale electricity prices were also reflected in the retail prices of electrical energy. The obligation to supply price of electrical energy for households increased by 17.5 per cent on average over the course of the year 2018. For two-year fixed-term contracts average price increase was 44.1 per cent.

The electricity distribution price including taxes was 4.9 per cent more expensive for household consumers and 3.8 per cent more expensive for electrically heated households at the beginning of 2019 than at the beginning of 2018.

Development in supply contracts

Roll-out of smart meters to nearly all electricity customers and the use of hourly measured consumption data in balance settlement have made possible for electricity supplier to offer all customers dynamic electricity price contracts where electricity price for an end-user is bound e.g. to the hourly prices at the day-ahead spot market. At the end of 2018, about 9 per cent of retail customers in Finland had such supply contract.

The most common type of supply contract is an open-ended contract which was chosen by about 49 per cent of retail customers in Finland. About 41 per cent of customers had a fixed term contract at the end of 2018.

³ 'Fully independent retailer' means a retailer which does not belong to the same group of company of any Finnish electricity distribution network operator or is not owned by one or several Finnish electricity distribution network operators.

Promotion of retail competition

To promote retail competition the Energy Authority has maintained since 2006 a web-based price comparison tool to facilitate supplier switching and, in general, to increase customers' awareness on electricity prices. The price comparison tool is also developed to inform household consumers better about the origin of the electricity. All retail suppliers are obligated to maintain up-to-date information on their public electricity price offers on this tool. On average about 150,000-200,000 price comparisons with this tool has been made per month. Energy Authority is renewing the price comparison tool to better fulfil customers' needs and the new price comparison tool will be launched in 2019.

According to the Electricity Market Act, Fingrid has a task to develop the exchange of information required for electricity trade and imbalance settlement. New provisions to the Electricity Market Act came into force in February 2019, which oblige Fingrid to develop and provide centralised information exchange system services for the electricity retail market, a Datahub. The datahub has been planned to be in operation in April 2021.

Retail market integration

Since 2005, Nordic energy regulators have been working to promote and facilitate a common end-user market for electricity in Finland, Denmark, Sweden and Norway. In October 2009, Nordic ministers for energy expressed their political support to the initiative to establish a common Nordic end user market. The Energy Authority has actively continued working towards that target.

NordREG, the cooperative organisation for Nordic regulatory authorities, has prepared several recommendations for the Nordic ministries to facilitate the establishment of a single Nordic electricity retail market. However, implementation of the recommendations in the various Nordic countries and the establishment of a common Nordic retail market are ultimately dependent on national political decision-making. In 2018, NordREG conducted a study to explore the customers' views and experiences of the four Nordic electricity markets in Denmark, Finland, Norway and Sweden.⁴

2.2.4 Infrastructure

Development in transmission network investments

Fingrid has developed the internal transmission system significantly to increase the capacity of the main transmission corridor in North to South direction. Increasing market integration and intermittent generation demands flexibility not only from generation but also from the transmission system.

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 is included in the European PCI-list.

Roll-out of smart meters

By the end of 2018 more than 99 per cent of consumption places in Finland had already a smart meter. Metered hourly consumption data is used for the balance settlement, including also households, in Finland.

⁴ Final report is available from <https://www.nordicenergyregulators.org/publications/publications-2018/>

2.2.5 Security of Supply

Development in competences of NRA for security of supply

In 2018, there were no changes in competences of the Energy Authority regarding monitoring security of supply.

The Capacity Reserve Act came into effect in March 2011. The peak load reserve capacity will be used as a strategic reserve to ensure that the balance between supply and demand is achieved only if the balance will not be achieved in commercial market. According to Capacity Reserve Act the Energy Authority evaluates and decides the required size of peak load reserve capacity and arranges an open tendering process in order to choose which power plants and consumption units capable for demand response would be accepted to the capacity reserve arrangement.

The current strategic reserve capacity period started in July 2017 and it will last until end of June 2020. The capacity, 729 MW, consists of power plants (707 MW) and facilities able to demand side flexibility (22 MW).

Development in generation investments

In 2018, there was no significant change in total electricity generation capacity in 2018. The changes were only power output increases in existing power plants. No new capacity was commissioned.

The most significant ongoing generation investment project in Finland is the construction of nuclear power plant unit Olkiluoto 3. Building of this 1,600 MW unit has been delayed for several years. Originally, the new unit should have been commissioned by the end of 2009. According to the latest estimates, it will be in operation early 2020.

The Energy Authority organised during autumn 2018 the first auction of technology neutral RES support. After the auction, seven projects (all wind) were awarded and the average price premium of accepted tenders was EUR 2.5 per MWh. In addition to these projects, in 2018 some project promoters announced start of building wind power plants based on PPAs without any public support.

Fennovoima Oy is planning to construct a new nuclear power plant unit in Pyhäjoki. The project has received a decision-in-principle from the Finnish Government and the Parliament in 2014. The project is still preparing material for the construction license granted by the Government after obtaining favourable opinion from the Radiation and Nuclear Safety Authority. The unit will be 1,200 MW and according to the original plans it would be in operation in 2024.

At the end of 2018, there was about 120 MW of network connected solar generation capacity. Total capacity was increased by 82 per cent in 2018.

Development in supply and demand balance

The Energy Authority has estimated, that Finnish electricity generation capacity will not be able to cover demand during peak load situations. The resulting capacity deficit must be covered by importing electricity from other countries.

Based on information submitted by power plant operators to the Energy Authority, total installed power generation capacity in Finland was about 17,600 MW at the end of 2018. However, the entire capacity is not available during the peak load periods. The Energy Authority has estimated in autumn 2018, that about 12,000 MW of Finnish electricity generation capacity (incl. peak load reserves) was available for the consumption peaks in winter 2018–2019.

The highest hourly load, 14,062 MWh/h was reached in February 2018. It was highly affected by outside temperature and length of cold spell. The Energy Authority has estimated that the

capacity requirement covered by electricity imports was around 3,400 MW at its highest peaks during the winter of 2018–2019.

The electricity import capacity is around 5,200 MW. The highest hourly net import was 4,223 MWh/h in January 2018. During the same hour domestic electricity production was 8,839 MWh/h.

2.2.6 Regulation

Network regulation

Since the end of 2004, Finland has applied the ex-ante regulation of network pricing as required by the current Electricity Directive. 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.

In 2018, the Energy Authority published annual report on technical and economical development of Finnish electricity network business and on impact assessment of the network regulation since 2008⁵. Special focus of this report was on period 2012 - 2017.

2.3 Gas market

2.3.1 Unbundling

In 2018, there were no changes in the unbundling regime of natural gas operations. Finland has availed itself of the possibility of an exemption allowed by the Natural Gas Market Directive and thus there is neither legal nor operational unbundling of natural gas transmission network operation. However, according to the new Natural Gas Market Act Finland will end-up derogation in the beginning of 2020 when gas markets in Finland will be opened for competition.

The gas transmission system operator, Gasum Oy is a fully state-owned and vertically integrated company which is also the only importer and wholesale supplier of gas in Finland. Based on the new Gas Market Act, the gas transmission system operator shall be ownership unbundled by using so-called TSO-model by the beginning of 2020.

Approximately 80 per cent of the Finnish gas DSOs are wholly or mainly owned by municipalities. The rest 20 per cent of the DSOs are owned by industrial users of natural gas or by private investors. None of the Finnish gas DSOs have more than 100,000 customers. There is no specific requirements for legal unbundling of gas DSOs.

2.3.2 Wholesale market

Development in market integration

The natural gas market in Finland is relatively isolated and small. Finland has at the moment natural gas pipeline connection only to the Russian Federation. The only one importer and wholesale supplier, Gasum Oy also owns and operates the natural gas transmission network.

In October 2016, Finnish Baltic Connector Oy and Estonian Elering AS made decisions to build up the Balticconnector gas pipeline between Finland and Estonia by the end of 2019. The new pipeline would allow development of a regional gas market in Finland and Baltic states and further market integration towards Europe.

In February 2019, the TSOs of Finland, Estonia and Latvia signed an ITC contract defining the terms under which the TSOs may use each other's networks for transiting gas within the region.

⁵ Available from https://energiavirasto.fi/documents/11120570/12862527/Vaikuttavuusraportti_2018_.pdf/5af13df5-0112-13cd-8421-e457ab562449/Vaikuttavuusraportti_2018_.pdf.pdf (in Finnish)

As a result of the ITC agreement, a common entry-exit tariff area will be established between Finland, Estonia and Latvia. In the common tariff area entry tariffs shall be unified and the entry/exit tariffs from internal border points shall be removed from the beginning of 2020. Finland has also set the target to join to the common gas balancing zone with the Baltic countries in 2022 at the earliest.

Lithuania, that has been part of the project since the beginning, was not prepared to sign the contract at this time but is expected to join later.

Development in gas markets

The previous downward trend in natural gas volumes was reversed and in 2018 volumes rose to a level clearly above those seen a year earlier, totaling 24.7 TWh and up 11 per cent year on year (2017: 22.3 TWh). Gas consumption was greater than a year earlier in combined heat and power (CHP) production in particular. This was partly attributable to both a cold first part of the year and the rise in electricity market price due to a dry summer. At present, natural gas is imported into Finland only from Russia. In addition to the natural gas imported from Russia, biogas produced in Finland is supplied to the natural gas transmission network.

Large end-users account about 98 per cent of the natural gas consumption in Finland. Energy and power companies used about 38 per cent of gas in CHP, district heat and power production. Large industrial end-users consumed about 60 per cent of total gas consumption in Finland. The key industrial sectors were forest and chemical industries whose consumption corresponded. Natural gas accounts for around 5 per cent of Finland's total energy consumption. In 2018, there were no significant changes in the number of market actors.

Development in natural gas prices

The wholesale supply of natural gas to the large Finnish end-users and retailers is based on cost based contracts between Gasum Oy and the customers. Customers buy natural gas from Gasum Oy based on a public tariff.

The total wholesale price of natural gas, including transmission and natural gas energy, increased by an average of 10 per cent during the course of 2018.

The price for natural gas energy excluding taxes increased by 15 per cent between January 2018 and January 2019. The price of natural gas energy is index-linked to the price of heavy fuel oil and the price of imported coal, as well as to the domestic energy index.

Natural gas transmission price remained stable in 2018.

On natural gas market in Finland, only natural gas users with a consumption of more than 5 million cubic meters and with remote metering can trade in the secondary market with the gas that they have acquired for their own use or retail. Additionally, Gasum Oy offers short term products that are sold on the secondary market operated by Kaasupörssi Oy, which is a subsidiary of Gasum Oy. Total trading amounted to 1.1 TWh or about 40 per cent more than during the previous year. Secondary market trading of these were 461 GWh. Total traded volume was 4.3 per cent of the total Finnish consumption of natural gas in 2018.

2.3.3 Retail market

Development in market concentration

The retail supply of natural gas covers only about 8 per cent of the total consumption. In Finland, there are only about 23,200 customers in the natural gas market. The largest customer segment, (about 16,400 customers) consists of households who buy natural gas for cooking. However, the total natural gas consumption of this segment amounts to only 0,3 mcm (0.015 per cent of total consumption).

At the end of 2018 there were 24 natural gas DSOs.

Many of the natural gas retailers in Finland are relatively small having only dozens of customers. The share of the top three retail suppliers is about 50 per cent of the total natural gas consumption in the retail level.

Development in supplier switching

Supplier switching in the Finnish natural gas retail market is not yet possible.

Finnish gas market will be opened for competition on 1 January 2020. After that customers may switch his/her gas supplier provided that the customer has a remotely readable meter installed in the consumption place.

2.3.4 Infrastructure

In October 2016, Finnish Baltic Connector Oy and Estonian Elering AS made decisions to build up the Balticconnector gas pipeline between Finland and Estonia by the end of 2019. In the summer of 2019 the offshore part of the pipe is being laid, and the onshore part and the compressors are being constructed.

In September 2016, the first small-scale off-grid LNG terminal in Finland was taken into operation on the west-coast in Pori. In 2018, the second off-grid LNG terminal in Tornio (north) was also taken into operation. These LNG-terminals will serve mainly local industrial users, maritime of use LNG and LNG trucks.

There is also one ongoing project to construct a small-scale LNG terminal on the south-coast of Finland in Hamina. This terminal will be connected to the local distribution network.

2.3.5 Security of Supply

Natural gas used in Finland is imported from Russia. There is no natural gas production in Finland. The importing capacity from Russia is estimated to be about 8,000 MW. Peak load was 7,500 MWh/h in 2018. There were no new transmission lines built during the 2018. Part of the double transmission line (DN700) has been removed from use in 2018. The capacity of Balticconnector -pipeline between Finland and Estonia will be about 3,000 MWh/h.

Small-scale biogas is produced and injected to the gas transmission network in four different locations. Biogas production capacity connected to transmission network was approximately 130 GWh/a at the end of 2018.

In addition, propane can be produced indigenously as it is the only gas to be stocked in small amounts for immediate substitute for the possible lack of natural gas.

2.3.6 Regulation

Network regulation

In the natural gas sector, there are 24 local distribution network operators and one transmission system operator. The Balticconnector pipeline is promoted on the Finnish side by a specific project company Baltic Connector Oy.

The Energy Authority is responsible for regulating natural gas distribution network operators and natural gas transmission network operator. Additionally, the Energy Authority is supervising the wholesale and retail supply activities of the operators as Finnish gas markets are not opened for competition.

In November 2015, the Energy Authority confirmed with its decisions the methods concerning the rate of return in natural gas network operation to be followed during the third and fourth regulatory periods in 2016 – 2019 and 2020 - 2023.

Supervision of natural gas prices

As there is no gas-to-gas competition in the Finnish gas markets, every natural gas supplier has an obligation to supply. Supplier may set their prices by themselves without any ex-ante approval by the regulator nor any other authority. However, based on the legislation, supply tariffs under obligation to supply should be reasonable.

In 2018, Energy Authority did not make any decisions on reasonableness of natural gas supply prices.

2.4 Consumer protection and dispute settlement

The Finnish Competition and Consumer Authority and the Consumer Ombudsman are in general responsible for consumer protection and ensure that the practices companies use in marketing and their customer relations are appropriate and the contract terms are reasonable. Individual contractual disputes between consumers and energy companies are handled by consumer rights advisors and the Consumer Disputes Board.

The Energy Authority monitors the transmission system operators', distribution system operators' and suppliers' overall compliance with the electricity and natural gas market legislation.

In 2018, the Energy Authority received 27 new requests for investigation related to electricity system operators and retailers. In addition to these, the Energy Authority opened on its own initiative 13 new investigations concerning electricity system operators and retailers. In 2018 the Energy Authority made decision or closed the investigation in 31 cases. Some of these cases were already received in previous years.

Regarding the natural gas markets, the Energy Authority did not receive any requests for investigation and make any decisions during 2018.

However, 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 submitted fell into the following categories: connection charges, the network tariffs, quality of supply, metering, inconsistencies in invoicing and general complaints regarding practices of the distribution system operators and suppliers.

3 Electricity market

3.1 Network regulation

3.1.1 Unbundling

TSO unbundling and certification

Finland has chosen so-called TSO-model for unbundling of electricity transmission system operators. 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 9 of the Electricity Directive. According to the national legislation, transmission system operator shall own transmission network it operates.

Transmission system operator, Fingrid Oyj was established in November 1996 by joining two previously existing transmission network operators. It started its operations in September 1997. Fingrid owns the Finnish main grid and all significant cross-border connections.

In 2018, there were no changes in the ownership structure of Fingrid. Majority (53.14 per cent) of Fingrid's shares are owned by the State of Finland and the National Emergency Supply Agency. Rest of shares are owned by Finnish financial and insurance institutions.

The Energy Authority gave the final decision on the certification of Fingrid in March 2014. The certification decision was conditional as the Energy Authority required that by the end of 2016 one minor owner of Fingrid should have given up his rights in Fingrid's decision making. The Energy Authority approved by decision in December 2017 actions made to fulfil these requirements.

Development in DSO unbundling

According to the Electricity Market Act, 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.

Totally, 36 distribution system operators of 77 were at the end of 2018 over the threshold value. Some distribution system operators under this threshold value have voluntarily legally unbundled network activities from electricity supply and generation activities. At the end of 2018, 48 distribution system operators were legally unbundled.

The legally unbundled distribution system operators are not required to be structured in any special legal form. The only limitation is that the separated companies cannot both be public utilities because then these companies would be part of the same legal entity.

Many of the distribution system operators have been either municipal utilities or companies in which the majority of the shares are owned by municipalities. There are no requirements for ownership unbundling of the DSOs. Most of the legally unbundled distribution system operators still belong to same group of companies as electricity retailers and/or generators. In many cases the parent company of a legally unbundled distribution system operator is a generating or retailing company. On the other hand, some electricity retailers are owned by a group of distribution system operators. In most cases the legally unbundled distribution system operators belonging to a group of companies have shared services with the company group. These most often include brick and mortar offices, managerial, and financial responsibilities. There are also available independent service providers for the construction and maintenance of the network. Some electricity system operators have outsourced part of their operational tasks to these service providers.

Majority of the electricity system operators have the economic ownership of the assets. However, there are some electricity system operators who are operating with leased out network assets and thus they don't have the economic ownership of their network assets. In addition to these there are some other DSOs whose network assets are partially leased, like some substations. Regardless of whether the electricity system operator has or doesn't have the economic ownership of the assets, it needs to fulfil the technical, economic and organisational preconditions for the electricity system license:

- The organisation of the applicant corresponds to the scope and nature of its system operations;
- The applicant has a sufficient staff in its service;
- The applicant has in its service an operating manager and, if the applicant carries out electrical works, a manager of electrical works, that meets the eligibility requirements laid down in or by virtue of the Electrical Safety Act (410/1996);
- The applicant has the economic conditions for profitable electricity system operations;
- The applicant has the right to decide on the resources needed for the operation, up-keep and development of an electricity system; and
- The grid operator to be placed under the systems responsibility has delegated the functions related to the national balance responsibility to its separate operational entity or a subsidiary wholly owned by it.
- The applicant has unbundled electricity distribution network operations from other operations or electricity transmission operations.

The fifth point is comparable to the Article 26(2)(c) in the Directive 2009/72/EC. The corresponding principle has been de facto applied in Finland established practise of granting an electricity system license since year 1995. Besides these requirements, any additional rules that would provide the electricity system operators with more financial independence are not required. There isn't for example any formal restriction preventing that cash flow (e.g. in the form of dividends or transactions) of electricity distribution system operator can be used by the holdings. The functional unbundling requirements are applied to legally unbundled distribution system operators with some limitations, with the exception of the requirement in the article 26(2)(c), which is applied to all distribution system operators.

The functional unbundling requirements are applied only to legally unbundled distribution system operators because the requirements are related to the legal organs of the company (the board of directors and the managing director) and are not therefore applicable to vertically integrated company. In practice, the distribution system operators need to be first legally unbundled before the functional unbundling requirements are applicable.

The requirement for separate management for the electricity network company is applied to legally unbundled system operators with 50,000 customers or more. At the end of 2018 it covered 17 distribution system operators in Finland. According to Electricity Market Act, a person managing a network operator engaged in a legally unbundled electricity network operation with 50,000 customers or more may not act as the managing director of a utility in charge of electricity generation or electricity supply or as a member of its board of directors or a corresponding organ, if the network operator and the utility are under the control of the same party. The threshold of 50,000 customers is lower than the directive requires.

The requirements for professional interests and compliance programs are also applied to legally unbundled electricity system operators with 50,000 customers or more. The ministerial degree, which sets the detailed content of the requirements, was updated in fall 2013. The Energy Authority has prepared and published a recommendation for compliance program.

The accounting unbundling requirement is applied to the electricity system operators, which are not required to be legally unbundled. The accounting unbundling is also required in the legally unbundled companies, which have other activities besides 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 EUR 500,000 and the share is less than 10 per cent of the company's total revenue. Accounting unbundling requirements are specified with the ministerial degree. The Energy Authority has issued guidelines on the compilation of unbundled financial statements. These guidelines are not legally binding but they show the procedure the Energy Authority considers fulfilling the requirements of the legislation.

Both the distribution system operators and the transmission system operator are under the obligation to publish unbundled financial statements with certain formula as a part of the statutory financial statement, annual report or corresponding other public document available to the stakeholders.

The unbundled income statements, balance sheets and any supplementary information of unbundled operations are audited as part of the statutory auditing. The Energy Authority has issued the guidelines in co-operation with chartered accountant on the auditing of unbundled financial statements. These non-binding guidelines aim to help the audit of unbundled financial statements in different electricity system operators and inform the auditors about the unbundling requirements.

Even if there are legally unbundled distribution system operators, many of them still have the same corporate presentation with the electricity supply and generation activities. Obligations regarding communication and branding of the DSOs were implemented in the Finnish regulation in fall 2013. The Electricity Market Act sets obligations to legally unbundled electricity system operators to ensure that its brand separates from those in the same group of companies as electricity retailers and/or generators and that it appears in communication with its own identity.

3.1.2 Technical functioning

Balancing services

The Nordic countries have established common regulation power market in the year 2002 to handle balancing. Imbalances are handled and settled according to common rules defined in System Operation Agreement between the Nordic TSOs. Balancing is managed within the Nordic control areas as one system consisting of all four Nordic TSOs. The balance management is based on frequency requirements agreed on the System Operation Agreement. However, imbalances within a country are settled according to principles that vary from one country to another.

Figure 1 presents the balance management in the context of the Nordic electricity market model. Besides the regulation power market for actions during the specific operating hour, Elbas-market can be used for the intra-day trading and revisions of nominations after the day-ahead spot market (Elspot) has closed.

Physical market Power transactions		Specific operating hour	Balance settlement
ELSPOT	ELBAS	Regulation power market	Balance energy
12 - 36 h	1 - 32 h		max 3 months
Bilateral transactions		Balance management	Power balances of the parties

Fixed transactions must be agreed and reported before the specific operating hour

Figure 1 Balance management in the Nordic electricity market model (Source: Fingrid Oyj).

In the Nordic regulation power market, all bids are collected in the joint Nordic merit order list and according to this list the production increases and decreases are carried out where they are most advantageous in the price order, however, taking into account congestions between control areas. This leads to the effective utilisation of the Nordic balancing resources.

The balance between production and consumption within a specific operating hour is created through the regulation market by the upward and downward regulation of production and consumption to handle physical imbalances taking into account the effects on congestions.

The price of the regulation power during the specified operating hour (the imbalance settlement period in Finland is 60 minutes) is determined based on ordered up- or down-regulations. This implies that the price of the regulating power is known only after the end of the specific operating hour. It has been agreed, that the price of up-regulation is the most expensive up-regulation bid ordered by the TSO during the specific operating hour. All those who have participated in the up-regulation during the specific operating hour receive the same compensation per MWh. Respectively the price of down-regulation is the cheapest down-regulation bid ordered by the TSO during the specific operating hour. All those who have participated in the down-regulation during the specific operating hour receive the same compensation per MWh.

The TSO provides information on forecasts and values for the reserves before, during and after the operating hour and also regulation prices after the operating hour. Most of this information is given only to the market participants and to Nord Pool. Publicly available information can be found on Fingrid's website www.fingrid.fi and Nord Pool's website www.nordpoolgroup.com.

The Finnish, Norwegian and Swedish TSOs decided in 2012 to implement a harmonised Nordic Balance Settlement model at TSO level. The implementation includes harmonising and integration of national grid and bidding area level balance settlement. A common operational unit, eSett Oy responsible for imbalance settlement and invoicing of the Balance Responsible Parties in Finland, Sweden and Norway is jointly owned by the Finnish, Norwegian and Swedish TSOs. The project's goals have been firstly to provide similar operating conditions to all balance responsible parties despite the area and country, secondly to offer balance settlement in similar principles to all market participants through one unit and thirdly to create common rules and standards for data exchange in cooperation with other actors in the electricity market. The go-live for the common Nordic Balance Settlement was on May 1, 2017.

European Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing 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. However, in March 2019 Nordic TSOs announced that TSOs have identified risk of delay in the implementation of 15 min imbalance settlement period in the Nordics by December 2020.

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 in order 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. According to the TSOs' plans, the 1st generation of NBM will contain:

- Nordic aFRR capacity market
- Nordic mFRR capacity market
- Single price model
- 15 minutes time resolution
- mFRR balancing process automation (including changes to the mFRR energy activation market)
- Data & transparency

The 2nd generation of NBM will contain:

- European mFRR Standard product
- aFRR energy activation market with European standard product
- Full mACE model implementation

Quality of service and supply

According to the Finnish legislation, the electricity system operators have various obligations:

- obligation to develop the electricity network;
- obligation to connect; and
- obligation to transmit electricity

Since September 2013, the legislation has also included obligations for DSOs to plan and develop their network with aim to restrict storm related interruptions to 36 hours in rural areas and 6 to hours in urban areas gradually by the end of 2028. 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.

DSOs had to submit by 31 December 2017 to the Energy Authority a request of delay to fulfil these obligations if they have found substantial reasons for it. In June 2019, the Energy Authority granted delay to fulfil these obligations until end of 2032 for two DSOs and until end of 2036 for eight DSOs.

In addition to this, also the regulation model provides incentives system operators to improve the quality of electricity in two ways: by taking into account network investments in the regulated asset base and by treating the losses caused to customers by interruptions as items comparable with costs.

The Energy Authority has not set specific targets for electricity quality improvement. The outturns required from system operators must be equal to the average outturns of previous years. However, the regulation model provides incentives to system operators to improve the quality of electricity supply, because by having fewer and shorter interruptions compared to average level of previous years the system operator will have also higher rate of return. Similarly, electricity quality impairment lowers the permitted rate of return for the system operator.

Table 1 shows interruptions in transmission and distribution networks during the years 2008-2018. The numbers include both planned and unplanned interruptions. In Finland, storms and other circumstances caused by weather or animals have a remarkable influence on interruptions because about 68 per cent of MV distribution network are overhead lines. Thus, annual variations in interruption times may be significant.

Table 1. Interruptions in transmission and distribution networks in 2008-2018.

	Interruptions minutes lost per customer per year										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Transmission	1.6	2.7	5.0	6.9	1.3	2.3	8.3	2.0	1.4	2.1	12.0
Distribution	89	62	143	343	94	186	80	170	81	70	63

The Electricity Market Act states, that the DSOs shall pay standard compensations to the customers if the interruption time is 12 hours or more. If the interruption time is at least 12 hours, the standard compensation is 10 per cent of the customer's annual network access charges. The compensation increases stepwise with the interruption time. The maximum compensation is 200 per cent of the annual network charges when the interruption time has exceeded 12 days. Maximum compensation per incident rose to EUR 2,000 on January 1, 2018.

In 2018, due to interruptions of 12 hours or more electricity distribution system operators have paid as standard compensations total amount of EUR 2.3 million (2017: EUR 4.9 million) to about 22,900 customers (2017: 36,800 customers).

Monitoring time to connect

The Energy Authority has not collected statistics on actual time to connect consumers and producers. Actual connection date and time is agreed between network system operator and customer when they are making the connection agreement.

If the connection of consumer to the network is delayed from the agreed connection date and time, customer has right to abstain from paying connection charge until the connection has been done. Furthermore, if the connection has been delayed from the agreed the customer his right to receive a standard compensation which is 5 per cent of the connection charge during the first two weeks and after that 10 per cent per week. Maximum amount of standard compensation is 30 per cent of the connection charge and EUR 3,000.

The Energy Authority has not collected information in how many cases and how much network system operators have paid standard compensation due to delays in connecting customers.

Monitoring safeguard measures

In 2018 there has not been any incidents in Finland, which would have required to implement safeguard measures as defined in Article 42.

RES regulatory framework

In Finland, there are no priority for RES connections. However, the regulation states, that connection charges for small-scale electricity generation (production capacity up to 2 MVA) may not include costs related to reinforcements of existing network. Furthermore, the regulation requires,

that network charges for input of electricity production to distribution networks shall be based on amount of energy and may not exceed on annual average 0.07 cent/kWh (excluding taxes). These requirements are not restricted to RES power generation.

RES does not have priority access according to the Finnish electricity market legislation. In Finland RES producers like any other electricity market actors are also responsible for their power balance.

In Finland, RES support in form of a feed-in tariff is available for wind power plants, biogas power plants (gas produced by digestion), wood-fuelled power plants which also produce heat for utilization and timber chip power plants. The feed-in tariff for wind, biogas and wood fuel power plants comprises the target price less the three-month average price of electricity in day-ahead market in the Finnish bidding zone. The target price is EUR 83.50 per MWh. The feed-in tariff payable to timber chip power plants is determined according to the three-month average price of emission rights and the energy tax on peat.

The feed-in tariff paid in Finland comprises a state subsidy granted by the Energy Authority. Electricity producers that receive the feed-in tariff are responsible for selling to the market electricity they produce and any arising net energy costs. The feed-in tariff is applied for from the Energy Authority in three-month periods in arrears.

The regulation has set a quota of 2,500 MVA for maximum total amount of wind power capacity that could be approved to the feed-in tariff system. Amount of wind power capacity in applications sent to the Energy Authority has already exceeded this amount.

In November 2017, the Finnish Government gave to the Parliament a proposal for amending Act on Production Subsidy for Electricity Produced from Renewable Energy Sources. The amended act was approved by the Parliament in May 2018. The act outlined the procedure for auctions for RES support. In 2018 the first auction was organized by the Energy Authority. A feature of the auction was to facilitate competition between different generation technologies. Eligible technologies were wind power, biogas, combined heat and power from forest biomass, solar and wave. Hydro power was excluded. In contrast to other recent technology neutral auctions in Europe, such as Germany (April 2018 and November 2018) and Denmark (November 2018), the bid volume in generation (MWh) and not in capacity (MW). The auction was oversubscribed by a factor of 3. Only bids from onshore wind were received. The volume weighted average of the accepted premiums was EUR 2.52 per MWh. For the accepted bids, the price ranged from EUR 1.27 to 3.97 per MWh.

3.1.3 Network tariffs for connection and access

Regulation of network tariffs for connection and access

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. 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 in its supervision decisions for the 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 include obligations to return to the customers any surplus profit for the completed regulatory period through lower network charges for the new regulatory period. The supervision decisions correspondingly confirm that the network operator may allow raise network charges for the new regulatory period, with the amount by which the earnings accruing to the network operator from the previous regulatory period fell below the reasonable earnings level.

According to the Act on Supervision of Electricity and Gas Markets the methodology confirmed by the regulator may include the following items:

- method for the valuation of regulated asset base
- method for determining approved rate of return on capital
- method for determining realised profit of network operations
- method for setting efficiency targets for network operations

The network will be included into the regulated asset base in the net present value instead of book value. Ever since the first regulatory period, the Energy Authority has encouraged system operators to make investments in the electricity network. In the regulation model, all investments in the network will annually be taken into account in the regulated asset base, which is used to determine the reasonable rate of return. Thus, the methodology provides incentives to transmission and distribution system operators to develop and to make necessary investments into their network in order to ensure viability of the networks as required by the Article 37(6)(a). The net present value of the network will be updated annually. Approved rate of return on capital is determined using a WACC-model (Weighted Average Cost of Capital).

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 Energy Authority has also developed details of the methodology with a view to achieving a regulatory model that is incentivizing more innovations and investments 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 give him/her a comprehensive and sufficiently detailed estimate on the costs of connection. The Energy Authority has fixed in January 2011 by its decisions the methodology for pricing of grid connections in distribution networks.

3.1.4 Cross-border issues

Capacity allocation and congestion management

Congestions across the borders between Finland and Sweden, Finland and Norway and Finland and Estonia are managed by implicit auctions in the day-ahead market. Implicit auctions imply that market-based methods are applied in capacity allocation, and thus congestion management

is wholly integrated to the functioning of wholesale market. In the implicit auction the energy and transmission capacity between various bidding areas is allocated in a single process to the parties of electricity trading.

Capacity which have not been used on the Elspot day-ahead market is offered to the intraday market, where trading finishes no later than one hour before the hour of operation. However, intraday trading in Finland and between Finland and Estonia is possible until 30 minutes before the hour of operation.

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 Code⁶. 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. However, as an interim solution coordinated net transfer capacity (CNTC) method will be applied until common intraday market platform is able to use parameters of flow-based method.

Finland is considered as a single bidding zone and congestions within Finland and after day-ahead market closure are managed by countertrade.

There are no long-term transmission rights for cross-border trade from Finland to Sweden and from Finland to Norway and from Finland to Estonia or vice versa. For hedging against prices differences between bidding-zone prices and the Nordic system price market actors may use EPADs (Electricity Price Area Differentials).

In accordance with Article 30(3) of the FCA Guideline, the Energy Authority have assessed the bidding zone borders between Finland and Estonia and Finland and Sweden and decided in April 2017 together with Swedish and Estonian regulatory authorities that current electricity forward market provides sufficient hedging opportunities in these bidding zone borders. Thus, the Energy Authority decided not to request Fingrid to issue long-term transmission rights or to make other cross-zonal hedging products available on the FI-EE, FI-SE1 and FI-SE3 bidding zone borders. Situation will be reviewed next time in 2021.

Fingrid provides 1,300 MW of transmission capacity from Russia to Finland available to the electricity market on its 400 kV connections from Russia. Total capacity of these connection is 1,400 MW and Fingrid has reserved a volume of 100 MW to be used as a power system reserve. Electricity can be imported from Russia by customers, who have made an agreement on a fixed transmission right with Fingrid and an agreement on energy purchases with a Russian organisation responsible for electricity sales. The maximum trading capacity from Finland to Russia is 320 MW.

In August 2011, a new trading scheme, so-called direct exchange trade, was adopted in electricity trade from Russia to Finland. Direct exchange trade is a first step towards more market-focused procedures in electricity trade between Russia and Finland and at the same time between Russia and the EU. In this model an electricity market player engaged in direct exchange trade buys electricity in the electricity exchange in Russia and sells it directly to the day-ahead market in Nord Pool. The player can also trade in the secondary market the offered electricity not sold in the day-ahead market, in other words in Nord Pool's or the Russian intra-day market. So far,

⁶ Available from <https://www.entsoe.eu/publications/system-operations-reports/#nordic>

the volume of direct trading is limited to 140 MW, while in conventional bilateral trade is 1,160 MW.

In 2018, about 76 per cent (in 2017: 73 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 95 per cent (in 2016 99 per cent) of time in 2018.

Figure 2 presents the percentage of hours during the year 2018 when equal day-ahead price existed. In this picture the bidding zones of each country are grouped for clarity.

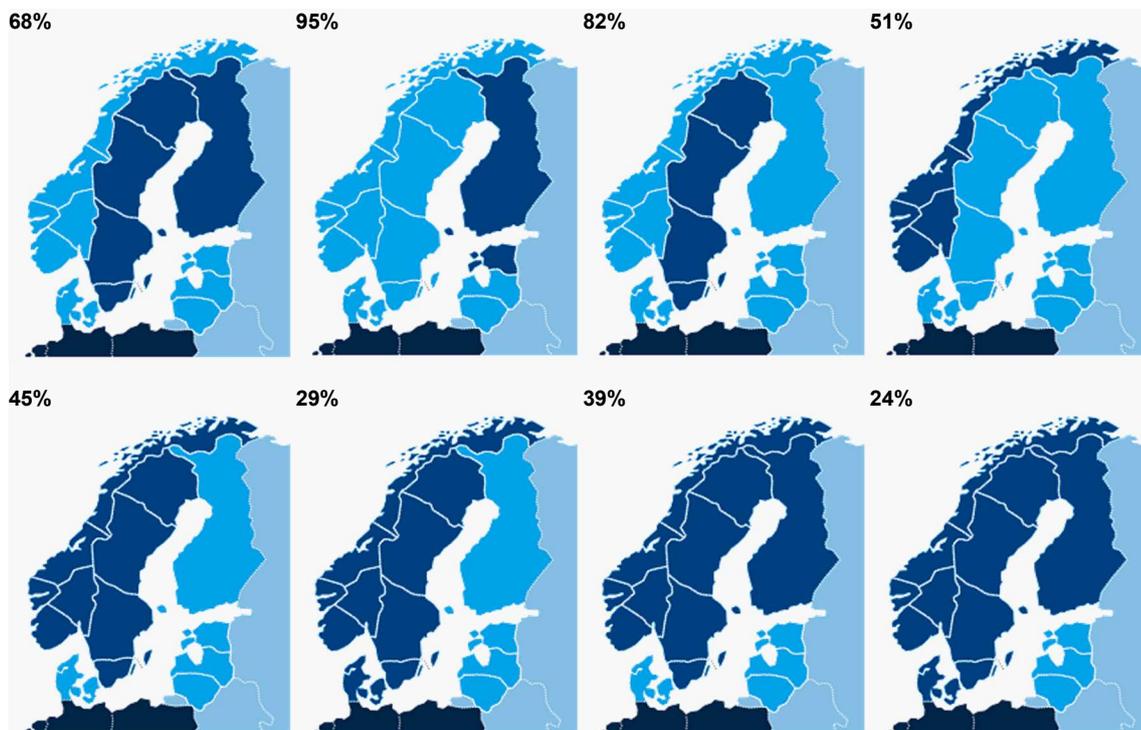


Figure 2. Percentage of hours during which different bidding zones have had equal day-ahead market prices in 2018

Countertrade is used to relieve both national and inter-regional congestions during the daily network operation. Costs of countertrade are paid by the TSO. Table 2 shows the costs of the counter trade paid by Fingrid during the years 2009 - 2018.

Table 2. Net costs of counter trade in Finland during the years 2009 - 2018 in million Euros.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Costs, MEUR	0.085	0.2	1.6	4.7	0.88	10.1	3.8	3.9	1.8	4.1

Source: Fingrid Oyj.

Congestion management method applied to allocate all interconnector capacity in Nordic market, i.e. implicit auction, fulfils the requirements set in the congestion management guidelines. Remaining transmission capacity after day-ahead allocation is set for intra-day market and cross-border balancing. Nordic TSOs publish information either on their own website (e.g. www.fingrid.fi) or Nord Pool's website (www.nordpoolspot.com).

During the year 2018 congestion management income for the Finnish TSO totalled EUR 29.6 million (EUR 25.8 million in 2017). Fingrid uses congestion income to investments that aim to relieve the congestions. Fingrid used in 2018 EUR 28.3 million from congestion incomes Fingrid received in 2018 for financing a transmission grid investment which supports transmission from

Northern Sweden to Finland. Rest of congestion incomes, EUR 1.3 million will be used later for financing investments.

TSO investment plans

Fingrid has published the latest national ten-year network investment plan in summer 2017. The Energy Authority made by September 2017 an assessment that the plan is in line with the community-wide TYNDP from 2016 and the regional investment plan made for Baltic Sea Region. Fingrid will publish the next national ten-year network investment plan in autumn 2019.

3.1.5 Compliance

According to the Finnish legislation, the Energy Authority shall supervise that the provisions of the Electricity Market Act and any rules and regulations issued under it, as well as Regulation 714/2009 are complied with. However, the construction of cross-border interconnectors and the import and export of electricity are supervised by the Ministry of Employment and the Economy.

In 2018 there were no such cases where the Energy Authority should follow the binding decisions of the Agency or the Commission.

The Energy Authority ensures compliance of electricity transmission and distribution system operators with their obligations under the Directive and other relevant Community legislation by using mainly ex-post supervision. Investigation may start based on a request from any market actor or on the Energy Authority's own initiative. In 2018 any such investigation cases were not started.

Since September 2013 the Energy Authority has also had right to propose to the Market Court to impose administrative fines to network system operators or other electricity market actors for the non-compliance with their obligations pursuant to the Electricity Market Act or the Regulation. In 2018, the Energy Authority did not propose to the Market Court to impose administrative fines to any network system operators or any other electricity market actors.

3.2 Promoting Competition

3.2.1 Wholesale markets

Since September 2013 the Finnish legislation has included explicit provisions regarding monitoring the level of transparency, including of wholesale prices, and ensuring compliance of electricity undertakings with transparency obligations and monitoring the level and effectiveness of market opening and competition. The Energy Authority does also the market surveillance as a part of supervision of the European REMIT regulation (1227/2011) and the Transparency Regulation (543/2013)

The development of shares of different generation forms, imports and exports can be seen in the following table.

Table 3. Electricity production by source and import from neighbouring countries in 2010 - 2018.

TWh		2010	2011	2012	2013	2014	2015	2016	2017	2018
GROSS PRODUCTION		80,4	73,5	70,3	71,2	68,1	68,6	68,7	67,5	70,2
	Cons. in power plants	3,4	3	2,6	2,9	2,6	2,5	2,6	2,5	2,7
PRODUCTION		77	70,6	67,7	68,3	65,5	66,1	66,2	65,0	67,5
	Hydro power	12,8	12,3	16,6	12,6	13,2	16,6	15,6	14,6	13,1
	Wind power	0,3	0,5	0,5	0,8	1,1	2,3	3,1	4,8	5,9
	Solar power								0,04	0,2
	Nuclear power	21,9	22,2	22,1	22,7	22,6	22,3	22,3	21,6	21,9
	Conv.therm power	42	35,4	28,6	32,2	28,5	24,9	25,2	24,0	26,4
	Co-gen. CHP	28,5	25,9	22,8	23,4	22,1	20,8	20,9	20,7	21,5
	distr. heat	17,4	14,9	13,5	13,7	12,9	12,1	12,0	11,6	11,8
	industry	11,1	10,9	9,3	9,7	9,3	8,7	8,9	9,1	9,7
	Condensing etc.	13,5	9,6	5,7	8,8	6,3	4	4,3	3,3	4,9
	conv.	13,5	9,6	5,7	8,8	6,3	4,0	4,3	3,3	4,9
	GT etc.	0	0	0	0	0	0	0	0	0
IMPORTS	from	15,7	17,7	19,1	17,6	21,6	21,5	22,1	22,2	22,5
	Sweden	2	5,1	14,2	12,4	18,1	17,4	15,4	15,3	13,7
	Norway	0,1	0,1	0,08	0,05	0,06	0,03	0,2	0,3	0,2
	Russia	11,6	10,8	4,4	4,7	3,4	3,9	0,7	0,8	0,8
	Estonia	2	1,7	0,4	0,5	0,03	0,1	5,9	5,8	7,8
								0,0		
TOTAL SUPPLY		92,7	88,8	86,8	85,9	87,1	87,6	88,3	87,2	90,0
								0,0		
EXPORTS	to	5,2	3,8	1,6	1,9	3,7	5,1	3,2	1,8	2,6
	Sweden	4,8	3,2	0,03	0,2	0	0	0,1	0,1	0,2
	Norway	0,2	0,1	0,09	0,1	0,1	0,06	0,1	0,0	0,1
	Russia	0	0	0	0,03	0	0,02	3,0	1,7	2,4
	Estonia	0,2	0,5	1,5	1,5	3,5	5	0,0	0,0	0,0
								0,0	0,0	
GROSS CONSUMPTION		87,5	84,4	85,1	84	83,4	82,5	85,1	85,4	87,4
	Incl. Electric boilers	0,1	0							

Source: Finnish Energy Industries

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

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. Nord Pool AS provides power exchange services for the trading in day-ahead and intraday markets with delivery in Finland and Nasdaq OMX provides services for trading with financial products in an organised market place.

Energy Authority has designated in December 2015 Nord Pool AS to perform day-ahead and intraday coupling in Finland as a nominated electricity market operator (NEMO) in the line with Commission Regulation establishing a guideline on capacity allocation and congestion management (2015/1222).

January 2016, EPEX Spot SE announced 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.

January 2019 after being designated as a NEMO in Sweden, also Nasdaq Oslo ASA announced 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 and intraday trading services with delivery in Finland.

The Energy Authority approved in April 2017 a plan for multi-NEMO arrangements proposed by Fingrid. Approval was done in cooperation with other Nordic regulatory authorities. As implementation of planned arrangements has not yet been done, EPEX Spot SE and Nasdaq Oslo ASA have not started offering day-ahead or intraday trading services with delivery in Finland.

Since February 2014, in day-ahead market the calculation of zonal electricity prices, generation, offtake volume and transfers between bidding zones has been performed on a European basis. The responsibility of performing the technical calculation is allocated for different European power exchanges on a rotating basis. Complementing the calculations, the power exchanges participating in this arrangement have agreed upon a back-up system, where the primary rotating responsibility to perform the calculation is backed up by secondary, likewise rotating responsibilities by a number of power exchanges to perform a secondary calculation, that could replace the primary calculation in case that could not be performed.

In 2018, the volume of electricity traded in Nord Pool AS in day-ahead market in Nordic and Baltic states amounted to 396 TWh.

The European Cross-Border Intraday (XBID) solution was launched on 12 June 2018 with deliveries on 13 June 2018. The 1st wave of XBID go-live was done with the 10 Local Implementation Projects delivers continuous trading of electricity across the following countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Norway, The Netherlands, Portugal, Spain and Sweden. The XBID solution is based on a common IT system with one Shared Order Book (SOB), a Capacity Management Module (CMM) and a Shipping Module (SM). 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. From the early 5 per cent the share of electricity procured from the Nordic power exchange has increased to cover 70 per cent of the Finnish physical consumption in 2018.

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 2018, the average system market price at the Nord Pool Spot was 50 per cent higher than in 2017. The average system price in 2018 was EUR 43.99/MWh. The average Finnish area price in 2018 was EUR 46.80/MWh, showing an increase of 41 per cent year-on-year. In 2018, about 68 per cent of the time Finland and Sweden had the same market price (68 per cent in 2017). Finland had the same price with Estonia 95 per cent of time in 2018 (99 per cent in 2017).

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 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 decree.

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 practising 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

Number of retail supplier has been stable. At the end of 2018, there were 72 retail suppliers, of which 55 offered their products nationwide. Number of new entrants and fully independent suppliers has gradually increased since 2010. At the same time, some electricity retail companies have been merged into bigger ones.

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. At the end of 2018, there were 11 fully independent electricity retailers⁷. These retailers had about 35 per cent of electricity retail customers in Finland⁸.

In Finland 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 three electricity retailers have larger than five per cent share of retail

⁷ 'Fully independent retailer' means a retailer which does not belong to the same group of company of any Finnish electricity distribution network operator or is not owned by one or several Finnish electricity distribution network operators.

⁸ Note: number is high because two big electricity retailers have sold their network business in Finland.

market. The market share of the three largest companies in the retail market for small and medium-sized customers has been estimated to be 35-40 per cent. The Energy Authority has estimated that the Herfindahl-Hirschman index (HHI) to measure market concentration in retail market is about 600 – 700 showing competitive marketplace.

Table 4. The largest companies in the electricity retail market (market shares according to energy sold to end users connected to the distribution network).

	No. of companies with >5% retail market	Number of fully ⁹ independent retailers	Market share of three largest retail companies (%)		
			large and very large industrial	small-medium industrial and business	very small business and household
2010	4	< 5	N/A	35-40	
2011	4	5	N/A	35-40	
2012	4	6	N/A	35-40	
2013	4	6	N/A	35-40	
2014	4	6	N/A	35-40	
2015	4	8	N/A	35-40	
2016	4	9	N/A	35-40	
2017	4	10	N/A	35-40	
2018	3	11	N/A	35-40	

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

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.

However, according to the Electricity Market Act an electricity retailer in a dominant position within the area of responsibility of a distribution system operator shall deliver 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 (obligation to deliver). At the end 2018, there was 63 electricity retailers having the obligation to supply within at least one distribution network area of responsibility.

An electricity retailer in a dominant position shall have terms of retail sale and prices, and the criteria underlying these publicly available to the customers encompassed by the retailer's obligation to deliver. They shall not include any unreasonable conditions or limitations that would restrict competition within electricity trade. The Energy Authority may order the retailer referred to here to deliver electricity to the customers within the obligation to deliver.

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. In 2018 the Energy Authority did not make such investigations on reasonableness of electricity prices under obligation of supply.

⁹ 'Fully independent retailer' means a retailer which does not belong to the same group of company of any Finnish electricity distribution network operator or is not owned by one or several Finnish electricity distribution network operators.

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 customers, whose main fuse is max 3x63 amperes or whose annual consumption is below 100,000 kWh.

The Energy Authority has regularly analysed price information and made it publicly available in easily comparable form in the Energy Authority's price comparison web service (www.sahkonhinta.fi) to facilitate market development and to increase customers' awareness.

In 2018, there was increase in retail prices due to increase in wholesale prices. The average price of open-ended contract for electrical energy including taxes for a residential customer with annual 5,000 kWh consumption increased by 17.5 per cent. For a small house with electric heating (annual consumption 18,000 kWh) the price increase was 18.6 per cent. The average price of two years fixed-term contracts for a residential customer went up with 41.1 per cent and for a household customer with electric heating increase was 33.9 per cent.

The electricity distribution price including tax was 4.9 per cent more expensive for household consumers – for electrically heated households 3.8 per cent – at the beginning of 2019 than at the beginning of 2018.

In 2018, the electricity bill for apartment house households and households with electrical heating increased in total by 10.1 and 10.7 per cent respectively.

In 2018, there were no changes in electricity taxation in Finland. 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. 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

Monitoring market opening and competition

The Energy Authority monitors that all necessary information is available to all retail market participants and overlooks that suppliers follow the transparency requirements set by the Electricity Market Act. Monitored parameters include price level, price spread and switching rates. The Energy Authority publishes statistics on electricity prices monthly and other information annually.

Contractual issues are dealt with case-specifically in co-operation with the Finnish Competition and Consumer Authority and contractual freedom, compatible with Community law, is respected.

Since 2007 the Energy Authority has collected information on supplier switching from the distribution system operators. In 2018, the estimated number of customers that switched their supplier was about 388,000.

Table 5 shows the supplier switching rates in 2007 - 2018.

Table 5. The share of customers who have switched the supplier in 2007 - 2018.

	Households and other permanent dwellings		Other customers		Total
	< 10000 kWh/a	>10000 kWh/a	Max 3x63 A	>3x63 A	
2007	3.0 %	6.8 %	3.3 %	8.0 %	4.0 %
2008	3.4 %	5.6 %	2.8 %	6.2 %	4.4 %
2009	7.2 %	10.9 %	5.1 %	11.6 %	8.1 %
2010	8.0 %	10.5 %	4.8 %	12.6 %	7.6 %
2011	7.0 %	11.7 %	4.7 %	14.1 %	7,6 %
2012	6.6 %	9.6 %	4.1 %	13.0 %	7.6 %
2013	10.2 %	12.7 %	3.1 %	18.0 %	10.1 %
2014	11.8 %	11.2 %	2.4 %	12.9 %	9.8 %
2015	12.5 %	13.1 %	5.8 %	16.1 %	11.4 %
2016 ¹⁰	12.4 %		9.9 %		12.1 %
2017	11.3 %		11.0 %		11.1 %
2018	11.1 %		10.2 %		10.9 %

Share of customers switching supplier has been slightly decreasing since 2016. According to a study¹¹ made by Sentio Research AS for Nordic energy regulators in 2018 on consumer behaviour in Nordic electricity market, customers' interest to switch the supplier is mainly driven by potential to save money. In the study 45 percent of Finnish respondents mentioned saving money as one reason why they have signed a new contract. Expiring of previous contract was also mentioned as a reason by 34 per cent of Finnish respondents. Similarly, 41 per cent of Finnish customers who have not switch supplier after comparing offers find that by switching contract they would not have saved money enough. Thus, price development and availability of cheaper contracts will influence on supplier switching rate as well. On the other hand, according to same study 61 per cent of Finnish respondents answered that they have compared their current electricity contract with other contracts and thus showed being interested in electricity markets.

Since 2016 Energy Authority has collected information on how many customers have chosen different type of supply contract (e.g. open-ended contract, fixed term contract or dynamically priced contract). At the end of 2018, about 49 per cent of retail customers had open-ended supply contract which customer may terminate with two weeks' notice.

Suppliers are also providing fixed-term contracts with the most common duration being one or two years. If a fixed-term supply contract has been concluded outside the obligation to supply with a consumer for a period longer than two years, the consumer may terminate the contract after the period of two years in the same way as he may terminate a contract that is valid indefinitely. At the end of 2018 about 42 per cent of retail customers in Finland had a fixed-term supply contract.

Since the roll-out of smart meters and using hourly measured consumption in balance settlement instead of load curves in most consumption points 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

¹⁰ Since 2016 grouping used in data collection has been changed. Data has been divided into two customer groups: household customers and other customers.

¹¹ Available from <https://www.nordicenergyregulators.org/publications/publications-2018/>

end of 2018, about 9 per cent of retail customers in Finland had a dynamic electricity price supply contract.

Nationally, the legal provisions on information exchange between the parties are set forth in the Decree, issued by the Ministry of Employment and the Economy in December 2008. It is supplemented by the branch organisation's recommendations. These rules set the framework for the information exchange during the supplier switching: what kind of information and in which timetable the new supplier and the DSO have to send to the other market actors and also what are the conditions for the present supplier to reject the supplier switching process. Market actors shall ensure before taking into use that their information exchange systems can send and receive standard protocol messages.

Regarding the supplier switching process a new supplier shall notify the network operator about the new contract. This notification shall be done at the earliest three months and at the latest 14 days before the contract enters into force. If metering changes are needed in the consumption site, a notification shall be available to a network operator at the latest 21 days before. In practice, the supplier switching process is carried out in two weeks' time taking into account the notice period for ending the current contract. However, the Energy Authority has not collected statistical information on actual time delays for switching.

For customer protection purposes it has been made possible by the Government decree for a customer to stop the supplier switching process in misselling situations. If a customer provides the DSO with a written notification that he has denied the new supply contract and informed the new supplier about it the DSO shall stop the process.

3.2.2.2 Investigations and measures to promote effective competition

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.

In 2017 the Energy Authority gave a decision regarding the customers' right to receive their electricity invoices free of charge. The issue arose from a discount granted by a supplier to customers who chose an invoicing method other than paper invoicing. The Energy Authority stated in its decision that such discounts are in conflict with the Electricity Market Act as they result in the same outcome as charging an extra fee from customers who choose paper invoicing. This decision was contested by the addressee and proceedings were started in the Market Court regarding the right to give discounts to customers choosing certain billing methods. In April 2018, the case was referred to the Court of Justice of the European Union for preliminary ruling. In May 2019 the European Court of Justice issued a ruling stating that such discount is not the same as charging an extra fee from customers who choose paper invoicing and therefore giving the discount is not against the Energy Efficiency Directive 2012/27/EU (Case C-294/18). The Market Court then reversed the Energy Authority's initial decision.

An issue that has been the subject of recent Energy Authority investigations concerns the information given by suppliers to customers before a contract for the supply of electricity is formed. Especially these investigations concern products for which the price formation mechanism is bound to market prices, i.e. it results from a reference value beyond the influence of the parties, and products which only follow market prices to some extent but for which the price is ultimately set by the supplier.

In 2018 the Energy Authority gave one decision regarding the above-mentioned matter and started six new investigations on its own initiative. In the decision, the Energy Authority referred to the requirements set out in the Electricity Market Act on the information to be given to the customer before concluding a contract and stated that by not disclosing the price formation

mechanism in clear and unequivocal way the customers have not been informed about the essential terms and conditions of the contract. Furthermore, as the price formation mechanism had not been bound to a reference value beyond the influence of the parties the supplier had failed to comply with the requirements of the Act on the notification period for changes in the prices of the product. Where the price formation is not bound to external reference values, i.e. the supplier may change some or all price components, the change in price must have been directly communicated to customers a full calendar month before the changes were put into force. The supplier has since appealed the decision and the proceedings are currently ongoing in the Market Court.

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. The system has also been developed to better inform customers about the origin of the electricity they purchase. All retail suppliers are obligated to maintain up-to-date information on their public electricity price offers on this service. In 2016, the Energy Authority initiated a project to renew the service with aim to better fulfil customers' needs. The new service has been planned to be taken into use in 2019. The Energy Authority 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.

To promote and facilitate competition and public market analysis the Energy Authority also publishes monthly statistics on retail and network prices.

Since 2005, Nordic energy regulators under the NordREG organisation have been working to promote and facilitate a common end-user market for electricity in Finland, Denmark, Sweden and Norway. The main objective for the end-user market integration is to minimize regulatory and technical obstacles for suppliers willing to operate across the Nordic countries. NordREG has made several recommendations in order to harmonise rules and processes among the Nordic countries. However, implementation of these recommendations in Finland has been delayed as it requires national political decisions.

In 2018 NordREG conducted a study¹² to explore the customers' views and experiences of the four Nordic electricity markets in Denmark, Finland, Norway and Sweden. The study consists of a survey for 1,500 participants in each of these countries, which means a total of 6,000 respondents. One of the findings from the survey was that the share of active electricity customers is highest in Finland.¹³

3.3 Security of supply

3.3.1 Monitoring balance of supply and demand

The Energy Authority has a responsibility for monitoring the security of supply situation for electricity. During the year 2018 Finland has not implemented any safeguard measures as mentioned in the Article 42.

The Energy Authority collects and maintains information on generation and interconnector capacity, while the Ministry of Employment and the Economy has the responsibility for preparing the estimates for the demand of electricity. In 2016, the Government published the National Energy and Climate strategy for 2030. In the base scenario estimated electricity consumption in Finland would be about 88 TWh in 2020 and about 92 TWh in 2030.

Table 7 presents the short-term estimation of peak load demand in very cold winter day.

¹² Available from <https://www.nordicenergyregulators.org/publications/publications-2018/>

¹³ In the survey 'active customer' means a customer who has signed a new contract with an electricity supplier during the last 12 months.

Table 6. Short term forecast for peak load demand.

Winter season	2019-2020	2020-2021	2021-2022
Estimated peak load, MW	15,300 MW	15,400 MW	15,500 MW

Domestic production capacity of electricity has been decreasing because of low profitability - low electricity price. Especially some coal condensing power plants are under threat of decommissioning prematurely. Because of large combustion plants directive (2001/80/EC) some older plants are exiting the market.

The Energy Authority has estimated, that domestic electricity generation capacity is not sufficient to cover the electricity consumption during peak consumption periods in a normal year. Dependency to electricity import at winter times is 2,000 – 4,000 MW. In peak load situation at winter period 2019 – 2020, available electricity production capacity will be about 11,950 MW. Importing capacity is around 5,200 MW.

Dependency on imports will significantly decrease once the new nuclear power plant unit (Olkiluoto 3) has been commissioned. Originally, the new unit should have been commissioned by the end of 2009. The latest official estimation of commissioning is in the beginning of 2020. Even though Olkiluoto 3 has been completed, Finland will still be dependent on electricity import in peak load situations.

3.3.2 Monitoring investments in generation and interconnector capacities

Monitoring investments in generation capacity

Energy Authority has estimated that the total available domestic generation capacity during the winter season 2018 - 2019 was about 12,000 MW which includes also 729 MW of peak load reserve.

Total installed generation capacity in Finland was about 17,600 MW in the end of 2018. Installed wind generation capacity was about 2,000 MW at the same time. However, the available amount of wind generation in peak load period in winter is assumed to be 120 MW (capacity factor 6% at cold winter day). Estimated available generation capacity in the winter season 2019 - 2020 will be about 12,000 MW.

Table 7. Electricity Generation Capacities in Peak Load Period in 2008 – 2019, MW

	Separate Electricity Generation				Gas turbines and engines	Combined Heat and Power		Capacity of power stations	Power system reserves
	Hydro power	Nuclear power	Con- densing power	Wind power		Indus- try	District heat		
2008	2,350	2,700	2,650	-	-	2,450	3,150	13,300	1,180
2009	2,350	2,700	2,650	-	-	2,450	3,150	13,300	1,180
2010	2,550	2,700	2,200	-	-	2,300	3,350	13,100	1,180
2011	2,575	2,730	2,200	-	-	2,365	3,490	13,360	1,240
2012	2,595	2,750	2,045	-	-	2,370	3,490	13,155	1,240
2013	2,610	2,765	2,045	-	-	2,330	3,550	13,300	1,556
2014	2,610	2,765	1,650	-	-	2,330	3,430	12,800	1,540
2015	2,640	2,765	760	-	-	2,330	3,430	11,900	1,580
2016	2,600	2,780	850	-	-	2,000	3,300	11,600	1,400
2017	2,550	2,792	970	100	-	1,990	3,260	11,660	1,400
2018	2,570	2,807	970	120	-	2,250	3,290	12,007	1,400
2019	5,570	2 810	970	120	-	2,250	3,290	12,010	1,400

Generation fuel mix for energy from the year 2018 is presented in Figure 3.

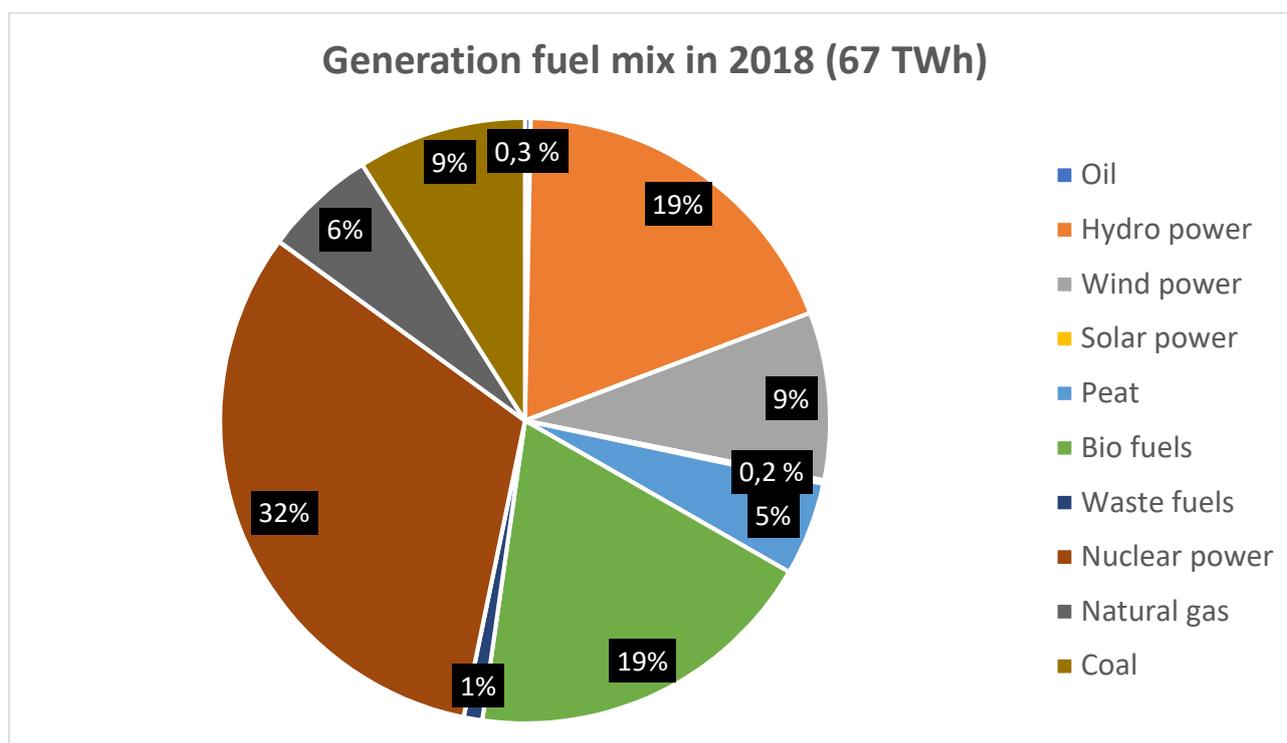


Figure 3. Generation fuel mix for energy (TWh) in 2018. Source: Finnish Energy Industries.

The hydro balance in 2018 was slightly lower than average, which explains the lower hydro power production than previous years. Start of Olkiluoto 3 nuclear power plant (based on latest information in 2020) will change fuel mix for power generation in Finland as it would produce annually about 12 - 13 TWh. Also, share of wind power has been increasing.

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.

Electricity production capacities under planning or construction at the moment and notified to the Energy Authority are presented in Table 9. Wind power capacities for years 2021 - 2022 are based on the results of renewable energy tendering process held by Finnish Energy Authority in 2019. The tenders were submitted concerning annual energy production (MWh), not the installed capacity (MW). The Energy Authority will receive the information about exact capacity later.

Table 8. Forthcoming new generation capacity in 2017-2019

MW	Hydro	CHP		Nuclear power	Wind Power
		District heating	Industry		
2019	3	-10			243
2020	6	2.5		1,600	189
2021	6				90-115
2022					150-260

Monitoring investments in interconnection capacity

Any new investments in interconnection capacity has not been made since the Estlink 2 between Finland and Estonia started operation in the beginning of 2014.

In autumn 2016, Fingrid and Swedish TSO Svenska Kraftnät announced that they have started planning of new AC cable between northern Finland and Sweden. The project has been proposed and approved to the European PCI-list. The connection is evaluated to be operational in 2025 with capacity of 800 MW.

Further, a new investment to replace Fennoskan 1 HVDC – connection between Finland and Sweden might happen in the late 2020s.

3.3.3 Measures to cover peak demand or shortfalls of supplies

Strategic power reserves

Finland has a strategic capacity mechanism – the peak load reserve. The peak load reserve capacity could be used to ensure that the balance between supply and demand is achieved if the balance has not been achieved in commercial market i.e. in the day-ahead market. However, the peak load reserve capacity is not allowed to participate and bid on the commercial market.

The Energy Authority is responsible for evaluating and deciding the required size of the peak load reserves and arranging the tendering process to procure the peak load capacity. During the current period (from 1st of July 2017 until 30th of June 2020) the peak-load reserve capacity consists of four power plants (707 MW) and two demand-side response (DSR) facilities (22 MW).

During the winter period, from December to end of February, power plants participating in the peak load reserve system are in 12 hours' readiness to start electricity production. Otherwise, power plants are in one-month readiness. In production, power plants selected to the peak load reserve shall be able to increase power output with 10 MW within 10 minutes after request and be ready for 200 hours continuous power production with full capacity during the winter period. DSR facilities are included in the peak load reserve only during winter period from December to February. During this period DSR facilities shall be able to decrease load with 10 MW within 10 minutes after request.

Fingrid is responsible for making agreements with the selected power plants and Fingrid also pays the compensations to the power plants which are financed by the fees collected from the

Finnish electricity end-users. The holders of the selected reserve capacity will receive fixed compensation for providing the reserve capacity. When the reserve capacity is activated, only actual costs caused by the activation are remunerated to the capacity holders.

Activation of peak load reserve capacity is very rare. The last time the peak load reserve capacity was activated was during the winter 2009 - 2010.

The activation of power plants will happen with the maximum price of the day-ahead markets, at present EUR 3,000 per MWh. DSR facilities will be activated in balancing market at price EUR 3,000 per MWh (or at actual costs provided by capacity holder in tendering process if it is higher than EUR 3,000 per MWh).

The Energy Authority has started in 2019 preparations for the next peak load reserve period starting on 1st of July 2020.

Responsibilities of TSO regarding security of supply and operational security

The transmission system operator Fingrid secures the system operation in Finland by delivering the following services:

- Maintenance of operational security
- Maintenance of frequency (by power reserves)
- Maintenance of voltage
- Data exchange to maintain operational security

Maintenance of operational security implies that power system is planned and operated in a way that the impacts of disturbances are minimised. Here the grid planning, transmission limits, disturbance management and reserves (frequency controlled and fast disturbance reserves, black start reserves) are considered.

The power system in Finland is planned in accordance with principles agreed jointly between Nordic TSOs in Nordic Grid Code¹⁴. The main planning principle is that the power system shall withstand any single fault (n-1 criteria). A dimensioning fault (worst possible fault) varies on the basis of the operational situation of the Finnish grid but is often the tripping of the largest production unit or an extensive busbar fault.

Electricity transmission in the main grid are kept during real time operation within the predefined limits given by operational reliability calculations, which take into account potential faults and planned outages in the power system. The transmission limits are defined for each probable fault and network situation. Short-term congestion problems in the main grid are managed commercially through counter trade, and long-term congestions are managed by applying price areas or by investments in the grid.

The Nordic electricity grid is synchronously interconnected and the frequency may vary in normal state between 49.9 and 50.1 Hz. The frequency containment reserve for normal operation, frequency containment reserve for disturbances and automatic frequency restoration reserve are power reserves which are activated automatically by frequency changes. Within the Nordic power system, it has been agreed that countries maintain continuously a frequency containment reserve for normal operation (FCR-N) of 600 MW. Of this volume, Finland's share is presently 140 MW.

For disturbance management purposes, both power and transmission reserves are maintained in the Finnish power system. TSO is responsible for the maintenance of reserves that are needed in the Finnish power system. For this, TSO uses its own resources and also purchases reserve maintenance from other resource owners. Restoration of the power system from severe disturbance incidents is headed by TSO's Power System Control Centre.

¹⁴ Available from: <https://www.entsoe.eu/publications/system-operations-reports/#nordic>

The frequency containment reserve for disturbances (FCR-D) begins to activate when frequency goes below 49.9 Hz, and the full reserve has been activated at a frequency of 49.5 Hz. The reserve used includes both active power reserves of power plants and load shedding. During a normal operational situation, the interconnected Nordic system is required to have approximately 1,200 MW of frequency-controlled disturbance reserves, of which Finland's obligation is approximately 260 MW.

The manual frequency restoration reserve (mFRR) consists of active and reactive power reserves that can be activated manually within 15 minutes. After activating this reserve, the power system has been restored to such a state that it can withstand another potential disturbance. In the Nordic grid, each country must have a volume of fast disturbance reserve that equals the country's dimensioning fault. Dimensioning fault will increase in Finland after Olkiluoto 3 nuclear power plant is operating.

Table 9 presents summary of reserves for securing system operation in Finland.

Table 9. Summary of reserves for securing system operation 2018 in Finland (Source: Fingrid Oyj).

Type of reserve	Maximum contractual capacity	Obligation
Frequency controlled normal operation reserve (FCR-N)	- Yearly market, 72.6 MW - Hourly market, 124 MW - Vyborg DC link, 90 MW - Estonia DC links, 35 MW	140 MW
Frequency Containment Reserve for Disturbances (FCR-D)	- Yearly market, 435MW - Hourly market, 595 MW	220-265 MW
Automatic Frequency Restoration Reserve (aFRR)	-	0-70 MW
Manual Frequency Restoration Reserve (mFRR)	- Fingrid's reserve power plants 935 MW - Leasing reserve power plants 299 MW	880-1100 MW

The voltages in the power system are maintained at a technically and commercially optimal level during both normal and disturbance situations. The objective of voltage level and reactive power adjustment is to prevent overvoltage and undervoltage, to achieve nominal voltages specified in agreements (110 kV network) and to minimise the grid losses. The voltage level in the Finnish transmission grid is adjusted by using reactors and capacitors. The voltage ratio between different voltage steps is controlled with on-load tap changers of transformers.

Instantaneous reactive power reserve is also needed in order to secure the technical functioning of the Finnish power system during the disturbances. The reactive power reserves of the main transmission grid are located in synchronised generators. Reactors and capacitors also serve as reserves. Reactive power reserves are activated automatically when the voltage in the grid decreases as a result of a disturbance. Compensation is paid to power producers for reactive power reserves reserved in generators.

TSO takes care of data exchange required by the maintenance of operational reliability in the power system. TSO and parties connected to the grid supply each other with planning and measurement data needed in the maintenance of operational reliability. Such data includes production plans, generator power measurements, and status data on generator circuit breakers and connecting stations. If necessary, the amount of data and the technical details of data exchange are agreed upon between TSO and the other party through a separate data exchange agreement.

4 Gas market

Market structure

The Finnish natural gas market is presently isolated with a pipeline connection only to the importing country Russia. There is only one importer and wholesale supplier – Gasum Oy – which also owns and operates the natural gas transmission network.

Commissioning of Balticconnector pipeline by the end of 2019 will connect the Finnish market to the Estonian and Baltic gas markets by creating the environment for establishing a common entry-exit zone for Finland and the Baltics.

There were 24 local natural gas distribution system operators at the end of 2018. As can be seen from the Figure 4, all the Finnish natural gas DSO's and the consumption sites of natural gas are situated in the southern part of the country along the gas transmission network.



Figure 4. Map of natural gas network in Finland (source: Finnish Gas Association)

A separate market place, operated by Kaasupörssi Oy and owned by Gasum Oy, has been established for trading gas on the secondary market.

The first off-grid LNG terminal in Pori (in the west-coast of Finland) was commissioned in autumn 2016. Another small-scale off-grid LNG terminal in Tornio (in northern Finland) was taken into operation in 2018. These terminals would serve industrial users, maritime of use LNG and LNG trucks. There is also ongoing project to construct a small-scale on-grid LNG terminal in Hamina (in the south-coast of Finland). This terminal will be commissioned in 2020 and connected into local gas distribution network and provide gas customers connected into local distribution network and other off-grid customers. In 2014 State of Finland granted investment support for all these LNG terminals.

In addition to natural gas imported from Russia, renewable biogas from four different Finnish biogas plants is also injected into the gas transmission network.

General information on Finnish gas market regulation

The Finnish natural gas market has been under sector-specific regulatory supervision since the assertion of the Natural Gas Market Act in August 2000. The Natural Gas Market Act was amended first at the beginning of the year 2005 to implement the Natural Gas Market Directive (2003/55/EC) and the second time in 2013 to include the requirements of the Gas Directive 2009/73/EC.

Finland has availed itself of the possibility of a derogation allowed by the Natural Gas Market Directive. Following this, the natural gas market has not been opened and certain provisions from the European natural gas market regulation, e.g. network codes, are not applied in Finland. This exemption is effective as long as Finland does not have a direct connection to the natural gas network of any other EU Member State and as long as Finland has only one main natural gas supplier.

A new Natural Gas Market Act (587/2017) came into force 1 January 2018. The intention of the new act is to open the gas market for competition, require ownership unbundling of the TSO and lift the derogation by 1 January 2020. From 1 January 2020, the Regulation (EC) No 715/2009 on conditions for access to the natural gas transmission networks and European gas network codes will be applied in Finland.

4.1 Network regulation

4.1.1 Unbundling

Unbundling of transmission system operator

As Finland has availed itself of the possibility of an exemption allowed by the Natural Gas Market Directives, there is neither legal nor operational unbundling of natural gas transmission network operation. The only wholesale supplier of natural gas – Gasum Oy – is also the sole importer and operator of the transmission system. Gasum Oy has been 100 per cent state-owned company since OAO Gazprom sold its shares to the State of Finland in December 2015.

According to the new Natural Gas Market legislation, gas transmission system operations shall be ownership unbundled from electricity and gas generation and supply by the 1 January 2020. As Finland has a derogation from the unbundling requirements of the Directive, the certification of the natural gas TSO has not been done in Finland yet. Certification of the natural gas TSO will be done in 2020.

The project promoter for the Balticconnector-pipeline in Finnish side is a specific project company Baltic Connector Oy, currently a subsidiary of Gasum Oy.

Unbundling of distribution system operators

Legal and operative unbundling requirements are 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.

Approximately 80 per cent of the Finnish gas DSOs are wholly or mainly owned by municipalities. The rest 20 per cent of the DSOs are owned by industrial users of natural gas. In Finland, retail supply of natural gas is done in most cases within the same company as gas distribution. There is no natural gas production in Finland.

Accounting unbundling

The accounting unbundling requirement applies to both transmission and 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.

Accounting unbundling requirements are specified with the ministerial degree and the Energy Authority has issued the non-binding guidelines on the compilation of unbundled financial statements. Both the distribution system operators and the transmission system operator shall to publish unbundled accounts with certain formula as a part of the statutory financial statement.

The unbundled income statements, balance sheets and any supplementary information of separated operations are audited as part of the statutory auditing. The accounts are not subject of a separate audit and this audit is not addressed to the requirements of the regulator in any extent. Auditors are required to give their opinion in the auditor's report on whether the income statements and balance sheets and the supplementary information conform to Natural Gas Market Act and any rules and regulations related to it.

The Energy Authority has issued non-binding guidelines aim to help the audit of unbundled financial statements in different electricity system operators and inform the auditors about the unbundling requirements.

The Energy Authority supervises that the network companies are fulfilling the unbundling requirements. The Energy Authority has also power to oblige the companies to correct mistakes or omissions. A conditional fine may be imposed to make decisions effective. As a final mean the Energy Authority may also withdraw the network license from the company.

4.1.2 Technical functioning

Unplanned interruptions in gas supply in Finland are very rare. Therefore, any key figures on average interruptions per customers are not feasible to calculate and present.

4.1.3 Network and LNG tariffs for connection and access

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 setting both transmission and distribution network tariffs and 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 of setting 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 windfall 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.

According to the Act on Supervision of Electricity and Gas Markets the methodology confirmed by the regulator may include the following items:

- method for the valuation of regulated asset value
- method for determining approved rate of return on capital
- method for determining realised profit of network operations
- method for setting efficiency targets for network operations

The present methodology of setting network tariffs includes all items mentioned above, besides efficiency targets for distribution network operations.

The network will be included into the regulated asset base by using the net present value instead of a book value. The net present value of network will be updated by taking into account depreciation and investments. The approved rate of return on capital is determined by using a WACC-model (Weighted Average Cost of Capital). The methodology provides incentives to the transmission and distribution system operators to develop their network as all network investments are included into regulated asset base. For natural gas TSO the confirmed methodology includes also incentives to maintain and improve its cost efficiency and security of supply level.

The Energy Authority collects annually from the network operators several kinds of data of network operations, like tariffs of network services, financial information and technical key figures. Annually collected technical key figures include i.e. information on quality of supply. The Energy Authority has also power to ask additional information from the transmission and distribution system operators on network operations for the supervision purposes.

According to the natural gas market legislation, charges of transmission and distribution services shall be public. TSO and DSOs shall have public charges and terms and conditions for network services.

As all LNG terminal projects in Finland have received state-aid, European Commission has requested that the regulation concerning the 3rd party access and ex-ante approval of terminal tariffs shall be applied to those LNG terminals. In March 2018, the Energy Authority approved tariffs for the LNG terminal in Pori and in February 2019 the Energy Authority approved tariffs for the LNG terminal in Tornio.

4.1.4 Cross-border issues

The Finnish natural gas transmission network is presently only connected to the Russian natural gas pipeline. The only natural gas wholesale company, Gasum Oy, imports natural gas and transmits it through its own transmission network to large-scale consumers and distribution companies. Gasum Oy is also the owner of the Finnish side of the natural gas interconnector point in Imatra between Finland and Russia. Thus, interconnection capacity allocation or congestion management procedures have not been necessary.

Opening of Finnish gas markets for competition on 1 January 2020 and commissioning of Balticconnector pipeline will require that also rules for capacity allocation management in Imatra and Balticconnector interconnector points shall be in place. In July 2019, the Energy Authority approved these rules for year 2020.

4.1.5 Compliance

According to the Finnish legislation, the Energy Authority shall supervise that the natural gas transmission system operator, distribution system operators and suppliers are compliant with the provisions of the Natural Gas Market Act and any rules and regulations issued under it. As according to the Article 49(1) Finland has a derogation from the Article 9 of the Directive 2009/73/EC there are no legal obligations for the certification of the Finnish natural gas transmission system operator. The Energy Authority ensures compliance of natural gas transmission and distribution system operators with their obligations under the Directive and other relevant

Community legislation by using mainly ex-post supervision. Investigation may start based on a request from any market actor or on the Energy Authority's own initiative.

The Energy Authority has powers to order in the obliging decision how the mistake or omission should be mended. The obliging decision may also include an order to refund customer a fee incorrectly charged from him. The Energy Authority may also impose a conditional fine to make a decision effective. Since September 2013 the Energy Authority has also had right to propose to the Market Court to impose administrative fines to network system operators or other natural gas market actors for the non-compliance with their obligations pursuant to the Natural Gas Market Act or the Regulation.

In 2018 there were no such cases, where the Energy Authority should follow the binding decisions of the Agency or the Commission.

4.2 Promoting Competition

4.2.1 Wholesale markets

Market

In the year 2018, Finnish natural gas volume was 24.7 TWh (22.3 TWh in 2017). Less than 150 customers – large industrial end-users as well as power and district heating plants - account about 92 per cent of the natural gas consumption in Finland. Energy and power companies are using about 34 per cent of gas in CHP, district heat and power production. Large industrial end-users are consuming about 58 per cent of total gas consumption in Finland. The key industrial sectors were forest and chemical industries whose consumption corresponded to 56 per cent of Finland's total gas consumption. Natural gas accounts for around 5 per cent of Finland's total energy consumption. In 2018, there were no significant changes in the number of market actors.

Gas end-users connected to the transmission network and gas retail suppliers buy gas for their own use or retail from Gasum Oy based on the public tariff. On natural gas market in Finland, only natural gas users with a consumption of more than 5 million cubic meters and with remote metering can trade in the secondary market with the gas that they have acquired for their own use or retail. Additionally, Gasum Oy offers short term products that are sold on the secondary market operated by Kaasupörssi Oy, which is a subsidiary of Gasum Oy. Total trading amounted to 1,1 TWh or about 40 per cent more than in 2017. Secondary market trading of these were 461 GWh (2017: 368 GWh). Total traded volume was 4.3 per cent of the total Finnish consumption of natural gas in 2018 (2017 1.7 per cent).

Prices

The wholesale supply of natural gas to the large Finnish end-users and retailers is based on cost-based contracts between Gasum Oy and the customers. Those customers buy natural gas from Gasum Oy based on a public tariff.

Pricing of the energy sales of natural gas is based on the natural gas supply contract between Gasum and Gazprom's subsidiary company Gazprom Export. The supply contract is based on the special structure of Finland's natural gas market, which reflects the fact that the price of natural gas follows not just changes in oil prices, but also fluctuations in the price of coal and domestic market energy prices.

The Energy Authority publishes monthly statistics on natural gas prices for large end-users for public market analysis.

The total wholesale price of natural gas, including transmission and natural gas energy, increased by an average of 10 per cent during the course of 2018. The price for natural gas energy excluding taxes increased by 13.6 per cent between January 2018 and January 2019. The price of

natural gas energy is index-linked to the price of heavy fuel oil and the price of coal, as well as to the domestic energy price index. There were no changes in natural gas transmission prices between January 2018 and January 2019.

Estimated national average natural gas prices in December 2018 for one industrial reference customer are shown in Table 10. In household customer groups or smaller industrial customers there are only a few customers within distribution companies and therefore any representative average prices for these customer groups are not possible to define.

Table 10. Natural gas price for a reference customer in December 2018.¹⁵

EUR/MWh	I4-1
Network charges (excl. levies)	9.96
Energy costs and supply margin	27.12
Taxes	19.86
Total (excluding VAT)	56.94

Competition

According to the Natural Gas Market Act the supplier in a dominant market position in a natural gas network shall supply natural gas at a reasonable price upon the request of a customer connected to the network, if the customer has no other economically competitive options to purchase natural gas through a natural gas network (obligation to supply).

Because the Finnish gas market has not been fully opened to competition and there is only one importer/wholesaler, the obligation to supply applies to all gas suppliers. Therefore, the customers in every customer category have the same right to purchase natural gas at a reasonable price. As regards the supervision of natural gas wholesale or retail pricing, the powers of the Energy Authority are ex post by their nature.

4.2.2 Retail market

The retail supply of natural gas covers only about 8 per cent of the total consumption. In Finland, there are only about 23,200 customers in the natural gas market. The largest customer segment, (about 16,400 customers) consists of households who buy natural gas for cooking. However, the total natural gas consumption of this segment amounts to only 0,3 mcm (0.015 per cent of total consumption).

At the end of 2018, there were 24 natural gas retail suppliers. Many of the natural gas retailers in Finland are relatively small having only dozens of customers. The share of the top three retail suppliers is about 50 per cent of the total volume.

The Natural Gas Directive allows to Finland a derogation from the obligation to liberalise its natural gas market, as long as Finland only has one main supplier of natural gas and is not connected to the European gas network. For that reason, supplier switching is not possible in the present situation.

¹⁵ Reference customer: annual consumption 150,000 MWh, 4,000 hours.

4.3 Security of supply

4.3.1 Monitoring balance of supply and demand

The Energy Authority has a responsibility for monitoring the security of supply of gas. The Energy Authority maintains information on transmission network capacity and availability, while the Ministry of Employment and the Economy has the responsibility for preparing the estimates for the demand. In 2018 there were no changes in these competences.

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. Energy Authority publishes annually a report on gas security of supply situation.

Natural gas used in Finland is imported from Russia. There's no natural gas production in Finland. Small-scale biogas is produced and injected into the gas transmission and distribution network in five different locations. In addition, propane can be produced indigenously as it is the only gas to be stocked in small amounts by Gasum Oy for immediate substitute for the possible lack of natural gas.

The importing capacity of Gasum Oy is estimated to be about 9,000 MW. During the peak demand hour in 2018 consumption was 7,575 MWh/h. In natural gas shortage situation market-based mechanisms are used to reduce gas consumption at the first stage. The price of gas that exceeds gas users intended capacity is increased to reduce consumption. During winter 2017-2018 or 2018-2019 there was no need to increase the price of natural gas to reduce consumption.

4.3.2 Expected future demand and available supplies

The competitiveness of natural gas compared to other fuels has weakened during past few years and thus the usage of gas has decreased. Taxation of natural gas in Finland has also made gas less competitive compared to other energy sources. Development in natural gas consumption in 2008 - 2018 is shown in Figure 5.

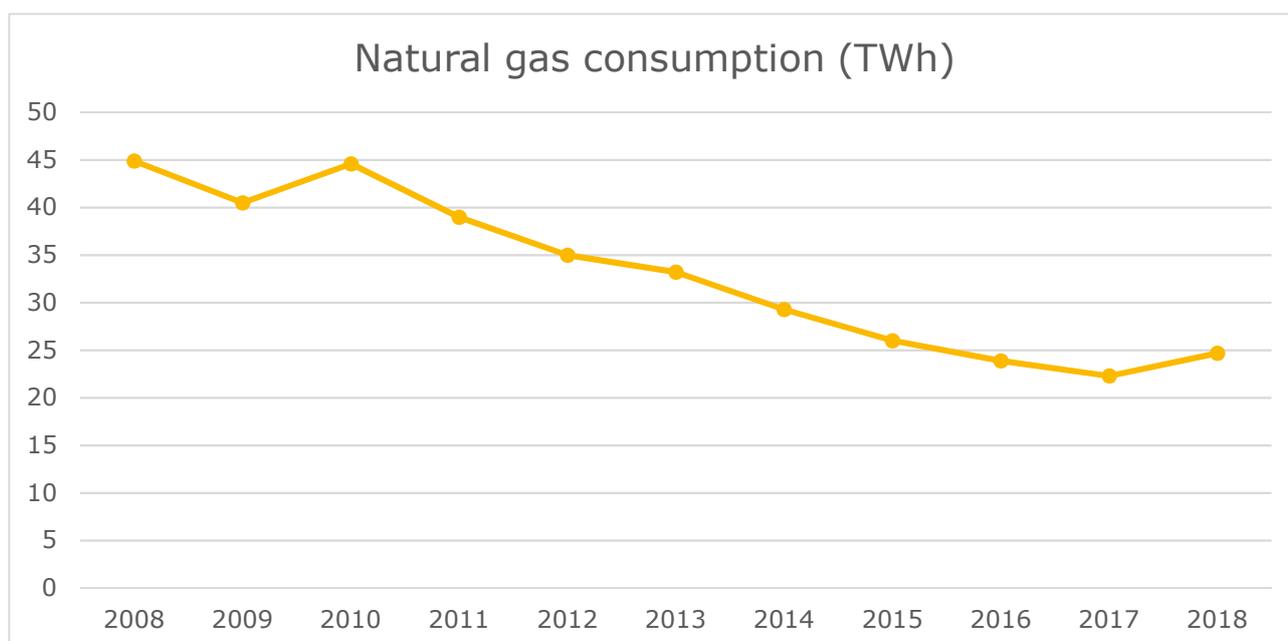


Figure 5. Development in natural gas consumption in Finland in 2008 – 2018.

The Balticconnector-pipeline between Finland and Estonia is currently under construction. The pipeline will be in use by beginning of 2020. It will link Finnish and Baltic natural gas transmission networks and would enable that the Inčukalns underground gas storage in Latvia and LNG terminal in Klaipeda, Lithuania could be used to improve security of supply in Finnish natural gas transmission system. After Lithuanian and Polish gas transmission networks will be connected with GIPL-pipeline, Finnish gas transmission network will have a connection to the European natural gas network via Baltic states.

There are two off-grid LNG-terminals in Finland. LNG-terminal in Pori (in operation since 2016) has a storage capacity of 30,000 m³. Another off-grid LNG-terminal was taken into operation in 2018 in Tornio. Tornio LNG-terminal has a storage capacity of 50,000 m³.

Third LNG-terminal is currently under construction in Hamina. This terminal with capacity of 30,000 m³ will be connected to local distribution network. The terminal will be in use in 2020.

These small-scale LNG-terminals will serve mainly local industrial users, maritime of use LNG and LNG trucks. The LNG terminal in Hamina will serve also gas customers connected to the local distribution network.

4.3.3 Measures to cover peak demand or shortfalls of suppliers

In natural gas shortage situation market-based mechanisms are used to reduce gas consumption at the first stage. The price of gas that exceeds gas users guaranteed capacity is increased to reduce consumption. This kind of market-based mechanism is typically used 0-2 times during the winter time. If shortage situation continues transmission system operator may cut down consumption of non-gas dependent customers. If the shortage situation continues, substitute fuels (HFO, LFO, coal, peat, wood and LPG), a special propane air mixing unit of 350 MW and movable LNG-regasification plant of 75 MW can be used.

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.

During system malfunction almost all 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.

The gas crisis management team coordinates activities, which are related to the severe gas supply disruptions. The group consists of members in Finnish National Emergency Supply Organization's natural gas division as well as coordinator person from the Ministry of Employment and the Economy.

5 Consumer protection and dispute settlement

5.1 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 consumers. The requirements set out in Annex 1 of the Directives 2009/72/EC and 2009/73/EC have been implemented in the national legislation.

Dispute settlement

The Energy Authority does not have power for dispute settlements between consumers and energy companies in individual contractual disputes. In Finland, the disputes between consumers and businesses 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 consumers and businesses.

The Consumer Ombudsman may bring the class action, for instance, against a network operator or supplier and act as the representative of the class in a general court of law.

5.2 Requests for investigation

In 2018, the Energy Authority received 27 new requests for investigation from customers or other market participants related to electricity system operators and retailers. In addition to these, the Energy Authority opened on its own initiative 13 new investigations concerning electricity system operators and retailers. In 2018 the Energy Authority made decision or closed the investigation in 31 cases. Some of these cases were already received in previous years.

Regarding the natural gas markets, the Energy Authority did not receive any new requests for investigation and make any decisions during 2018.

These statistics do not, however, include the phone calls or other written inquiries to the Energy Authority from the energy companies' customers or other market participants.

The requests for investigation and other inquiries submitted fell into the following categories: connection charges, the network tariffs, quality of supply, metering, inconsistencies in invoicing and general complaints regarding practices of the distribution system operators and suppliers.