



Sweden's electricity and natural gas market, 2020



The Swedish Energy Markets Inspectorate (Ei) is an authority assigned the task of working to maintain well-functioning energy markets.

The overall objective of our work is for Sweden to have well-functioning distribution and trading of electricity, district heating, and natural gas. We shall also address the concerns of customers and strengthen their position in the markets.

In concrete terms, this means that we supervise the compliance of companies with the regulatory frameworks. We are also responsible for drawing up the rules of the game and for informing customers about their implementation. We regulate the conditions for the monopoly companies that operate the electricity networks and the natural gas networks, and we supervise the companies in the competitive energy markets.

The energy markets need rules of the game – we make sure they are followed.

The Swedish Energy Markets Inspectorate

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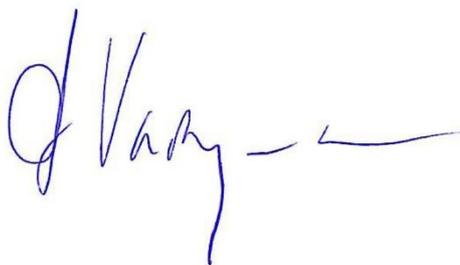
Preface

The Swedish Energy Markets Inspectorate (Ei) is the regulatory authority for the markets for electricity, natural gas and district heating, and constantly monitors the development of these markets. The purpose of this report is to describe the development of the electricity and natural gas market in 2020.

According to Ei's instruction, the authority must perform tasks pursuant to Directive (EU) 2019/944 of the European Parliament and of the Council on common rules for the internal market in electricity, and Directive 2009/73/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas. This involves annual compilation of a report in accordance with the reporting requirements pursuant to the Directives. This report involves regulation issues, competition issues, and issues relating to security of supply.

The report structure used is that agreed on by the European regulatory authorities and the EU Commission. This report, together with the national reports of all member states, will be available in Swedish and English on the CEER website, the Council of European Energy Regulators: www.ceer.eu.

Eskilstuna, June 2021



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Summary – Development in the electricity and natural gas market

Trade on the Swedish electricity and natural gas markets is subject to competition. The electricity and natural gas network operations are regulated monopolies, as it would be inappropriate, both economically and environmentally, to build parallel networks throughout the entire country.

In its role as regulatory authority, Ei must constantly monitor and analyse development in the electricity and natural gas markets and submit proposals for amendments to regulatory frameworks, or other measures, in order to promote the function of the markets.

The electricity market

The Swedish electricity network

The Swedish electricity network can be divided into three levels: transmission network, regional networks, and local networks. The transmission network transports electricity over long distances, at high voltages. The regional networks transport electricity from the transmission network to the local networks, and in some cases directly to major electricity consumers. The local networks are connected to the regional networks and transport electricity to households and other end-customers. The electricity network is made up of 582,000 kilometres of cabling, of which approximately 411,000 kilometres is buried, and 171,000 kilometres is overhead.

The state enterprise, Svenska kraftnät, is owner and operator of the transmission network in Sweden. Svenska kraftnät is responsible for maintaining the power balance and operational reliability in the Swedish electricity network and is certified as transmission system operator (TSO) by the Swedish Energy Markets Inspectorate (Ei). Ei is tasked with reviewing Svenska kraftnät in its capacity as a regulatory authority.

The local and regional utilities are responsible for ensuring that the level of maintenance of their own networks is sufficient to guarantee that the reliability of supply will be upheld.

The Swedish electricity network is operated as a regulated monopoly, where Ei reviews the utilities' revenues and assesses whether they are reasonable. Between 2019 and 2020, network charges on average increased by 0.1 per cent for apartment customers, decreased by 0.1 per cent for house customers with 16 A fuse protection, and increased by 0.01 per cent for house customers with 20 A fuse protection.

Ei decides how much the electricity utilities are allowed to take from their customers over a four-year period by establishing what are known as revenue frameworks. In 2020, Ei decided on the revenue cap for companies following the 2016-2019 regulatory period, and established the deviation decisions for the companies.

For the 2020–2023 regulatory period, Ei decided on revenue caps of approximately SEK 168 billion. Approximately 120 decisions were appealed against to the Administrative Court, which decided on the cases and referred the decisions back to Ei. Ei appealed, and the proceedings are currently ongoing before the Administrative Court of Appeal.

Wholesale market for electricity

On the Nord Pool physical trading platform, a total of 995 TWh of electricity was traded in 2020, of which, 717.9 TWh of the electricity was traded via the day-ahead market within the Nordic Region and the Baltic States. The total intraday trading amounted to 26 TWh. In Sweden, on Epex Spot, 2.94 TWh of electricity was traded via the day-ahead market, and 0.77 TWh via the intraday market.

Total consumption of electricity, including transmission losses, was 134.6 TWh in 2020, representing a decrease of 3.07 per cent on 2019. Electricity consumption was the lowest since 1986, while the average annual temperature of 7.6 degrees was the highest ever measured in Sweden.

Electricity production in Sweden decreased by approximately 3 per cent in 2020 compared with the previous year. When the figures for the year were added together, net yields indicated an export of 25 TWh, which is slightly lower compared to the record year of 2019.

Wind power production increased by a further 39 per cent and amounted to 27.6 TWh during 2020. This type of power accounted for just over 17 per cent of total electricity production, which is an increase of 4 percentage points compared with 2019. Nuclear energy generation decreased by 26 per cent and accounted for 30 per cent of total electricity production.

End-customer market for electricity

In 2020, there were approximately 140 electricity suppliers on elpriskollen.se, Ei's comparison site. At the close of the year, the three largest electricity suppliers had a collective market share of 45 per cent counted in number of customers, which is an equivalent proportion to the previous year.

In 2020, the largest proportion of the total cost of electricity for consumers – 49 per cent – was made up of tax and VAT. The cost for electricity supply amounted to

approximately 22 per cent, while the cost of transmission and distribution accounted for 29 per cent.

The most common electricity supply contract in Sweden during the year was the variable price electricity supply contract. The long-term trend is that more and more people are abandoning fixed contracts and so-called designated contracts (the type of contract for people who do not choose an electricity trading company) in favour of variable price contracts. 53 per cent of Swedish household customers had taken out variable price contracts by December 2020, representing an increase of almost two percentage points compared with December 2019. Over a quarter of customers had a fixed price contract with a tie-in period of one, two or three years.

The natural gas market

The Swedish natural gas network

The Swedish natural gas network is small and comprises 600 kilometres of transmission pipeline and approximately 3000 kilometres of distribution pipeline. The natural gas network is only located on the west coast in southern Sweden. There is an urban and a vehicle gas network in the Stockholm region that each account for approximately 500 and 400 km of pipeline respectively. In addition, there are also a number of small gas networks around Sweden. The small networks are primarily used for transporting vehicle gas-type biogas from production plants to fuelling stations.

One thing the gas network in Stockholm and the small local gas networks around the country have in common is the fact that they are not connected to a transmission network.

The western Swedish gas network and the gas network in Stockholm are the networks covered by the provisions of the Natural Gas Act. According to the Natural Gas Act, natural gas also includes biogas insofar as it is technically possible to use this gas in a natural gas system. There are currently nine biogas producers connected to the western Swedish natural gas system, two of which are connected in order to feed gas directly into the transmission network. Another two biogas producers are connected to the urban and vehicle gas network in the Stockholm region.

Ei sets the revenue framework for the gas network companies, which extends over a four-year period, in a similar way to the rules on the electricity market. This framework defines an upper limit for the total revenues that companies are allowed to charge for their natural gas activities.

For the 2019–2022 regulatory period, Ei decided on revenue caps of approximately SEK 6 billion. Six of nine companies appealed against the decision to the Administrative Court, and in 2020, following court proceedings, Ei established the revenue caps for the companies at approximately SEK 6.05 billion.

Ei is also examining the terms and conditions of the balance administration contract for gas. Ei approved a new balance administration contract for gas in spring 2019. The balancing market for gas has been integrated between Sweden and Denmark since 1 April 2019, making the balancing market larger than the Swedish gas network on its own. It also means that the market meets the requirements set for balancing by the EU's regulatory framework.

Wholesale market for natural gas

Natural gas covers some two per cent of Sweden's total energy need and is therefore a relatively small source of energy. However, in municipalities where the natural gas network is well developed, it represents just over 20 per cent of final energy consumption. This is in line with the average in the rest of Europe.

Sweden saw the consumption of 8.1 TWh of natural gas in 2020, representing a decrease of 0.9 TWh in 2019. Sweden has no domestic extraction of natural gas. Its gas is obtained from Denmark or Germany and then transported via Danish transmission pipelines and on up through the western Swedish natural gas network. In 2020, trading in natural gas took place mainly on the Danish hub ETF on the pan-European trading platform PEGAS (previously Gaspoint Nordic).

End-customer market for natural gas

The western Swedish natural gas network has around 38,800 natural gas customers, of which approximately 4,800 are major industries and CHP plants, and around 34,000 are household customers. The City of Stockholm urban and vehicle gas network has around 61,000 customers, of which around 830 are corporate customers and ten of these are major industries.

There were a total of seven stakeholders that offered gas supply contracts to end customers at the close of 2020, six of which are in the western Swedish natural gas network, and one of which is in the City of Stockholm urban and vehicle gas network.

Consumer protection and disputes

Ei checks that companies in the electricity and natural gas market comply with national legislation and the EU's regulatory framework for the internal market for electricity and gas.

The regulations that Ei monitors include rules on the level of quality that customers should receive in their electricity supplies, since deficient quality of supply causes substantial inconvenience to customers and leads to high costs for society. Disruptions cost the Swedish society around SEK 1 billion each year. Shortcomings in power supply quality in the electricity network may also give rise to major costs. An effective electricity supply is extremely important to the function and development of society.

Consumers have the opportunity to report any company failing to comply with the provisions of the Electricity Act and the Natural Gas Act. As the authority responsible for supervision, Ei can then examine whether the company has breached its statutory obligations. During 2020, Ei had over 1,400 instances of contact with consumers. Consumers that contact Ei usually have queries or complaints about the electricity network or electricity supply.

Ei offers a comparison website for electricity contracts, elpriskollen.se, in order to strengthen the position of consumers in the electricity market. The website allows consumers to compare prices and terms and conditions on the most common contracts from all electricity trading companies. The option of comparing prices and other factors that may influence the choice of electricity trading company is a prerequisite for active customers.

Ei operates in partnership with the Swedish Consumer Agency within the framework for Hallå konsument [Hey consumer]. This is an online service where consumers can view information about their rights on a number of markets, including the energy markets. Here, Ei provides intelligence and information on issues relating to the energy markets.

1 The electricity market

The Swedish electricity market was reformed in 1996. Trading in the production of electricity has been subject to competition since then, while network operations involve a large number of regulated monopolies. The aim of exposing the production and sale of electricity to competition is to increase consumers' freedom of choice and pave the way for effective use of production resources.

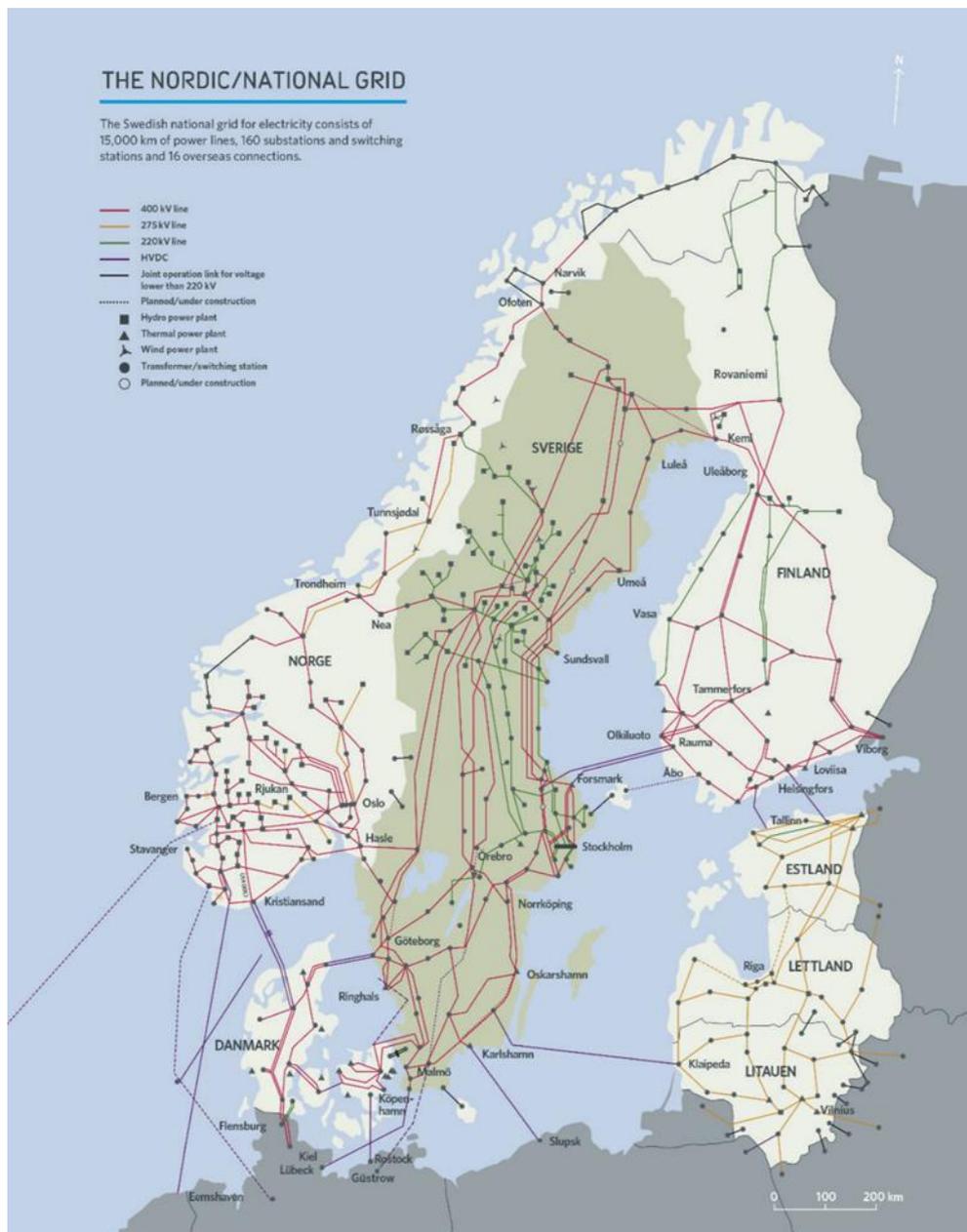
Electricity network operations, on the other hand, are a natural monopoly, which means that having a number of such businesses within the same geographical region is not efficient in cost-benefit terms. This is why the Swedish Energy Markets Inspectorate regulates revenues for network operators.



1.1 The electricity network

The Swedish electricity network is made up of 582,000 kilometres of cabling, of which approximately 411,000 kilometres is buried, and 171,000 kilometres is overhead. The electricity network can be divided into three levels: transmission network, regional networks, and local networks. The transmission network transports electricity over long distances, at high voltages. The regional networks transport electricity from the transmission network to the local networks, and in some cases directly to major electricity consumers. The local networks are connected to the regional networks and transport electricity to households and other end-customers.

Figure 1. The Swedish transmission network for electricity and other connections to other countries



Source: Svenska kraftnät

1.1.1 Legal, accounting and functional unbundling of electricity companies

Network operations must not be pursued by the same legal entity as the entity producing or trading in electricity. This is in order to prevent cross-subsidisation between companies pursuing different types of electricity business. Financial reporting of network operations must also be kept separate from all other business. This means that electricity network operations must be both legally distinct and separated in the accounts from companies producing or trading in electricity. However, an electricity utility may produce electricity if this is intended to cover network losses, or to replace loss of electricity in the event of a power outage. In addition to this, there is a requirement for certain electricity utilities to be functionally separate from companies that produce or trade in electricity.¹ This functional unbundling is applicable to the companies that run network operations and form part of a group where the overall electricity network has at least 100,000 electricity consumers.

In accordance with the Electricity Act, all companies running network operations and that form part of the same group as a company that produces or trades in electricity must compile a monitoring plan². The companies must also publish an annual report describing the measures they have implemented according to the plan. The purpose of the monitoring plan is to ensure that companies operate objectively and do not unduly favour any market stakeholder. The monitoring plan must specify what measures are to be implemented by the company in order to counteract discriminatory behaviour in respect of other market stakeholders.

Ei conducts supervision of the transmission network operator

Svenska kraftnät, which operates and administers the Swedish transmission network, is also the authority acting as the system operator³ for the Swedish transmission system. Svenska kraftnät's job is to administer, run and develop a cost-effective, reliable and eco-friendly power transmission system in a commercial manner, and to provide transmission capacity and otherwise pursue activities linked with the power transmission system. In its capacity as a regulatory authority, Ei has been tasked with monitoring that Svenska kraftnät complies with the rules of the internal electricity market.⁴

Svenska kraftnät's revenue framework is decided in advance for a regulatory period. From 2012, and up to and including 2015, Svenska kraftnät had regulatory periods of one calendar year. From and including 2016, Svenska kraftnät has a

¹ In accordance with Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

² 1997:857 Chap. 3 section 17

³ 'Transmission network operator' and 'transmission network company' are common synonyms for 'system operator'.

⁴ There is no independent system operator in Sweden. This is why the provisions specifically addressing supervision of independent system operators is not applicable to Ei.

regulatory period of four years, i.e. the same period as other electricity utilities. A revenue framework refers to the maximum overall revenues that an electricity utility may earn from its network operations in a regulatory period⁵. In 2020, Ei decided on the revenue cap for Svenska kraftnät following the 2016–2019 regulatory period, and established its deviation decision. In a deviation decision, an assessment is made where network companies that have not used all of their revenue cap (deficit from a previous regulatory period) can transfer the amount to the revenue cap for a subsequent regulatory period. By these means, the revenue cap is adjusted for the subsequent period, as well as the opportunity for the companies to impose network charges on their customers.

In accordance with the EU's Internal Market in Electricity Directive,⁶ the transmission system operators (TSOs) must be certified; this is covered by detailed rules in national legislation. In July 2012, Ei decided to certify Svenska kraftnät as system operator for the Swedish transmission network for electricity. This certification will remain valid until further notice, but it may be reviewed by Ei if the system operator fails to meet the requirements for certification.

1.1.2 Technical function of the electricity network

Ei assesses the reliability of supply in the electricity network based on the outage reports.

An effective electricity supply is extremely important to the function and development of society. Since 2011, the electricity utilities have provided detailed annual reports containing data on outages at customer level, both for short and long-term outages. Based on these data, Ei measures and analyses reliability of supply in the Swedish electricity networks, which is largely by means of producing a range of indicators. Electricity utilities must also report long-term and extensive power outages to Ei on an ongoing basis.

One of the purposes of the reports is also to allow Ei to assess quality of supply in the electricity networks and to intervene if measures taken by the electricity utilities are inadequate. The assessment of the quality of supply is also of significance for the size of the revenue framework. The principle is that shortcomings in quality reduce the size of the revenue framework.

Table 1 shows power outages in local networks during 2003–2019. These figures indicate average values per customer and are divided into unannounced and announced outages. Announced outages are outages of which customers were notified in plenty of time prior to the outage. These outages may be justified for reasons relating to operation or electrical safety, such as due to repairs and

⁶ 2009/72/EC Article 10

preventive maintenance with a view to maintaining good operating reliability and security of supply. According to the Electricity Act, the announced outage must not continue for a longer time than required by the activity.

Table 1. Power outages in local networks due to faults in the local network in question, average values per customer⁷

Year	SAIFI, announced outages (outages/year)	SAIFI, unannounced outages (outages/year)	SAIDI, announced outages (minutes/year)	SAIDI, unannounced outages (minutes/year)
2003	0.19	0.90	27	118
2004	0.19	0.89	25	72
2005	0.21	1.26	32	890
2006	0.19	1.05	22	88
2007	0.31	1.49	22	307
2008	0.50	1.04	26	104
2009	0.22	0.88	20	63
2010	0.14	1.03	20	71
2011	0.19	1.31	16	174
2012	0.14	1.03	17	75
2013	0.14	1.02	18	139
2014	0.15	0.98	16	69
2015	0.14	0.96	16	107
2016	0.15	0.85	18	61
2017	0.14	0.82	16	52
2018	0.13	1.01	15	73
2019	0.15	0.96	17	120

Statistics for 2020 will be completed in summer 2021. Source: Ei

On average, rural electricity networks are affected by more outages and longer outage periods than electricity networks in urban districts. Rural networks are generally more exposed to weather-related disruptions, partly due to the fact that these networks frequently have a higher proportion of uninsulated overhead cables and a lower proportion of buried cables than with urban networks. The proportion of buried cables in local networks has increased with a view to reducing the vulnerability of these electricity networks in respect of extreme weather. However, buried cables may be affected by disruptions that are not dependent on the weather, such as outages caused by cable rupture due to excavation work or ageing components. With regard to overhead cables, insulated cables are more robust than uninsulated cables. Approximately 99 per cent of local networks' total cable length in the low-voltage network is insulated. At medium

⁷ SAIFI = System Average Interruption Frequency Index (average number of outages per customer throughout the year (number of outages/year))

SAIDI = System Average Interruption Duration Index (average outage time per customer throughout the year (outage minutes/year)).

⁷ These figures relate to 2019. Statistics for 2020 will be completed in autumn 2021.

and high-voltage level in the local networks, around 80 per cent of cables are insulated.⁸

Rules for reliability of supply and compensation for outages

The electricity utilities are obliged to perform risk and vulnerability analyses and devise action plans showing how they will improve reliability of supply in their own networks. The purpose of the provisions is to ensure that electricity utilities take preventive steps to reduce vulnerability in the electricity network and help to meet the Electricity Act's functional requirements stating that power outages must not exceed 24 hours. Ei has issued regulations on the annual reporting of risk and vulnerability analyses in electricity networks, which also means that a report based on the risk and vulnerability analysis and the action plan must be submitted to Ei.

In addition to the functional requirements in the Electricity Act, Ei has also drawn up regulations on which other requirements must be met for electricity transmission to be deemed to be of good quality. Elements of the regulations relating to technical requirements for treeproofing of regional network cables and functional requirements for higher load levels were issued in 2010, while regulations relating to power supply quality requirements were issued in mid-2011. In 2013, these regulations were supplemented with guidelines concerning the number of outages at customer level.

An electricity consumer affected by outages in the electricity supply for at least 12 hours is entitled to compensation from the electricity utility to which the supply is connected – known as outage compensation. This requirement is applicable to outages that fall within the extensive liability of the electricity utility.⁹ This compensation is defined by a template and must be paid automatically. Ei has issued regulations on how an electricity utility should notify its customers of the rules relating to compensation for outages. The Electricity Act also contains provisions on the entitlement to damages from electricity utilities in the event of injury or damage to property or assets.

1.1.3 Electricity network charges for connection and transmission

The Swedish local network is operated by a large number of electricity utilities, where each electricity utility has a monopoly, i.e. sole rights. Ei decides on sole rights in the form of a permit (network concession). In order to ensure that network operators with sole rights do not exploit their monopoly position, Ei decides on company revenues through the revenue cap.

⁹ Incidents within the extensive liability are incidents that the company can reasonably predict and for which the utility companies can be expected to dimension the design and operation of the network.

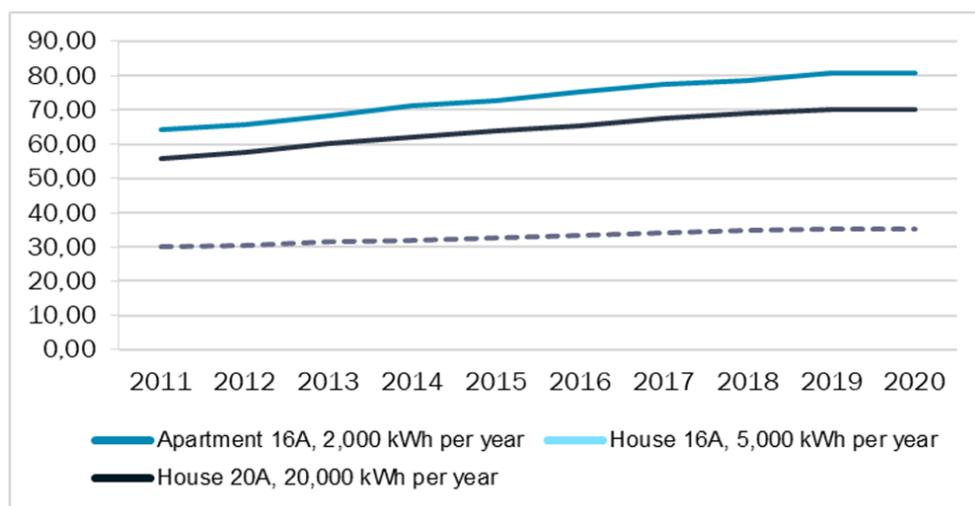
⁹ 1997:857 Chap. 1 section 5 a

According to the Electricity Act, electricity utilities¹⁰ are entitled to charge their customers fees, the so-called electricity network charge, to cover the utility's running costs, such as for operation and maintenance, for example, as well as to provide the electricity utility with a reasonable return on business capital. In order to simulate competition, Ei sets requirements for streamlining running costs as well as for good quality of supply.

According to the Electricity Act, the electricity network charges paid by each customer must be reasonable, objective and non-discriminatory. Reasonableness relates to a utility's total revenues, while objectiveness means that the company's overall charges for a customer category must reflect the costs incurred by the utility for precisely this category. Therefore, companies are allowed to have different charges for different customer categories, such as customers living in houses and customers living in apartments. Non-discriminatory means that companies must not favour one customer category at the expense of another customer category. The electricity network charge frequently comprises a fixed element (subscription charge) and a variable element (electricity transmission charge). The fixed element varies according to the extent of the fuse protection or the power for which the customer has subscribed. The variable element is altered depending on the customer's consumption. For a house with heating that runs on electricity, the fixed and variable elements of the charge are approximately the same. Ei collects data from companies for 15 different typical customer groups to allow it to compare different electricity utilities.

Figure 2 shows how the network charges for different household customer types have developed over the past few years. Between 2019 and 2020, the charges on average increased by 0.1 per cent for apartment customers, decreased by 0.1 per cent for house customers with 16 A fuse protection, and increased by 0.01 per cent for house customers with 20 A fuse protection. In monetary terms in Sweden, this is equivalent to an annual increase of SEK 1, an annual decrease of SEK 5, and an annual increase of SEK 1 respectively.

Figure 2. Actual development of network charges for household customers¹¹



Source: Ei

Customers with low electricity consumption generally have fewer alternatives available to them than customers with high electricity consumption. Most electricity utilities offer only one type of charge, known as a single tariff, to customers with low consumption. Single tariff means that customers pay the same amount no matter when the electricity is used during the day. The alternative to the single tariff is the time of use tariff, where customers pay different amounts depending on the time of day when they use the electricity.

A number of electricity utilities have introduced output-based tariffs for household customers. These involve a smaller fixed charge linked to the size of the fuse protection, which determines the maximum power takeoff. Besides the fixed charge, households are then charged according to how they use electricity over time. For example, different charges may be levied for different times of the day or different times of the year.

Ei's advance decision on electricity network charges for distribution companies

Since 2012, electricity utilities' revenues have been regulated in that Ei establishes a framework in advance for every utility's revenues for a period of four years. This is known as a revenue framework. After the regulatory period, Ei adjusts the company's revenue cap to determine whether it has remained within the pre-determined revenue cap. In 2020, the Swedish Energy Markets Inspectorate (Ei) decided on the revenue caps for the companies after the end of the 2016–2019 regulatory period, and established the deviation decisions for the companies. In the deviation decisions, companies that had a residual deficit from the 2012–2015 regulatory period could transfer it to the 2016–2019 regulatory period.

¹¹ Average value calculated at 2020 price level, not weighted.

The purpose of the revenue frameworks is that electricity utility operations should be conducted efficiently at low cost and that the utilities receive a reasonable return. They aim to ensure that customers pay reasonable prices for the transmission of electricity. The revenue frameworks should help to provide customers with good long-term reliability of supply, while safeguarding the Swedish electricity supply. Electricity utilities should also be given stable, long-term conditions for running network operations.

The revenue frameworks should, as previously reported, cover reasonable costs for running network operations during the regulatory period and provide a reasonable return on the capital required to run the operations, the capital base. Costs for appropriate and efficient operation of network operations with similar objective criteria should be regarded as reasonable costs for running the network operation. The quality of the ways in which the electricity utilities run their network operations must be taken into account when deciding on the revenue framework. The information for calculating the revenue framework is provided in the revenue framework regulation¹².

The Revenue Cap Ordinance states – among other things – that the age of the systems must be taken into account when assessing the company's capital costs. Furthermore, it specifies the economic lifespan, the depreciation period, of the systems. As a direct consequence of the Energy Efficiency Directive,¹³ a provision has also been introduced in the Electricity Act stipulating that in the assessment of the revenue framework, Ei shall also take into consideration the extent to which the network operations are run in a way that is in conformity with or contributes to an efficient utilisation of the electricity network. Ei has also issued regulations providing more detailed rules on assessment of quality, efficiency and costs, including how the age of systems is to be determined.¹⁴

If an electricity utility's revenues deviate from the revenue framework, this will impact on the revenue framework for the subsequent regulatory period. If the company's revenues have been lower than permitted by the framework, this means that the revenue framework for the forthcoming period will be increased by an equivalent amount. If the utility has exceeded the framework instead, the revenue framework for the forthcoming period is reduced. An overcharging supplement

¹² Regulation (2018:1520) on revenue frameworks for electricity utilities.

¹³ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC

¹⁴ The Swedish Energy Markets Inspectorate's regulations (EIFS 2019:4) on what is meant by quality in the network activities, and what is meant by efficient utilisation of the electricity network when establishing a revenue cap, and the Swedish Energy Markets Inspectorate's regulations (EIFS 2019:2) when calculating revenue caps for network operators.

will also be added if the framework has been exceeded by more than 5 per cent, further reducing the revenue framework.

The Electricity Act also includes rules on reassessment of the revenue frameworks during and after the regulatory period, application and decision times, and allocation of revenues to specific periods.

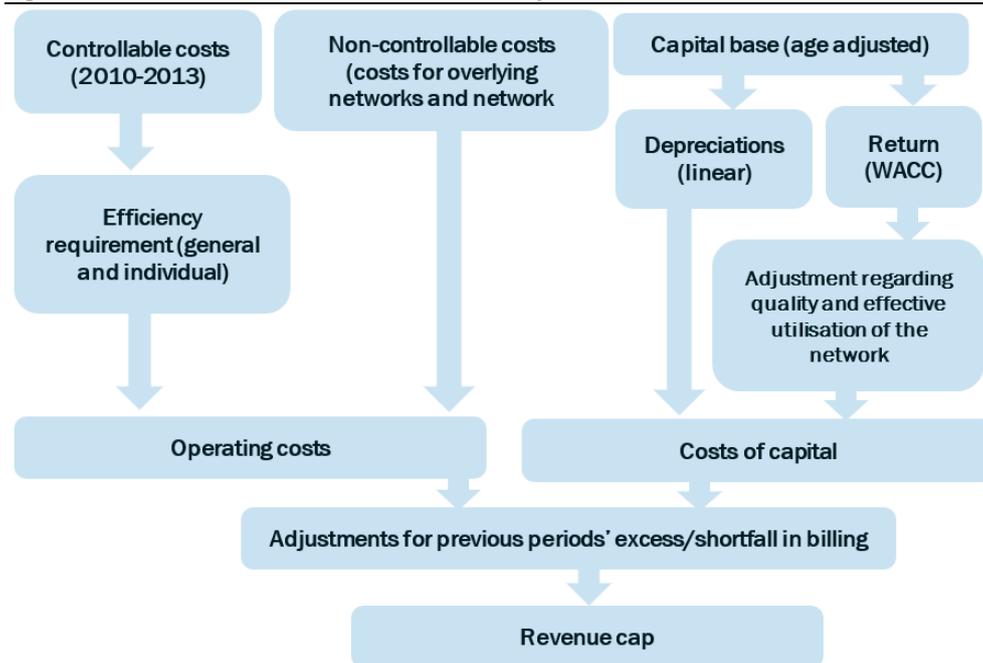
The various elements of the revenue framework

The reasonable costs that are to be covered for the companies through the revenue frameworks are divided into capital costs, as well as running costs that can and cannot be influenced. Figure 3 indicates how the various elements of the revenue framework are interlinked.

Capital cost is the cost of using capital. The capital base forms the foundation for calculating the capital costs. The capital base includes fixed assets such as electricity cables and network stations that electricity utilities use to run their network operations. The cost is made up of two elements: the cost of capital consumption (depreciation), and the cost of capital tied up (return). The capital base is valued on the basis of the present purchase price, and the return is calculated using the actual cost of capital before tax¹⁵. When calculating capital costs, Ei takes into account investments made during the regulatory period in question.

¹⁵ In court proceedings, Ei has granted a cost of capital of 2.35 per cent for the 2020–2023 regulatory period.

Figure 3. Elements in the revenue framework for electricity



The size of the return is also affected by the quality of the network operations and how efficiently the network is utilised. Quality is assessed on the basis of interruptions to transmission. Network losses and load on the network are crucial in the assessment of efficiency. Taken together, these incentives may not increase or decrease the regulatory rate of return by more than one third per year.

Costs that cannot be influenced include costs for network losses, subscriptions to overhead and adjacent networks, connection to overhead and adjacent networks, and costs for public levies. Companies receive full coverage for costs that cannot be influenced.

Examples of costs that can be influenced include costs for operation and maintenance, as well as customer-specific costs for metering, calculation and reporting, for instance. Ei uses the historical costs of the companies as its basis in order to establish the costs that can be influenced for the regulatory period. The regulation includes a streamlining requirement so that customers will benefit from anticipated productivity improvements. The streamlining requirement means an annual reduction in the costs that can be influenced of between 1 and 1.82 per cent, depending on the efficiency of the companies. In 2020, Ei decided on the revenue cap for the companies after the end of the regulatory period for the 2016–2019 regulatory period. Ei has based the figures on the most recent decision for the period when calculating the streamlining requirement.

Proposal for a legislative amendment regarding incentives to enhance overall capital efficiency

In 2020, Ei submitted a proposal for an amendment to the Electricity Act, which would make it possible to introduce incentives in the regulation to drive network operators towards solutions other than traditional network investments when justified, in order to achieve cost-effectiveness in network operations over the long term. The aim of the amendment was to provide the network operators with an incentive to take measures to streamline the cost base of the entire network operations, both capital costs and running costs, not just costs that can be influenced, which is currently the case. The proposal was submitted for consultation during 2020 to March 2021.

Court proceedings during the regulatory periods

Ei made 185 decisions on revenue caps during 2015 prior to the 2016–2019 regulatory period. 81 appeals were submitted to the Administrative Court as a result of these decisions. The most important issue in the cases subject to appeal was the level of the cost of capital, which was established in the decisions at 4.53 per cent¹⁶. The Administrative Court set the cost of capital to 5.85 per cent in December 2016, which meant that the revenue caps decided upon for the 2016–2019 regulatory period would increase by approximately SEK 8 billion.

Ei appealed against the Administrative Court's judgements to the Administrative Court of Appeal, which in November 2017 announced that it would not grant Ei leave to appeal. The decisions were accordingly referred back to Ei. Therefore, in 2018, taking into account the stipulations set out in the Administrative Court's judgement, Ei established the revenue frameworks for the companies, with a cost of capital of 5.85 per cent.

In 2019, Ei made 179 decisions on revenue caps prior to the 2020–2023 regulatory period. Approximately 120 decisions were appealed to the Administrative Court. The main causes for appeal by the companies are in cases in which Ei may apply the Revenue Cap Ordinance when establishing the revenue caps for the network operators, or in the event that the provisions on the cost of capital in the Revenue Cap Ordinance contravene the Electricity Act or the Internal Market in Electricity Directive, and therefore may not be used by Ei. This issue is of significance for large parts of the calculation of the revenue caps. At the end of February 2021, the Administrative Court announced that the provisions on the cost of capital in the Revenue Cap Ordinance may not be used and referred the cases back to Ei. Ei appealed against the judgements of the Administrative Court to the

¹⁶ 4.56 per cent after concession by Ei during the court proceedings.

Administrative Court of Appeal in Jönköping, where the proceedings are still ongoing.

In 2020, the Swedish Energy Markets Inspectorate (Ei) decided on the revenue caps for the companies after the end of the 2016–2019 regulatory period, and then also established the deviation decisions for the companies. Six appeals were submitted to the Administrative Court regarding the decisions after the regulatory period; all appeals have since been withdrawn. The deviation decisions compare the actual revenues of the companies during the period with the revenue cap and then establish the amount that the companies may carry over to the next period, or whether the revenue cap for the subsequent regulatory period should be lowered. In these decisions, Ei rejected the possibility to carry over amounts for unused revenue caps for more than one regulatory period. Around 100 companies have appealed against the deviation decisions.

The level of revenue caps in Table 2 shows the revenue caps that the network operators have applied for, the revenue caps decided upon by Ei, and the revenue caps established after the judicial proceedings for the 2012–2015 and 2016–2019 regulatory periods.¹⁷ In the comparisons between the different regulatory periods, it must be noted that the amounts for the regulatory periods are specified in price levels for different years.

Table 2. Revenue frameworks

Revenue frameworks, SEK billions	Requested amounts	Frameworks decided upon	Frameworks after the review by the court
2012–2015 (price level for 2010)	183	160 ¹⁸	196 ¹⁹
2016–2019 (price level for 2014)	176	164 ²⁰	173 ²¹
2020–2023 (price level for 2018)	- ²²	168	- ²³

Source: Ei

1.1.4 Cross-border issues

The ability to transmit electricity between electricity regions and countries is an important prerequisite for a joint market. Measures are currently being taken to harmonise electricity trading within the EU. In practice, each country must implement EU rules, so-called network code, in order to facilitate and ensure the cross-border transmission of electricity. Ei has a key part to play in this work and is working in partnership with other relevant regulatory authorities in the EU, and in special fora on a regional level. Ei's work on the implementation of a network code is also presented in the report: *New EU regulations for electricity and natural gas – content and implementation*.²⁴

Projects of common interest

One important issue for the member states is to increase reliability of supply, and security for electricity and gas within the EU. To achieve this, a number of infrastructure projects are being highlighted as what are known as Projects of Common Interest, or PCIs. These projects have a specific regulatory framework that aims to facilitate and coordinate permit processes between countries, but also rules that provide project owners with the opportunity to apply for special EU funding in order to facilitate financing. For the 2021–2027 period, there is an amount of EUR 42.3 billion available in what is known as the CEF fund,²⁵ and project owners can apply for this. These projects must help to integrate the market

¹⁸ Svenska kraftnät's revenue framework is not included in the table.

¹⁸ In the court proceedings, Ei acknowledged that in some parts the transition method used had been changed. Among other things, the consequence was that the revenue caps were then raised from approximately SEK 150 billion to SEK 160 billion.

¹⁹ After reconciled information and at the 2014 price level, the SEK 196 billion is equivalent to approx. SEK 201 billion.

²⁰ Ei conceded to a changed cost of capital from 4.53 to 4.56 per cent in the court action, and the revenue frameworks then increased from 163 to 164 billion.

²¹ On application by the companies for a correction of the capital base, Ei reconsidered a number of revenue frameworks during the regulatory period of 2016–2019. The reconsidered revenue frameworks led to the revenue frameworks increasing from 172 billion to 173 billion.

²² From and including the regulatory period of 2020–2023, companies do not apply for amounts, all companies are allocated a revenue framework based on what the calculation allows, and Ei adjusts the calculation to the period based on the actual conditions.

²³ It is not possible to identify a framework according to a review by the court when judicial proceedings are ongoing.

²⁴ Ei R2018:10

²⁵ Connecting Europe Facility

and increase competition, lead to greater security of supply, and reduce carbon dioxide emissions.

Ei has a number of tasks to perform in accordance with the regulatory framework, including participation in the evaluation of the projects applying to become PCI projects, reporting on the progress of the projects, and making decisions about CBCA²⁶.

Sweden currently has two PCI projects for electricity, one of which is the 400 kV power line between Ekhyddan, Nybro and Hemsjö, which is provisionally estimated to be commissioned in 2025. This project aims to increase the reliability of the transmission network and regional networks, and to safeguard the electricity supply to the NordBalt DC link between Sweden and Lithuania. The project is also helping to increase the transmission capacity between the Swedish bidding areas SE3 and SE4, and to reduce transmission losses in the Swedish electricity network by approximately 275 GWh/year, which in turn will result in a reduction of environmental impact in the integrated European electrical energy system.

The second PCI project for electricity is a 400-kV cable from Messaure in the northern part of Sweden to Keminmaa in Finland. This project is being planned by Svenska kraftnät, together with the Finnish transmission network operator Fingrid, and commissioning is planned for the end of 2025.²⁷ The planned power line between Sweden and Finland is intended to result in great benefits for the entire Nordic electricity market, increase reliability of supply in Finland, further integrate Sweden into the Nordic electricity system, and meet future needs for reliable electricity supplies. The proposal for the expansion consists of an approximately 180-kilometre route between the Messaure power plant in Jokkmokk municipality and the Finnish border on the Torne River near Risudden, Övertorneå municipality. In total, the length of the complete overhead power line is estimated to be 380 kilometres, and it will run parallel to the existing transmission network cable on the same route.

1.1.5 Compliance with electricity legislation

Ei's work as a network authority includes supervising companies to ensure that they are meeting their obligations in accordance with electricity legislation, both the national rules and the EU rules. The Electricity Act²⁸ stipulates that Ei is also a regulatory authority in accordance with the Regulation on conditions for access to the network for cross-border exchanges in electricity²⁹. According to Ei's

²⁶ Cross-Border Cost Allocation

²⁷ <https://www.svk.se/utveckling-av-kraftsystemet/transmissionsnatet/transmissionsnatsprojekt/aurora-line/>

²⁸ 1997:857 Chap. 12 section 1, fourth paragraph.

²⁹ Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity.

instruction, unless otherwise specifically stated, the authority must also fulfil the tasks pursuant to the EU's Internal Market in Electricity Directive.³⁰

According to the Internal Market in Electricity Directive³¹, the national regulatory authorities must comply with and implement the legally binding and relevant decisions made by the Agency for the Cooperation of Energy Regulators³² (ACER) and the European Commission. To make it possible for Ei to comply with the Commission's decisions, provisions have been introduced in the Electricity Act³³ and the Act on certification of transmission network companies for electricity³⁴.

According to the Electricity Act,³⁵ Ei has the right to receive the information and view the documents needed for supervision upon request. Ei may issue injunctions as necessary in order to ensure compliance with the regulations and conditions included in the supervision³⁶. Penalties may be applied in respect of such injunctions.

³⁰ Regulation (2016/742) with instructions for the Swedish Energy Markets Inspectorate

³¹ Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market in electricity and amending Directive 2012/27/EU.

³² ACER is a collective authority for the EU's regulatory authorities for energy, and Ei is one of its members.

³³ 1997:857 Chap. 12 section 1 b.

³⁴ 2011:710 Chap. 3 section 4 and Chap. 4 section 3.

³⁵ 1997:857 Chap. 12 section 2

³⁶ 1997:857 Chap. 12 section 3

1.2 Wholesale market for electricity

The Swedish wholesale market for electricity is part of an integrated Nordic-Baltic market through transmission links. The Nordic-Baltic network in turn is interconnected with the European electricity network. Operational management of the electricity network takes place in the relevant country, where the system operator is responsible for ensuring the constant equilibrium of the national electricity network.

Swedish electricity production is mainly based on nuclear power and hydropower. Electricity consumption is influenced by relatively large levels of power-intensive industry, along with the fact that many households are heated using electricity. Trading on the wholesale market mainly takes place on the Nord Pool electricity exchange.

Figure 4 The Nordic-Baltic bidding areas



Source: Ei

1.2.1 Monitoring of price development, transparency and competition

Trading in electricity

The Swedish electricity trading system took on its current form at the time of deregulation in 1996, and is essentially an energy-only market. On an energy-only market, producers receive payment on a per-hour basis for the electricity they sell, and not for installed capacity.

The electricity trading system can be divided into four submarkets: a hedging market, a day-ahead market, an intraday market, and finally a balancing market, see Figure 5.

Figure 5. The electricity trading system



Source: Ei

There are organised marketplaces for trading on the various submarkets. Besides trading in these marketplaces, it is possible for stakeholders to trade bilaterally. The prices in the organised marketplaces act as reference prices for the bilateral trade.

The hedging market

When trading electricity, market stakeholders need to manage the financial risks inherent in the variation of prices both over time and between different geographical regions. Producers need to do this in order to safeguard their revenues at a certain level, but it is also necessary for consumers as they wish to achieve a certain level of predictability for their future electricity costs.

There are a number of ways in which to manage and hedge the price of electricity supplies. Most markets use various forms of financial-futures contract to handle the underlying risk in respect of future price levels. "Financial", in this regard, means that the contracts are not linked with any physical supply of energy; they are solely settled economically against a settlement price. Contracts may include different periods (weeks, months or years, for example) and have varying profiles as well (for example, peak and base load contracts). The large volumes of financial

contracts on the Nordic market are linked with the system price³⁷ as a settlement price.

Different types of instruments are used in different parts of the EU for hedging the specific price risk for an individual bidding area. Transmission rights are the most common instrument for managing risk in continental Europe, while risk in the Nordic Region is primarily managed using what are known as *Electricity Price Area Differentials* (EPAD). The buyer of an EPAD contract hedges the difference between the system price and the price in a specific bidding area. This may, for example, be an electricity region in which the buyer has its physical obligations, such as supply of electricity. In the same way, a producer can sell EPAD contracts in order to hedge production in an electricity region.

Essentially, hedging in Sweden and the rest of the Nordic Region takes place when stakeholders trade futures contracts, sometimes in combination with EPADs. These contracts can be traded bilaterally, via brokers, or on trading platforms. For the Nordic Region, both Nasdaq Commodities and EEX arrange trading in and settlement of financial contracts. Contracts that have been traded bilaterally are generally settled at a clearinghouse. Settlement means that the parties have the clearinghouse as counterparty. This way, the clearinghouse takes over the counterparty risk. In the current situation, it is possible to hedge production or consumption by trading in financial electricity contracts up to 10 years ahead with Nasdaq Commodities, while EEX offers financial contracts up to 6 years ahead. Trading takes place constantly and is priced according to *pay-as-bid*³⁸. Participation in the financial market is voluntary, and hence stakeholders themselves choose which contracts are appropriate to use in order to manage their risk.

The day-ahead market

The day-ahead market, frequently known as the spot market, is the primary market for planning the electricity supplies of tomorrow. Seven electricity exchanges in north-western Europe currently work in partnership in order to calculate market prices and volumes of trade for day-ahead trade. The calculation method, price linking algorithm, used by the electricity exchanges, is known as Euphemia³⁹. The fact that the electricity exchanges calculate stock prices jointly means that they calculate flows over wider areas so that available production and

³⁷ Nord Pool Spot calculates the reference price used in the financial trade. This is known as the system price. Norway, Denmark, Sweden and Finland constitute one bidding zone in the calculation, while the Baltic States, Poland, Germany and the Netherlands constitute individual regions in the same way as in the calculation of bidding area prices. The system price is calculated as if there were no restrictions in transmission capacity between the four Nordic countries.

³⁸ *Pay-as-bid* means that the buy and sell bids accepted are settled at the price submitted by the stakeholder in the market.

³⁹ Pan-European Hybrid Electricity Market Integration Algorithm

transmission capacity are utilised as effectively as possible. The exchanges take it in turns to calculate the prices, so only one electricity exchange at a time calculates the prices for the collective area.

According to EU rules,⁴⁰ electricity exchanges require a permit to operate as an electricity exchange in an electricity region. EMCO (Nord Pool), EPEX Spot, and Nasdaq Commodities may operate as an electricity exchange on the day-ahead market in Sweden. In the current situation, only EMCO and EPEX Spot have an established operation, pending the completion of the necessary arrangements for more nominated electricity market operators.⁴¹ EMCO's day-ahead market, also known as Nord Pool day-ahead, is the trading platform for the majority of the physical electricity trading in the Nordic Region and the Baltic States. Approximately 90 per cent of all electricity consumed in the Nordic Region is traded on Nord Pool (and integrated in the EU-wide market link), while the remaining 10 per cent is traded by means of bilateral agreements.

When trading on EMCO's day-ahead market, stakeholders must submit their buy bids and sell bids to the electricity exchange by 12:00. These bids are applicable for the following day and are submitted for each whole hour. The bids specify how much the stakeholder wishes to buy or sell, at what prices, and in which electricity regions. In the next step, when all the bids have been received, the electricity exchange adds together all the bids hour by hour in a buy stage and in a sell stage. When buy and sell bids are agreed upon, the market price and the volume to be bought and sold are established. All sell bids that are lower than the established price must produce and sell their electricity on the market in that hour, and all buy bids above the established price have to buy electricity in the hour in question. This is usually termed acceptance of the buy bids and sell bids, and it means that plants prepared to sell at a low price or irrespective of price are used first, and that higher bids are accepted as required. EMCO must publish the prices for the following 24-hour day by 13:00.

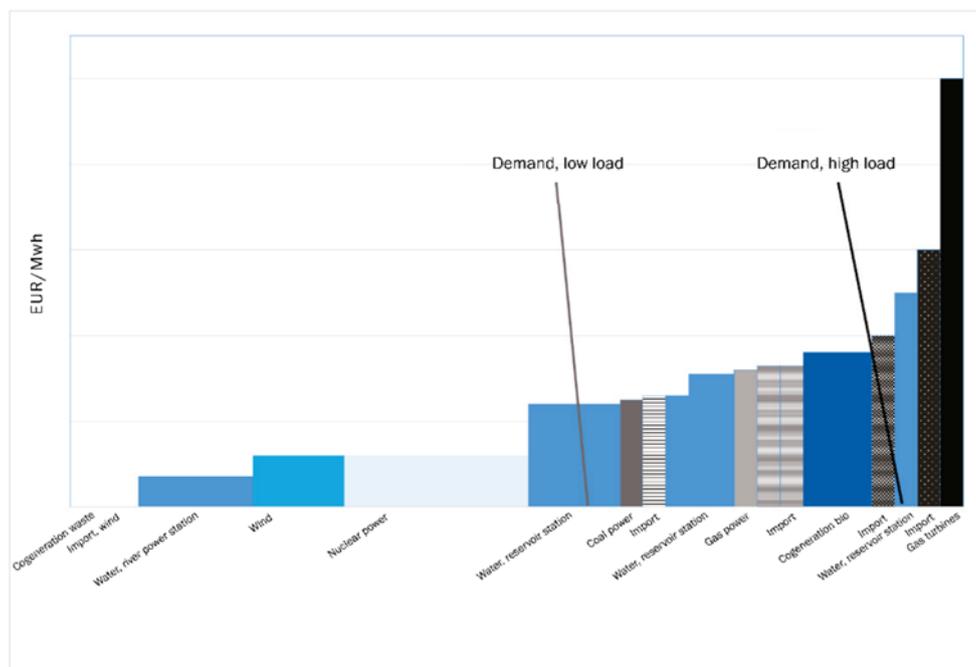
Marginal pricing is applied on the day-ahead market, which means that all accepted stakeholders are able to trade at the established market price, regardless of their initial bids. There is no distinction made between the different production technologies. Hence the bids compete on equal terms regardless of the type of production offered on the market.

⁴⁰ Commission guideline CACM (Capacity Allocation and Congestion Management), articles 2.23 and 4-6.

⁴¹ Commission guideline CACM facilitates competition between exchanges. Three nominated electricity market operators are currently authorised to trade in electricity on the day-ahead market: Epex Spot, Nasdaq Commodities, and EMCO

Figure 6 is a basic diagram showing the price formation on the spot market and the order in which various types of power are accepted. It is worth noting that hydropower producers normally submit bids at several different price levels. This is because a hydropower producer that has access to reservoir capacity has the opportunity to choose between production today and production at a later date, depending on the price paid for its capacity. If the producer expects a higher price in future, it will probably refrain from producing electricity and store the water in the reservoir instead. Another significant element in the supply curve is the import option, which varies in terms of both scope and price from hour to hour.

Figure 6. Price formation in Sweden



Source Ei

The electricity market is divided into electricity regions in order to manage transmission restrictions. When trading capacity is sufficient between electricity regions, the price is the same in these regions and they will form a collective price region. When trading capacity is insufficient, separate price regions with different prices occur. A price region may therefore comprise one or more electricity regions.

Trading on the day-ahead market accounts for much of the physical trade and price formation in the Nordic Region and thus Sweden. This market is therefore deemed to be key to stakeholders' earning capacity.

The intraday market

According to EU rules,⁴² electricity exchanges require a permit to operate as an electricity exchange in an electricity region on the intraday market. Currently, EMCO (Nord Pool) and EPEX Spot may operate as an electricity exchange in Sweden.⁴³

Trading on EMCO's intraday market opens at 14:00 the day before, and closes one hour before the hour of supply. The bids are matched continuously when a counterparty is found, which means that trade takes place between two parties and with no price impact on other transactions.

The intraday market is an adjustment market that gives stakeholders the opportunity to trade in balance up to one hour before the operating hour if conditions have changed after the closing of the day-ahead market. For example, the temperature may have deviated from what was forecast, affecting the need for heating and hence consumption. The intraday market is used primarily by balance providers, that is, the companies that have undertaken to accept the economic risk for imbalances in the market, even though being a balance provider is not a requirement to be allowed to participate in the intraday market.

The volumes on the current intraday market in the Nordic Region are relatively small compared with the day-ahead market. The intraday market has a greater part to play on other European markets than in the Nordic Region as many stakeholders conduct more of their trade there.

In June 2018, the XBID price linking algorithm was introduced, which is an EU-wide price linking system for intraday trading. According to the regulatory framework, intraday trading must be continuous, with implicit allocation of transmission capacity.⁴⁴

The balance market

Svenska kraftnät has worked together with the other Nordic system operators to establish the balance market in order to guarantee their need for real-time regulation resources in a cost-effective way. The balance market comprises marketplaces for automatic and manual reserves. A change is currently underway

⁴² Commission guideline CACM (Capacity Allocation and Congestion Management), articles 2.23 and 4-6.

⁴³ Commission guideline CACM facilitates competition between exchanges. Two nominated electricity market operators are currently authorised to trade in electricity on the intraday market: EpeX Spot and EMCO.

in the Swedish balance market due to adaptation to EU rules.⁴⁵ In general, the balance market currently works as follows:

Svenska kraftnät procures the automatic reserves. The pricing for automatic reserves includes two components: a capacity-related component and an energy-related component. The capacity element is settled according to the *pay-as-bid* principle.

The Nordic regulating power market is the market for manual reserves. Voluntary bids for upward and downward regulation are submitted to the regulating power market, commencing 14 days before the start of the supply day and ending 45 minutes before the supply hour. Only balance providers submit bids.

Marginal pricing is applied on the regulating power market when bids are called off for reasons relating to balance. This means that all activated upward regulation bids have the same price as the most expensive activated bid. Hence stakeholders have an incentive to offer their production at a flexible cost/alternative cost, in exactly the same way as on the spot market. This paves the way for cost-effective allocation of balance resources. Downward regulation for reasons relating to balance is settled at the lowest called-off downward regulation bid.

Bids on the regulating power market are submitted for each individual regulating object and must include information on volume (MW), price (euro/MWh), information on geographical location, and how quickly a called-off bid can be fully activated. Regulating objects may be in the form of production resources or consumption resources. Bids are ranked in order of price, and the cheapest bids are called off first. The current scheme means that the smallest bids that may be placed amount to 5 MW (in electricity region SE4) or 10 MW (in electricity regions SE1, SE2 and SE3). Control objects can be aggregated into one single control object within an electricity region in the cases where they are less than the minimum permitted bid size on their own. By way of comparison, it can be stated that the minimum bid size on the day-ahead and intraday markets is 0.1 MW. The maximum permitted price for upward regulation bids is 5,000 euro/MW.⁴⁶

Sometimes there are transmission restrictions, and sometimes it may take time before a regulating object is fully activated. In which case, deviations from the "lowest bid first" principle will then be necessary, and this procedure is known as special regulation. Bids called off for the special regulation do not indicate pricing on the regulating power market and are settled according to the *pay-as-bid*

⁴⁵ Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline for electricity balancing (balance Code).

⁴⁶ Information on XBID can be found on the Nord Pool website

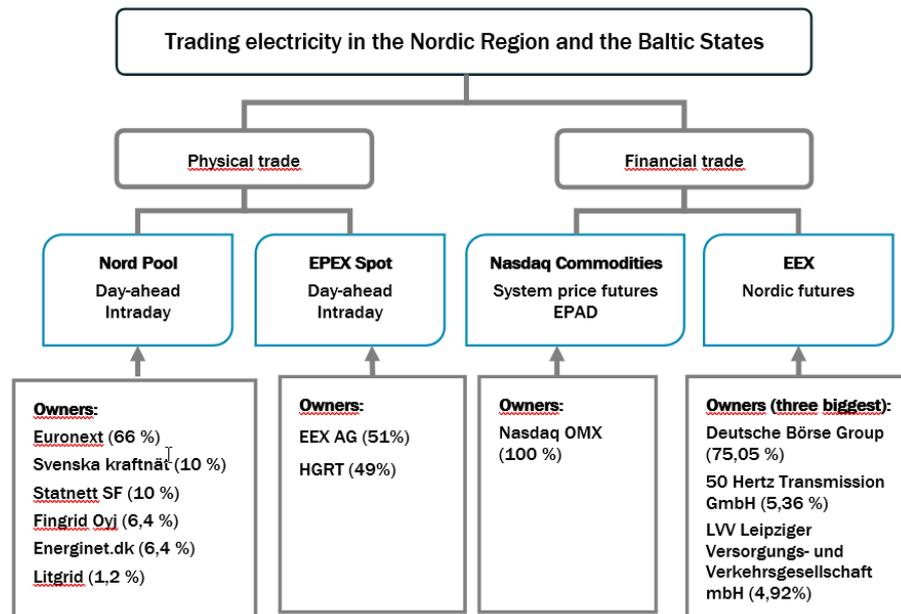
principle. The prices for upward and downward regulation are used in the subsequent balance settlement.

In 2019, Ei and other relevant regulatory authorities reached decisions on a number of new methods and terms and conditions for the balancing market in accordance with EU rules.⁴⁷ These new methods and conditions will be implemented in the coming years and will fundamentally change the current Swedish balancing market.

Trading platforms for electricity

On the EMCO (Nord Pool) physical trading platform, a total of 995 TWh of electricity was traded in 2020, of which, 717.9 TWh of the electricity was traded via the day-ahead market within the Nordic Region and the Baltic States. The total intraday trading amounted to 26 TWh. There were 360 active Nord Pool stakeholders in 2020 from 20 countries.⁴⁸ In Sweden, on Epex Spot, 2.94 TWh of electricity was traded via the day-ahead market, and 0.77 TWh via the intraday market⁴⁹.

Figure 7. Trading platforms for electricity in the Nordic-Baltic market



Source: Nord Pool⁵⁰, EPEX Spot, Nasdaq Commodities and EEX

⁴⁷ Full terms and conditions for participation in the regulating power market can be found at www.svk.se.

⁴⁷ A complete list of the methods and terms and conditions decided upon is available at www.ei.se.

⁴⁸ <https://www.nordpoolgroup.com/message-center-container/newsroom/exchange-message-list/2021/q1/nord-pool-announces-2020-trading-figures/>

⁵⁰ Epex Spot opened day-ahead trading and intraday trading at the start of June 2020 and at the end of May 2020 respectively.

⁵⁰ The Nordic system operators, together with the Lithuanian operator (Litgrid), own a total of 34% of Nord Pool through a joint holding company.

Market sharing and countertrading to deal with bottlenecks

The need to transmit electricity within Sweden and the Nordic Region is largely affected by variations in the availability of hydropower, as well as seasonal variations in consumption. Normally, transmission restrictions in the Swedish transmission network are dependent on extensive hydropower production in the north, which leads to a major need to transmit this electricity southwards; while at the same time, the transmission capacity between bidding areas is restricted. Transmission restrictions also occur in situations where there is a great deal of transmission towards the north, from Denmark and the continent to the west coast of Sweden and on to southern Norway.

Two methods are used in Sweden and the Nordic Region to deal with transmission restrictions: market sharing and countertrading.

Market sharing means that the electricity market is divided into submarkets, known as electricity regions (these are also known as spot price regions or bidding zones), see Figure 4. The prices in the individual regions are determined by production and consumption within each zone as well as by power transmission to and from adjacent regions. When two adjacent electricity regions have the same price, they form one price region. It is not uncommon for all of Sweden's for electricity regions to form a joint price region, particularly during low-demand hours. Price regions that extend over Danish, Swedish and Norwegian electricity regions are also common. Sweden has been divided into four electricity regions since 2011. When there is insufficient transmission capacity between electricity regions, the prices in the regions will differ. The revenues received by Svenska kraftnät from the transmission of electricity from low-price areas to high-price areas, known as bottleneck revenues, are earmarked for reinforcement of the transmission network.

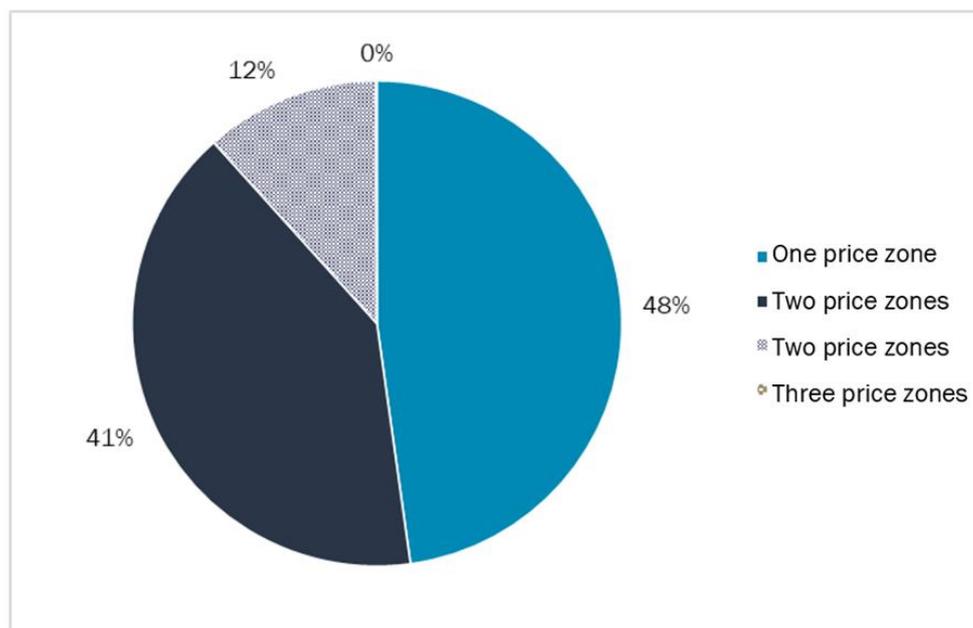
Svenska kraftnät is also able to deal with transmission restrictions by means of countertrading. This means that Svenska kraftnät pays for increased electricity production in the shortfall region and/or reduced electricity production in the surplus region. Countertrading costs increase the costs for Svenska kraftnät, thereby signalling that the network needs to be reinforced. One prerequisite for being able to countertrade is that there are production resources available in the region in question.

Sweden constituted one or two price regions throughout most of 2020

Figure 8 below shows how Sweden was a uniform price region for 48 per cent of the time during 2020. Most price differences can be found between southern (electricity regions SE3 and SE4) and northern (electricity regions SE1 and SE2) Sweden. In total, Sweden was divided into two price regions for 41 per cent of the time. There were price differences between northern and southern Sweden for the

majority of that time. These price differences occur primarily during periods of transmission restrictions or production losses, particularly in electricity region SE4. The price differences between bidding areas SE3 and SE4 are therefore expected to decrease when the new Sydvästlänken [South-West Link] transmission network cable is commissioned in 2021 as it increases the output power that can be transmitted from bidding area SE3 to bidding area SE4 in southern Sweden.⁵¹

Figure 8. Proportion of the time in 2020 when Sweden was divided into 1-4 price regions



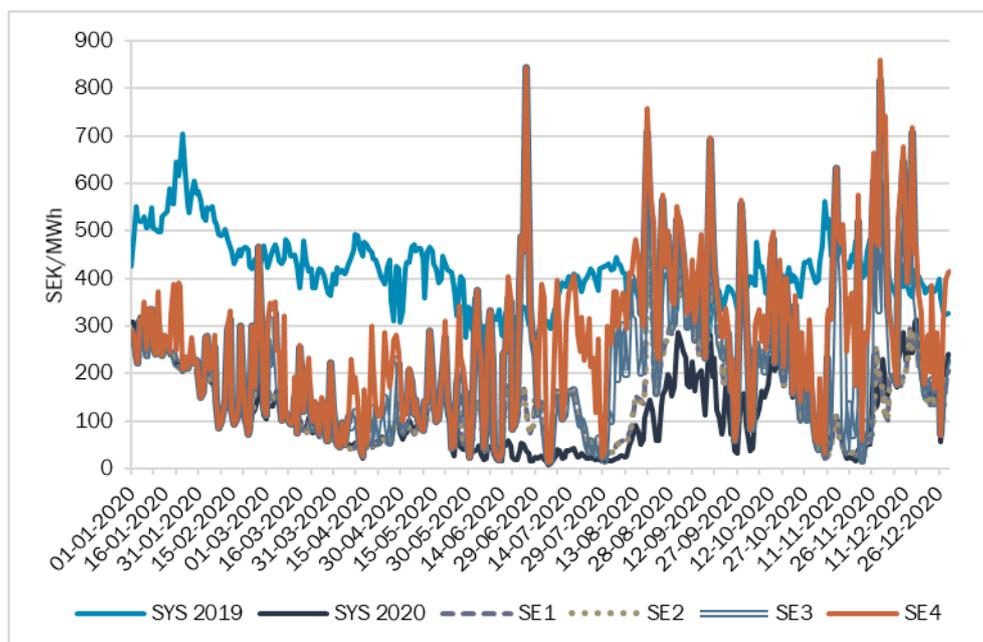
Source: Nord Pool: Ei's own calculation on the basis of data

Low prices on the day-ahead market during the year

As shown by Figure 9 the system price for 2020 was at relatively low levels compared with 2019, and a negative system price was recorded for the first time. Spot prices for bidding areas SE1–SE4 were also below 2019 levels for large parts of the year. The highest mean daily price was recorded in SE1 and SE2 on 15 January, when the price in both bidding areas was SEK 674.31/MWh. In SE3 and SE4, the highest mean daily price for each was recorded on 25 June and 30 November respectively (SEK 842.82/MWh in SE3, and SEK 860/MWh in SE4). The lowest mean daily price for the year was recorded on 5 July, when all Swedish bidding areas recorded SEK 11.84 per MWh.

⁵¹ During the full-scale tests with the plants connected to the transmission network, a need emerged to correct shortcomings in the software for the power electronics before the plants can become fully operative, and commissioning has therefore been delayed until 15 August 2021.

Figure 9. Hourly rate prices on the day-ahead market during 2020, SEK/MWh



Source: Nord Pool

Low electricity consumption and increased wind power production

Total consumption of electricity, including transmission losses, was 134.6 TWh in 2020, representing a decrease of 3.07 per cent on 2019. Electricity consumption was the lowest since 1986⁵² and remained relatively low compared to levels in the first decade from 2000.

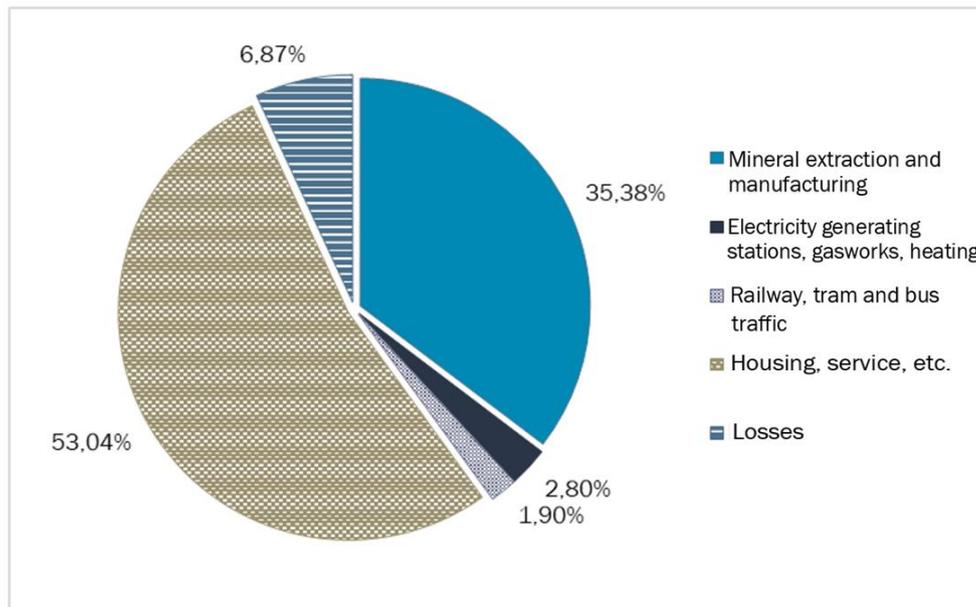
More than half of the electricity, just over 75.7 TWh, was used within the housing and service sector, which was a slightly higher proportion compared with 2019. In 2020, industrial electricity consumption amounted to just over 47.6 TWh throughout the year, thus accounting for approximately 35 per cent of total electricity consumption.

A contributory factor to the low consumption was the high annual average temperature of 7.6 degrees, which was the highest so far measured in Sweden since nationwide observations began around 1869.⁵³ Figure 10 below shows electricity consumption divided according to region.

⁵² In 1986, total final electricity consumption in the country (including losses) amounted to 129 TWh

⁵³ SMHI <https://www.smhi.se/klimat/2.1199/aret-2020-rekordvarmt-ar-1.166700> [retrieved 27 May 2021].

Figure 10. Electricity use 2020 divided into consumption areas.



Source: Statistics Sweden

Electricity production in Sweden decreased by approximately 3 per cent in 2020 compared with the previous year. When the figures for the year were added together, net yields indicated an export of 25 TWh, which is slightly lower compared to the record year of 2019. Wind power production increased by a further 39 per cent and amounted to 27.6 TWh during 2020. This type of power accounted for just over 17 per cent of total electricity production, which is an increase of 4 percentage points compared with 2019. Nuclear energy generation decreased by 26 per cent, and accounted for 30 per cent of total electricity production. Table 3 below gives a summary of Sweden's energy balance during 2011–2020.

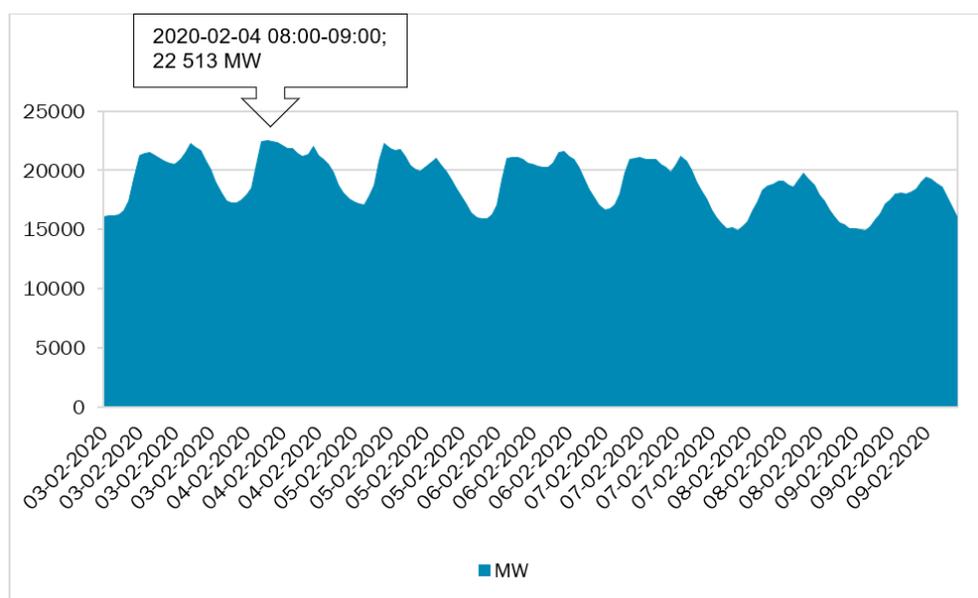
Table 3. Sweden's electricity balance in TWh, 2011-2020. Negative values indicate export

Electricity supply	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Production in Sweden	146.8	162.1	149.7	151.2	158.5	151.4	159.3	158.5	164.9	159.6
Wind power	6.1	7.2	9.9	11.5	16.6	15.4	17.5	16.6	19.9	27.6
Hydropower	66.0	78.0	61.0	64.2	74.0	61.2	63.9	61.0	64.6	71.2
Nuclear power	58.0	61.4	63.6	62.2	54.3	60.5	63.0	65.8	64.3	47.3
Other cogeneration	16.7	15.5	15.2	13.3	13.6	14.3	14.9	15.0	15.6	12.7
Electricity consumption in Sweden	139.6	142.5	139.7	135.6	135.9	139.7	140.4	141.3	138.7	134.6
Network losses	10.2	11.4	10.5	10.2	10.4	10.7	11.1	11.0	8.7	9.3
Import	12.5	11.7	12.7	13.9	9.3	14.3	11.9	12.2	9.1	11.8

Source: Swedish Energy Agency and Statistics Sweden

The highest electricity consumption in 2020 occurred at 08:00–09:00 on 4 February when it amounted to 22,513 MW, see Figure 11. This is 3,000 MW lower than the previous year's record of 25,103 MW, which was recorded on 30 January, and 6,500 MW lower than Sweden's highest electricity consumption to date, which was recorded on 5 February 2001, when it amounted to 27,000 MW.

Figure 11. Power takeoff in week 6 of 2020, MW



Source: Nord Pool

Competition in the wholesale market

Ei's report from 2014 on the division of electricity regions indicated that the conditions for competition in the wholesale market were good.⁵⁴ In all material respects, Ei's assessment of the conditions described also applied for 2020.

The price was unchanged for large parts of the year in several of Sweden's bidding areas, and Ei's analysis is that there are therefore no individual stakeholders that can exercise market power in the day-ahead market and intraday market. During periods with transmission restrictions when bidding areas become their own price regions, individual stakeholders in the northernmost bidding area SE1 and individual stakeholders in the southernmost bidding area SE4 move into a position that gives them the opportunity to exercise market power⁵⁵ in a submarket. In electricity region SE1, there is one producer whose production dominates the region. However, to a very large extent, electricity regions SE1 and SE2 form one joint price region, which limits the opportunity for an individual stakeholder to

⁵⁴ Evaluation of the effects of division into electricity regions, Ei R2014:08

⁵⁵ Market power can be described as a stakeholder's ability to influence the prices at which a product is traded on the market. The ultimate form of market power prevails when one stakeholder has a monopoly position and is therefore alone in a certain market and can act without competition from other stakeholders.

exercise market power. In electricity region SE4, with only one large producer, the situation is similar.

Swedish electricity production is dominated by a small number of major stakeholders. Vattenfall alone accounts for over 40 per cent of production, and together, the three largest stakeholders (Vattenfall, Fortum and Uniper⁵⁶) account for just over 73 per cent.⁵⁷ The three biggest stakeholders also own a large majority of Swedish nuclear power, in various configurations.

Whenever competition on the electricity market is assessed, it is necessary to take into account the fact that Swedish electricity regions rarely form isolated price regions. As a rule, a single price region extends over several national borders, which means that an isolated study of competition in the Swedish electricity regions risks missing how the electricity market operates in practice.

However, Ei is of the opinion that the competitive situation is acceptable since electricity region SE4 frequently forms a joint price region with adjacent Swedish and Danish electricity regions, reducing the market power of individual stakeholders. The new South-West Link transmission network cable, which is planned to be fully operational in 2021, will also improve the situation. With the entire link fully operational, electricity transmission capacity between central and southern Sweden will increase by up to 25 per cent.⁵⁸

Changes in competition between physical electricity trading platforms

A new group of EU regulations has come into force over the past few years. The EU regulation establishing a guideline on capacity allocation and congestion management (the CACM guideline) introduced a regulatory framework for competition between electricity exchanges in the day-ahead and intraday markets within the same electricity region. In March 2017, Ei approved Svenska kraftnät's proposal for an arrangement that would allow a number of nominated electricity market operators to be active simultaneously in the Swedish electricity regions. The implementation of these arrangements began at the end of 2019 and was completed in 2020.

All day-ahead and intraday trading in the Nordic-Baltic bidding areas was previously handled by EMCO (Nord Pool) with no competition from other exchanges. Epex Spot also began to offer trading on both markets from the middle

⁵⁶ Fortum has owned 76.1% of Uniper's shares since 31 December 2020.
<https://ir.uniper.energy/websites/uniper/English/1300/shareholder-structure.html> [retrieved 1 June 2021]

⁵⁷ Source: Svenska kraftnät

⁵⁸ Source: Svenska kraftnät

of 2020, and Sweden now has a market subject to competition for electricity market operators in both the day-ahead and intraday markets.

Sweden has already decided that Nasdaq Commodities may also conduct exchange trading for physical wholesale energy products in the Swedish bidding areas on the day-ahead market. Nasdaq Commodities has not yet started its operations.

Opportunity for hedging against risks

Svenska kraftnät's bidding area boundaries are divided into three so-called capacity calculation regions: Nordic region, Hansa region, and Baltic region. All Swedish internal bidding area boundaries, and bidding area boundaries between Sweden and Denmark as well as Sweden and Finland, are included in the Nordic region. The bidding area boundary between Sweden and Poland (Swepol Link) is included in the Hansa region, and the bidding area boundary between Sweden and Lithuania (Northern Baltic) is included in the Baltic region⁵⁹.

The EU regulation establishing a guideline on forward capacity allocation (FCA) entered into force in 2016⁶⁰. Since then, Ei has been in dialogue with the other regulatory authorities affected in the three capacity calculation regions in order to analyse how the FCA (Forward Capacity Allocation) can be implemented.

In 2017, the regulatory authorities evaluated the risk hedging options in accordance with Article 30 of the FCA. The investigation and the subsequent consultation showed that price hedging in Swedish bidding areas takes place through EPAD contracts, among other things. On average, the price in EPAD contracts is slightly higher in SE4 compared with the rest of Sweden. The turnover in EPAD contracts is generally limited in SE4 as there are few producers that issue these. The overall evaluation resulted in the price hedging options being considered nevertheless adequate in Swedish bidding areas, and no further measures were taken⁶¹.

FCA requires an evaluation of risk hedging options every four years. In 2021, Ei will again carry out an analysis of the risk hedging options in Swedish bidding areas and make decisions on any necessary measures.

⁵⁹ Source: Svenska kraftnät

⁶⁰ Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation.

⁶¹ Evaluation of hedging options for the Swedish electricity market – for consultation in accordance with the FCA regulation, Swedish Energy Markets Inspectorate.

Transparency Regulation increases transparency in the electricity market

The purpose of the Transparency Regulation⁶² is to increase transparency in the energy market by ensuring that information from market stakeholders reaches everyone concerned in an effective way. Information to be reported according to the regulation includes, among other things, physical restrictions on networks, production and consumption. This information is collated in a transparency platform run by the European Network of Transmission System Operators for Electricity, ENTSO-E⁶³, and can be accessed by the general public. The regulation was adopted in 2013, and reporting began in January 2015. Ei's role is to ensure that there is compliance with the Transparency Regulation in Sweden.

Ei performs a regular review of information published by stakeholders on inaccessibility in production, consumption, and transmission. As part of its monitoring, Ei has been in contact with several companies even though the supervision did not result in any notifications to companies of further action during 2020.⁶⁴

Development of the wholesale market in the Nordic Region

Together with other regulatory authorities, Ei has actively participated in working groups within ACER and CEER in order to address such issues as the developments in the wholesale market and transmission operations in Sweden and the Nordic countries, as well as the integration of the Nordic market in the rest of the EU. Ei has also addressed wholesale market issues in collaboration with other Nordic regulatory authorities in the cooperation body NordREG (Nordic Energy Regulators), as well as with other regulatory authorities in the capacity calculation regions in which Ei is a member. The work regarding the wholesale market for electricity has, during the year, primarily revolved around follow-up of capacity calculation and the allocation of transmission network capacity, as well as collaboration and exchange of information on the implementation of the EU regulations CACM, FCA, EB⁶⁵ and SO⁶⁶.

Collective Nordic balance regulation

In the Nordic region, balance regulation⁶⁷ has been handled in coordination and largely jointly by Nordic system operators for a decade or so. This means that

⁶² Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets

⁶³ European Network of Transmission System Operators - Electricity

⁶⁴ Ei PM2021:02 Market monitoring and surveillance 2020.

⁶⁵ Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

⁶⁶ Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

⁶⁷ Balance regulation is performed in order to correct frequency deviations – to restore the instantaneous balance in the power system, that is.

balance regulation is handled as if the Nordic synchronous region⁶⁸ were a single control region⁶⁹. Furthermore, there is a common settlement function for Sweden, Finland and Norway. However, each national system operator retains responsibility. There is also a collective market for regulating power where the most effective resources in the Nordic Region are used for upward regulation or downward regulation.

In 2019, Denmark also announced that it would be joining the joint settlement function, with a start date in 2021.

Continued efforts to increase European harmonisation

According to the EU's Internal Market in Electricity Directive, the regulatory authorities have an obligation to monitor how entry to cross-border infrastructure is managed by system operators. The common Nordic market is well established, which means that it is primarily a question of changes that require the attention of the regulatory authorities. Ei works actively with other Nordic regulatory authorities in NordREG in order for issues concerning the wholesale market to be discussed at the Nordic level, and not just nationally. Ei is also positive and supportive with regard to developing internal rules and practice in the Nordic countries towards increased harmonisation.

⁶⁸ Electricity systems whose subsystems are connected together with an alternating current link, thereby providing a joint frequency.

⁶⁹ A control region is an integrated part of the interlinked system, which is operated by a single system operator and must include interconnected physical loads and/or any consumption units.

1.3 The end-customer market

The Swedish end-customer market for electricity has been subject to competition since 1996. There is no price adjustment. There are approximately 5.5 million electricity customers in Sweden, approximately 4.7 million of which are household customers.

1.3.1 Monitoring of price development, transparency and competition in the market

Many electricity suppliers – but some only operate locally

According to EIA's regulation⁷⁰, electricity suppliers offering electricity contracts to electricity consumers are obliged to report the most common contract types to the elpriskollen.se price comparison site. Elpriskollen is run by Ei and allows comparisons to be made between different electricity trading companies and their current offers. There are over 140 electricity suppliers on Elpriskollen. However, the total number of electricity suppliers does not provide the whole picture of how many companies the individual customer can actually choose between, since some electricity suppliers do not offer electricity contracts in all bidding areas, and some small local electricity suppliers choose to operate only in the local network.

At the close of the year, the three largest electricity suppliers had a collective market share of 45 per cent, counted in number of customers⁷¹, which is the same as in 2019.

Stable customer activity

In total, 10.8 per cent⁷² of customers switched between electricity suppliers in 2020, approximately the same as 2018 and 2019.

The number of renegotiated contracts has remained relatively unchanged over the past decade. A total of 23.3 per cent⁷³ of all household customers resubscribed to their electricity supply contracts in 2020. Another trend that has been evident for several years now is that most contracts are renegotiated during the autumn and winter months.

However, switches and renegotiated electricity contracts do not provide a complete overview of the extent of customer activity in a market. Customers can be active by choosing not to switch their electricity contracts as they consider that they have a good electricity supplier, a good price, or good contract terms and conditions. Customers may also be of the opinion that the cost of their electricity

⁷⁰ EIFS 2020:04

⁷¹ Source: Energy Market 2020, with part of the calculation on data for 2019

⁷² Part of the calculation based on data for 2019

⁷³ Source: Statistics Sweden

accounts for such a small proportion of their overall household expenses that reducing the cost of their electricity is not important.

The price of electricity to customers is affected most by the price in the wholesale market

The single biggest element of the price of electricity, accounting for 85–90 per cent⁷⁴, is made up of the cost incurred by electricity trading companies to buy the electricity required to cover the consumption by customers. Electricity is purchased on Nord Pool or via bilateral agreements with producers. Variable price contracts are based on a spot price adjusted for customer power takeoff profiles, while fixed-price contracts are based on the cost incurred by electricity suppliers to buy electricity on futures adjusted for customer power takeoff profiles. In the case of fixed-price contracts, there is also a cost for regional hedging with EPAD contracts.⁷⁵ In addition to the purchase price of electricity, there are costs for electricity certificates, origin marking, administration, and VAT, among other things.

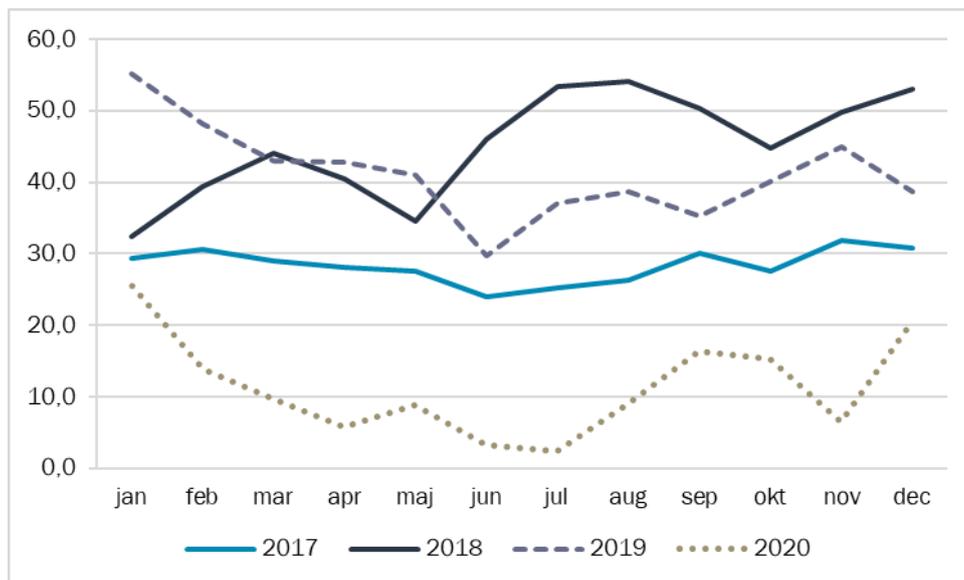
Link between spot prices and prices to end-customers

Spot prices in 2020 were very low for large parts of the year, with a slight increase towards the end of the year. During the second half of the year, price variations between Sweden's bidding areas were relatively large. The average price was significantly lower than in 2019 on the northern European Nord Pool electricity exchange. The average system price in 2020 was SEK 0.114 per kWh, which can be compared with the 2019 average of SEK 0.412 per kWh and SEK 0.452 per kWh in 2018: see Figure 12.

⁷⁴ Source: Ei report "Utvärdering av effekterna av elområdesreformen" [Evaluation of the effects of the electricity region reform], Ei R2014:08

⁷⁵ The system price (that is, the price that would be charged if there were no transmission restrictions in the region) is used as a reference price for futures contracts that electricity suppliers use for hedging when they sell fixed-price contracts to their customers. However, the physical in-feed from the production source and the actual consumption of electricity are priced in the local electricity regions. Since the prices in the electricity regions may vary from the system price, there is a need for stakeholders to hedge against this regional price risk. They do this by trading EPAD contracts.

Figure 12. System price Nord Pool, öre/kWh



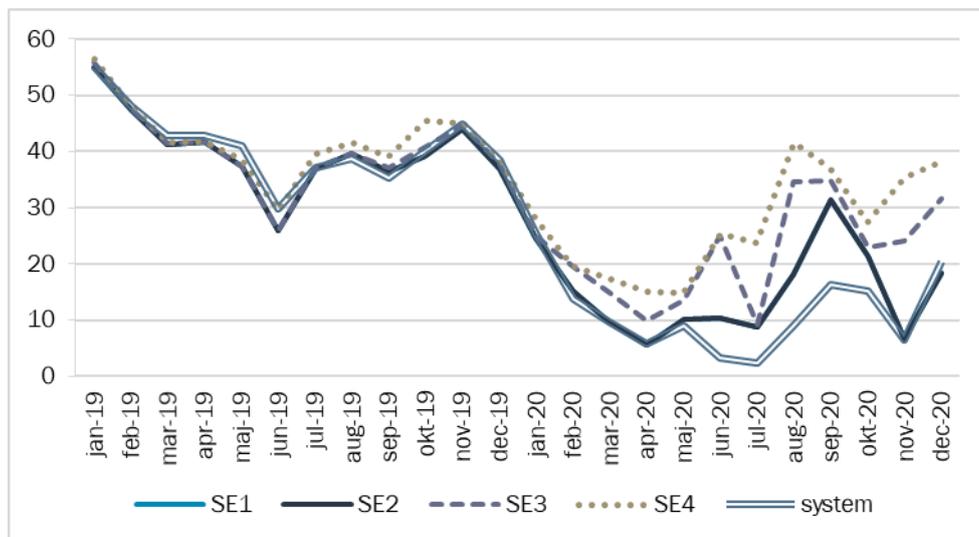
Source: Nord Pool

The price differences between bidding areas

The price differences between different bidding areas were greater during most months of the year than in previous years. On average, bidding area SE4 and bidding area SE1 had a difference of SEK 0.119 per kWh in 2020, which can be compared with 2019, when the difference on average was SEK 0.02 per kWh. The difference between bidding areas SE4 and SE3 was, on average, SEK 0.048 per kWh in 2020, which can be compared with SEK 0.015 per kWh on average during 2019.

November was the month with the largest price difference between bidding areas, when bidding area SE4 had a spot price on average SEK 0.287 higher than in bidding area SE1, see Figure 13. The smallest difference was in January when there was a difference of SEK 0.033 in price between bidding area SE4 and SE1.

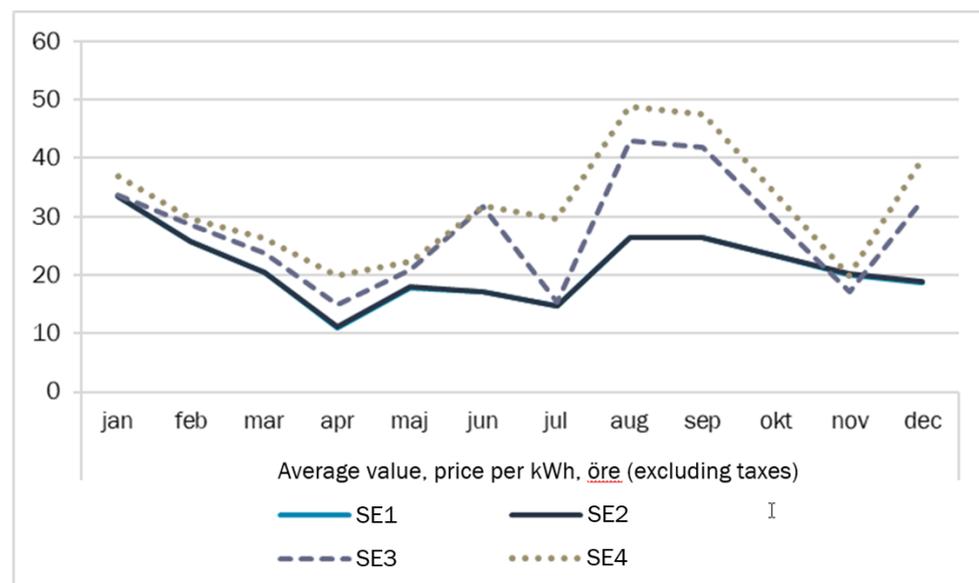
Figure 13. Spot price per bidding area plus system price 2019–2020, SEK/kWh



Source: Nord Pool

Figure 14 indicates that prices to end-customers in the various electricity regions follow the spot prices in each electricity region. The price differences in the prices to end customers with variable price contracts between the four bidding areas were slightly larger in 2020 than in 2019. However, the prices in bidding areas SE1 and SE2 were almost the same, which makes it very difficult to distinguish between them in the graph.

Figure 14. Electricity trade price for variable price contracts for a typical customer (20,000 kWh per year), öre/kWh



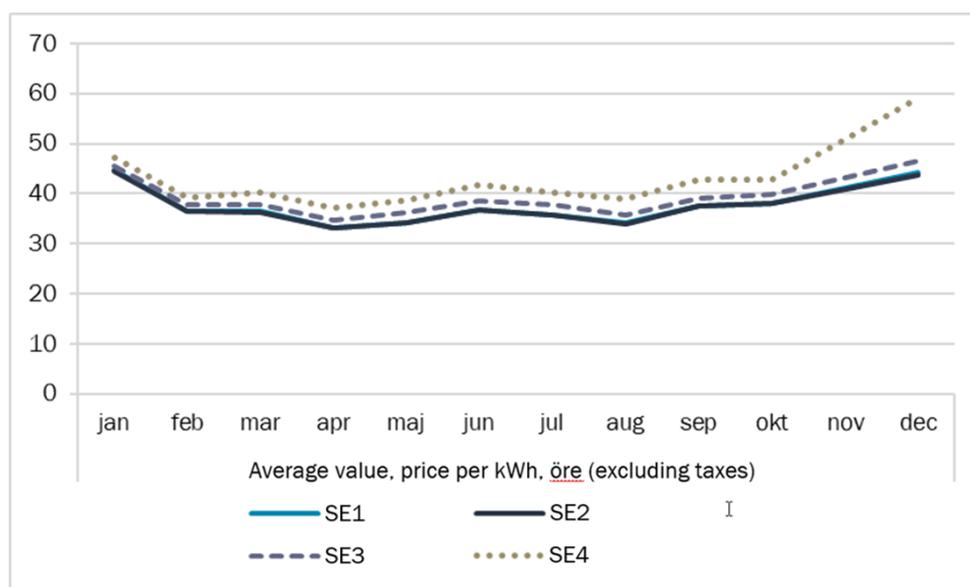
Source: Statistics Sweden

There is a slight difference between bidding areas with regard to fixed prices with a tie-in period of one year. On average, prices for contract type "fixed price 1 year" were around SEK 0.056 higher in bidding area SE4 than in bidding areas SE1 and

SE2 in 2020. The difference between bidding area SE3 and bidding area SE1 was approximately SEK 0.017 in 2020, see Figure 15. The fixed prices are what customers were offered for entering into contracts for that month, while the variable price is what the variable price customers paid.

The reasons for these price differences are evident from the need for hedging by the electricity suppliers. There is a greater need for hedging in electricity regions where prices change a lot, resulting in increased costs for electricity suppliers, and thereby a higher price for the electricity that they can offer to end-customers. There are also some electricity suppliers who are only active in northern or southern Sweden, and their surcharges and costs can vary, which has an impact on the price of electricity.

Figure 15. Electricity trade price for fixed price 1 year for a typical customer, 20,000 kWh per year, öre/kWh



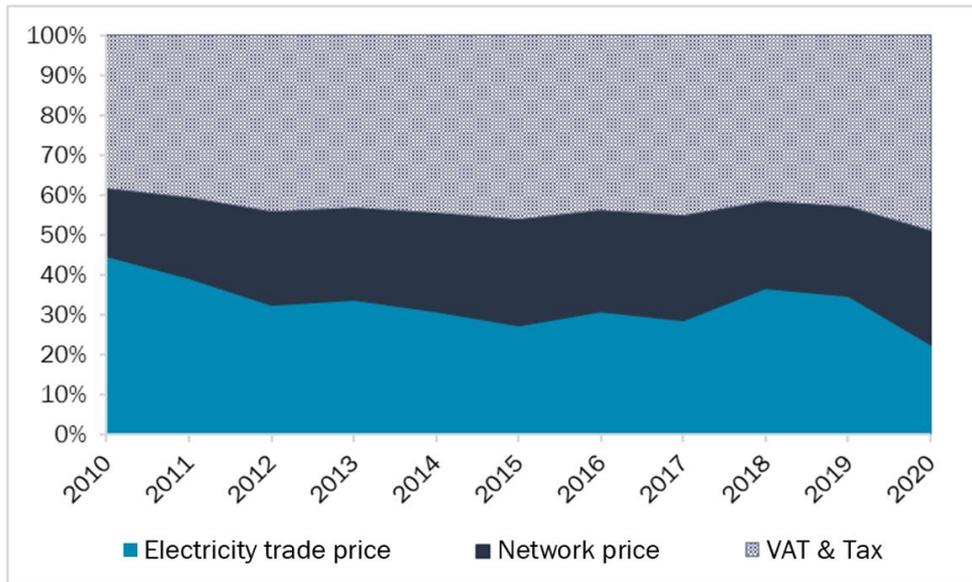
Source: Statistics Sweden

Tax and VAT make up most of the total cost of electricity

The distribution between the various elements in the total cost of electricity that is paid by a house heated by electricity has varied over the past few years.

Explanations for this are that the network charges and electricity trade price levels have changed over time, while energy tax has been increased, see Figure 16.

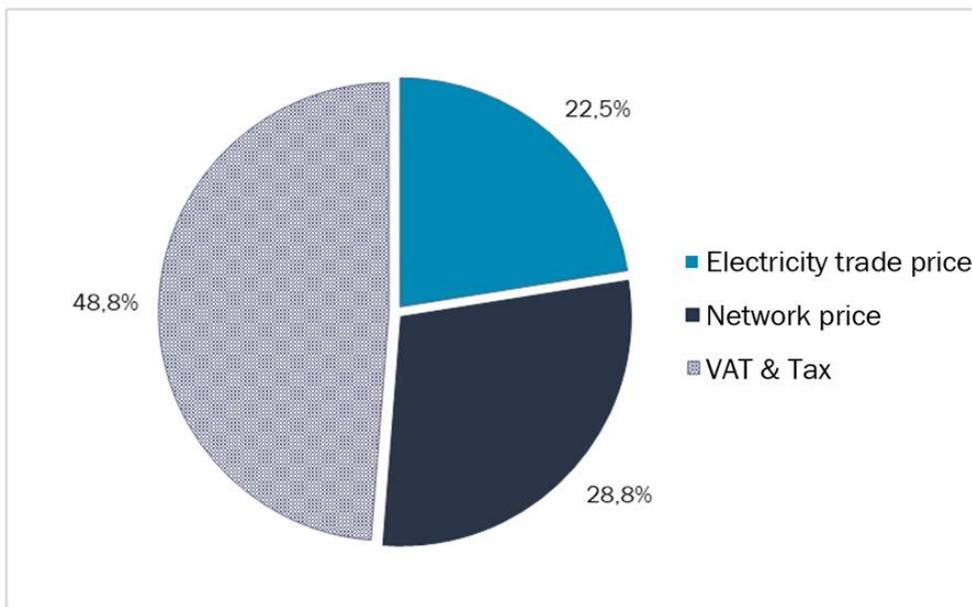
Figure 16. Distribution of the cost of electricity for an electricity consumer using 20,000 kWh per year. Actual cost.



Source: Ei, Statistics Sweden

In 2020, the largest part of the cost of electricity – 48.8 per cent – was made up of tax and VAT. The cost for electricity trading amounted to 22.5 per cent of the total cost of electricity to the electricity consumer, while the cost for network transmission amounted to 28.8 per cent, see Figure 17. The fact that the electricity trade price was historically low during 2020 meant that it accounted for a smaller proportion of the total cost of electricity.

Figure 17. Components of the electricity cost in 2020 for an electricity consumer using 20,000 kWh per year. Actual prices.



Source: Ei, Statistics Sweden (rounding-off means that the percentage is 100.1).

Total electricity cost for a consumer

The total electricity cost for 2020 for an apartment customer with an annual consumption of 2,000 kWh per year and with a variable price contract totalled approximately SEK 3,900, see Table 4. For a house customer using 20,000 kWh per year and with a variable price contract, the cost of electricity in 2020 amounted to approximately SEK 24,500: see Table 5.

Table 4. Total annual cost 2020, variable price, apartment customer in bidding area SE3

2020 annual cost at variable price, apartment customer 2,000 kWh	SEK
Electricity trading	822
VAT	205
Electricity trading, Incl. VAT	1 027
Electricity network	1 615
Tax	706
VAT	580
Total	3 929

Source: Ei, Statistics Sweden

Table 5. Total annual cost 2020, variable price, house customer in electricity region SE3

2018 annual cost at variable price, house customer 20,000 kWh	SEK
Electricity trading	5 514
VAT	1 378
Electricity trading, Incl. VAT	6 892
Electricity network	7 062
Tax	7 060
VAT	3 531
Total	24 545

Source: Ei, Statistics Sweden

The total annual cost for a customer with a fixed-price, 1-year contract varies depending on when the customer took out the contract. For an apartment customer using 2,000 kWh per year, the total annual cost in 2020 averaged between SEK 4,004 and SEK 4,306.50, depending on the month of the year in which the customer took out the contract: see Table 6. For a house customer using 20,000 kWh per year, the total annual cost amounted to between SEK 26,328 and SEK 29,278 kronor in 2020 instead: see Table 7.

Table 6. Total annual cost 2020, fixed price 1-year, apartment customer in bidding area SE3

Total electricity cost at fixed price 1-year, apartment customer 2,000 kWh	SEK
Electricity trading	940-1 182
VAT	235-295.5
Electricity trading, Incl. VAT	1 175-1 477.5
Electricity network	1 651
Tax	706
VAT	580
Total	4 004-4 775

Source: Ei, Statistics Sweden

Table 7. Total annual cost 2020, fixed price 1-year, house customer in bidding area SE3

Total electricity cost at fixed price 1-year, house customer 20,000 kWh	SEK
Electricity trading	6 940-9 300
VAT	1 735-2 325
Electricity trading, Incl. VAT	8 675-11 625
Electricity network	7 062
Tax	7 060
VAT	3 531
Total	26 328-29 278

Source: Ei, Statistics Sweden

Price difference between electricity suppliers

Ei has found that an apartment customer in bidding area SE3 can save SEK 375 per year, and a house customer with the house heated by electricity in the same bidding area can save SEK 1,400 per year by switching from an average priced variable contract to one of the market's five cheapest variable price contracts.⁷⁶

The price per consumed kWh for an apartment customer is often slightly higher than for a house customer, this is partly due to the fact that some electricity suppliers have the same fixed annual charge for all customer types, which means that the fixed cost has a very large impact on the comparable price for an apartment customer who consumes a small amount of electricity, and the price at these electricity suppliers will be high⁷⁷. This also shows that the network charges make up a larger proportion of the total cost of electricity for an apartment customer than for a customer with a house. Despite the price per kWh often being higher, the total electricity bill will of course be significantly lower for an apartment customer than for a house customer since the consumption is much lower.

⁷⁶ Price calculations from Elpriskollen, autumn 2019 - autumn 2020.

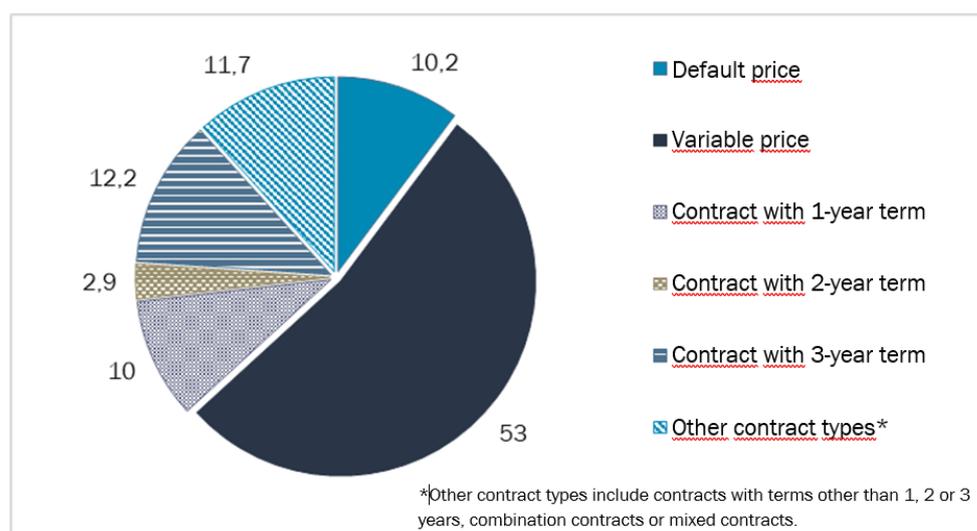
⁷⁷ In the majority of cases, the fixed cost is made up of a fixed annual charge in SEK. When calculating the comparable price, the fixed annual charge is spread over the number of kilowatt hours per year.

The opportunities for savings may vary depending on when a contract is taken out during the year, which contract type is most favourable at the time, and how the prices in the contract types develop.

More customers with variable price contracts

A trend that has continued for a number of years is that more customers are choosing variable contract types. 53 per cent of Swedish household customers had taken out variable price contracts by December 2020, representing an increase of 2 percentage points compared with December 2019. Over a quarter of customers had a fixed price contract with a tie-in period of one, two or three years, see Figure 18.

Figure 18. Distribution of household customers by contract type, December 2020, per cent



Source: Statistics Sweden

Customers with designated contracts

Customers in the Swedish electricity market have the option of choosing the electricity supplier they prefer. This means that stakeholders are operating in a free market in competition against other companies, with free pricing. If the customer does not make an active choice, the network operator is obliged to designate an electricity supplier. The price of designated contracts in 2020 was approximately 80 per cent higher than for variable price contracts, this is because the variable prices were sometimes at very low levels. There may be various explanations as to why customers remain with designated contracts despite the high prices. Customers may be unaware that they have a contract type that is more expensive than other contract types, and that they can easily switch to another, cheaper contract. During various regulatory initiatives, Ei has noted that information to the designated contract customers is lacking. Customers may also consider the cost of electricity to be such a small element of their overall household finances that they are not bothered about switching. A few designated electricity suppliers use variable contracts instead of so-called designated contracts for customers who do not make

active choices. In these cases, inactive customers at least get prices that are more advantageous than in the designated contracts.

The proportion of customers with designated contracts has decreased by 0.4 percentage points since December 2019, when it stood at 10.6 percentage points.

Work to strengthen customers in the Nordic region

Ei has played an active part in operations throughout the year, among other things, chairing meetings of the NordREG end-customer market group⁷⁸. The work of the end-customer market group aims to strengthen the position of customers in the Nordic end-customer markets for electricity.

In 2020, the group initiated a study on the costs and benefits of interoperability between Nordic data hubs (when available in all countries).

In November, the group held the NordREG Retail Market Monitoring Workshop for the third time in order to exchange knowledge and experience in the regulatory area, and to identify areas for collaboration and information exchange, as well as the need for further development of regulatory frameworks. The theme of this workshop included regulation of comparison tools and unfair commercial practices when selling electricity. The results will also form the basis of proposals for the focus of the group's work in 2021.

Ei's involvement in the work towards well-functioning end-customer markets in Europe

Ei is a member of CEER (Council of European Energy Regulators), which is an organisation of independent national regulatory authorities within the European Union and EEA (European Economic Area). Ei participates in the Customer and Retail Markets Working Group (CRM WG) for issues concerning end-customer markets. In collaboration with the European consumer organisation BEUC the group has, among other things, developed a common vision for the transition to a sustainable and climate-neutral energy system by 2030.

During the year, CEER has agreed on common positions for how it wants the European electricity and gas markets to develop in the coming years and has published several reports.

Ei has actively participated in the work on the annual report on customer protection published by CEER in conjunction with ACER. Ei also leads the Retail Market Roadmap Work Stream (RMR WS), which has developed a roadmap towards well-functioning end-customer markets for electricity and gas in all member countries by 2025. The work is based on a handbook published by CEER in 2017, which describes how each regulatory authority can use 25 measurable

⁷⁸ Retail Market Working Group

criteria to determine for itself how well its own end-customer market is working. In 2020, RMR WS drew up a report providing examples of the work by individual countries based on the handbook to make their markets work better. The name of the report is *CEER Roadmap to 2025 Well-Functioning Retail Energy Markets 2019 Self-Assessment Status Report*.

Development project with elpriskollen.se

Ei runs elpriskollen.se, Sweden's only independent price comparison site for electricity contracts. During the year, Ei focused on checking that reported price information and contract terms were correct.

In May 2020, Ei introduced an hourly rate contract on elpriskollen.se. The new electricity market directive⁷⁹ that came into force in 2019 set additional requirements on price comparison sites, and Ei also worked on incorporating the requirements on elpriskollen.se during 2020. These requirements included the facility for economic operators with an annual electricity consumption of up to 100,000 kWh to also be able to compare electricity contracts in comparison tools, and that more contract types should be included. In order to ensure and clarify that electricity suppliers must report the new contract types, a new regulation was drawn up on the obligations of electricity suppliers when reporting electricity contracts⁸⁰.

Electricity supplier centric model and electricity market hub

In 2015, Ei and Swedish system operator Svenska kraftnät were commissioned by the government to continue working on the issue of introducing a central information management model, known as a hub. As part of this assignment, Ei has worked in close cooperation with Svenska kraftnät, which in turn has been commissioned by the government to develop and run the electricity market hub. Ei's assignment involved carrying on work on previous proposals for the introduction of a model centring on electricity suppliers. In June 2017, Ei reported on the assignment to the government in the form of its report *Ny modell för elmarknaden* [New model for the electricity market] (Ei R2017:05). This report presents proposals for legislative amendments in order to introduce a new market model where an electricity market hub constitutes a hub for information exchange between electricity market stakeholders. The proposal has not yet been implemented.

⁷⁹ Directive (EU) 2019/944 on common rules for the internal market for electricity and amending Directive 2012/27/EU

⁸⁰ EIFS 2020:04

1.4 Investigations and measures to promote competition

A number of authorities and organisations are cooperating in the monitoring of the Swedish and Nordic electricity market with a view to using various measures to create an effective electricity market and to prevent the exercising of market power.

1.4.1 Responsibilities relating to the monitoring of the electricity market

Ei is the national energy regulatory authority in Sweden. Besides its role as regulatory authority, Ei constantly monitors and analyses development on the electricity and gas markets and submits proposals for amendments to regulatory frameworks or other actions in order to promote the function of the markets.

Trading and company activities in the trading platforms operated by Nord Pool, EEX and Nasdaq Commodities are subject to monitoring by Ei, among others. Ei monitors that the stakeholders authorised to act as nominated electricity market operator in the Swedish electricity regions are complying with the rules that apply to nominated electricity market operators. The Nord Pool trading platform, which is based in Norway, is monitored by the Norwegian Water Resources and Energy Directorate (NVE) and the Financial Supervisory Authority of Norway.

The Financial Supervisory Authority supervises the Swedish stakeholders operating on the financial electricity market with the permission of the authority. The Swedish Competition Authority monitors companies on the Swedish electricity market to ensure that they do not breach bans on anti-competitive cooperation and misuse of dominant position in accordance with the Treaty on the Functioning of the European Union (the EUF Treaty) and the Competition Act⁸¹. The Competition Act also bans anti-competitive public sales activities. The Swedish Competition Authority can actively intervene to prevent the above restrictions of competition on its own initiative or after receiving reports from companies and the general public. The Competition Act also includes rules on control of concentrations between undertakings. The Swedish Competition Authority also provides proposals for rule changes and other measures to eliminate existing barriers to competition.

Monitoring of the Swedish markets in accordance with REMIT

The Regulation on Wholesale Energy Market Integrity and Transparency (REMIT⁸²) came into force in 2011, facilitating coherent monitoring of the increasingly integrated European electricity and gas markets. Ei's responsibility

⁸¹ Competition Act (2008:579)

⁸² This abbreviation has been devised from the name of the regulation. In Swedish, the regulation is called "Europaparlamentets och Rådets förordning (EU) nr 1227/2011 av den 25 oktober 2011 om integritet och öppenhet på grossistmarknaderna för energi".

and ongoing efforts to monitor the Swedish markets have increased as a consequence of this. Ei has procedures that are applied every day to its market surveillance work.

All trading in wholesale energy products, both via electricity exchange and bilaterally, must be reported by the market stakeholders to ACER. Ei has entered into agreement with ACER to have access to the trading data for the stakeholders. Exactly how the trading should be reported and by what means is regulated in the implementing acts⁸³.

Ei charges a fee to registered market stakeholders in order to finance its monitoring of trading in wholesale energy products.

Marketplace regulatory frameworks and market surveillance

All stakeholders in Nord Pool, EPEX Spot and Nasdaq Commodities must comply with special regulatory frameworks for trading on their respective trading platforms. These regulations relate in particular to the handling of information that affects prices. Nord Pool, EPEX Spot and Nasdaq Commodities have internal market surveillance functions where trade is monitored constantly.⁸⁴ The functions for market monitoring and surveillance at Nord Pool, EPEX Spot, and Nasdaq Commodities also contribute to Ei's work, since any violations of the regulations must be reported to Ei.

Measures to reduce risks of joint ownership in nuclear power

In various contexts, the Swedish Competition Authority has drawn attention to the general risks for unauthorised cooperation through common ownership of electricity production resources. In 2011, and with the support of Ei, the owners of nuclear power plants adopted a common industry code of ethical conduct for the exchange of information between the companies. Independent observers are members of the boards at the nuclear power companies, specifically for the purposes of monitoring the industry code of ethical conduct. Ei's task is to nominate one observer per board of directors. Every year, Ei publishes a monitoring report from each board of directors, including any comments from the observer.⁸⁵

⁸³ Commission Implementing Regulation (EU) No 1348/2014 of 17 December 2014 on data reporting implementing Article 8(2) and Article 8(6) of Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency

⁸⁴ This must be done in accordance with Article 15 of Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency

⁸⁵<https://www.ei.se/sv/Publikationer/arsrapporter-karnkraftforetag/>

1.5 Security of supply, electricity

Security of supply in the Swedish electricity system is generally good. Manual disconnection of certain electricity consumers, which is the method to be used by Svenska kraftnät according to the Electricity Act when there is no other way of achieving balance between in-feed and takeoff in the electricity system, has never needed to be applied.

1.5.1 Monitoring of electricity production capacity

Greatest contribution of renewable power

In Sweden, investments in new electricity production capacity are taking place on essentially market-based grounds. Permits from Ei are not required for the construction of new electricity production plants in Sweden. That said, permits are required in accordance with both the Environmental Code⁸⁶ and the Planning and Building Act⁸⁷.

Renewable power such as hydropower, wind power and solar energy currently makes up more than 75 per cent of the total installed output power. These types of power also made the greatest contribution to the installed output power from previous years. Table 8 shows the installed output power, by production type.

Table 8. Installed output power at Sweden's power stations 2013–2020, MW

Types of power	2013	2014	2015	2016	2017	2018	2019	2020
Nuclear power	9 531	9 528	9 714	9 076	8 586	8 614	7 725	6 871
Hydropower	16 150	16 155	16 184	16 181	16 301	16 315	16 328	16 334
Wind power	4 470	5 420	6 029	6 495	6 691	7 406	8 980	10 017
Solar power	43	79	126	185	254	435	690	1 090

Source: Swedenergy

1.5.2 Monitoring of investments in electricity production capacity with regard to security of supply

Plans for extensive reinforcement of the Swedish transmission network

The Swedish transmission network is undergoing a period of extensive expansion. The network is being reinforced in order to facilitate new electricity production, extend market integration with the surrounding world, and assist in the creation of a joint European electricity market. At the same time, there is a significant need for new investment and reinvestment.

⁸⁶ Environmental Code (1998:808)

⁸⁷ Planning and Building Act (2010:900)

One of the larger projects ongoing with a view to increasing capacity and reliability in the Nordic power system is the South-West Link. The purpose of this cable is to reduce the transmission restrictions from the Mälardalen region to southern Sweden. The South-West Link is being constructed in two parts, with a hub at Jönköping. From the hub, there will be a link heading south to Skåne, while the other will head north to Hallsberg. The entire South-West Link is expected to be fully operational during autumn 2021, and at that time it is estimated to increase the electricity transmission capacity between central and southern Sweden by up to 25 per cent.

Besides the South-West Link, a number of projects are in progress to reinforce the electricity networks in the metropolitan regions and transmission capacity between the Swedish electricity regions. One such project is Svenska kraftnät's planned cable between Skogssäter (Trollhättan) and Stenkullen (Lerum), which will help to secure the electricity supply in Västra Götaland. Another is the Stockholm Ström [Stockholm Power] project, which aims to reinforce and renew the electricity network in the Stockholm region in order to meet future needs for secure electricity supplies. Svenska kraftnät has been working together with regional and local network owners Vattenfall and Ellevio to propose an entirely new structure for the region's electricity networks, and this is now being implemented in around fifty projects.

1.5.3 Measures for handling demand peaks or supply deficits

Svenska kraftnät is responsible for ensuring that a strategic reserve (the so-called power reserve) is available throughout the winter, between 15 November and 15 March.⁸⁸ Svenska kraftnät procures the reserve by entering into agreements with electricity producers and electricity consumers so that they set production capacity or consumption reduction according to Svenska kraftnät's requirements. Both procurement procedures require the resource/plant to be available in electricity region SE3 or SE4. The power reserve price is set to the ceiling price on Nord Pool, EUR 3,000 per MWh, when the power reserve production element is activated on Nord Pool.

By law, the power reserve is applicable until 15 March 2025. The law has been extended, last in 2016⁸⁹. Currently, only Fingrid in Finland and Svenska kraftnät in Sweden procure power reserves prior to cold winters in the Nordic Region. The handling of power reserves is based on the guidelines devised jointly by the Nordic transmission network companies that act as system operators.⁹⁰

⁸⁸ According to the Act (2003:436) on power reserve

⁸⁹ SFS (2016:422)

⁹⁰ "[Guidelines for implementation of transitional peak load arrangements](#)"

Due to new rules in the EU Electricity Market Decree that came into force in 2019 and at the beginning of 2020, the regulatory framework may need to be adapted.

2 The natural gas market



Natural gas was introduced to Sweden in 1985 by expansion of the Danish natural gas system to southern Sweden via a pipeline from Dragør, near Copenhagen, to Klagshamn, just outside Malmö.

On 1 July 2007, trade in natural gas was opened up to competition in the Swedish system. The network operation is a regulated monopoly.

2.1 The gas network

Natural gas was not introduced in Sweden until 1985. The western Swedish natural gas system comprises around 600 kilometres of transmission pipeline and around 3000 kilometres of distribution pipeline. The natural gas network is divided into four different operations: transmission, distribution, gasification and storage. The gas is transported long distances under high pressure in transmission pipelines. Pressure reduction is then carried out in metering and regulating stations before the local distribution network transports the gas to consumers.

The western Swedish natural gas system is small compared with most other natural gas networks in Europe. The network extends from Trelleborg in the south to Stenungsund in the north, and a short distance east towards Jönköping, see Figure 19. Just over 30 of the 290 municipalities in Sweden have access to natural gas. Gas is brought into Sweden via a pipeline from Dragør in Denmark.

The western Swedish natural gas network comprises a number of different network types. The largest pipelines that transport the gas under high pressure are the transmission pipelines. These pipelines have enough capacity to transmit very large quantities of gas. In Sweden, the transmission network is owned and operated by Swedegas, which is also responsible for system balance. A small number of very large consumers are connected directly to the transmission network.

There is also an urban and vehicle gas network in the Stockholm region that is owned by Gasnätet Stockholm AB, which is responsible for development, operation and maintenance of the network. The urban and vehicle gas network each comprise around 500 kilometres and 40 kilometres of pipeline respectively. The urban gas network covers large parts of the city of Stockholm, along with Solna and Sundbyberg. The production and in-feed of gas to the urban gas network primarily takes place from a gasification facility in Stockholm to which both biogas and LNG, liquefied natural gas, are supplied. At this facility, LNG is vaporised to make natural gas, which is then mixed with air to turn it into the urban gas suitable for the customer appliances used in the urban gas network. This gas is distributed via pipelines that are pressurised at special regulating stations all over the city. The vehicle gas network, 40 kilometres long, links biogas suppliers' production plants for gas in Stockholm with bus depots for fuelling buses and fuelling stations for vehicle gas.

There are also a number of small local gas networks around Sweden. Many of the small local networks are primarily used for transporting vehicle gas-type biogas from production plants to fuelling stations.

One thing the gas network in Stockholm and the small local gas networks all over Sweden have in common is the fact that they are not connected to a transmission

network. The western Swedish gas network and the gas network in Stockholm are the networks covered by the provisions of the Natural Gas Act.⁹¹ According to the Natural Gas Act, natural gas also includes biogas insofar as it is technically possible to use this gas in a natural gas system.

Figure 19. Transmission pipelines in the western Swedish natural gas network



Source: Ei

2.1.1 Biogas in the natural gas network

The natural gas and biogas markets in Sweden are integrated to an extent as the natural gas network can also be used to distribute biogas. Biogas that is upgraded to natural gas quality can be introduced to the natural gas network in most cases, with no technical impact on natural gas users. If problems occur, these are generally due to the fact that the chemical composition is not the same as that of traditional natural gas. There are currently nine biogas producers connected to the western Swedish natural gas system, two of which are connected in order to feed gas into the transmission network. Another two biogas producers are connected to the Gasnätet Stockholm AB network.

New tax rules for joint distribution were introduced in 2011 in order to facilitate joint distribution of natural gas and biogas in a single network. Essentially, these new rules meant that the contractual supply was separated from the physical supply. According to a previous regulatory framework, all customers on one and the same network received the same amount of biogas regardless of the contract

⁹¹ Natural Gas Act (2005:403)

that formed a basis for the supply. The altered regulations mean that a biogas producer can conclude a supply contract with a consumer for 100 per cent biogas, even if the consumer receives a mixture of biogas and natural gas in practice. This concept resembles the electricity market's system of origin marking, where electricity consumers can purchase electricity produced by wind power no matter what their location on the network.

2.1.2 Functional unbundling of natural gas companies

What is known as functional unbundling between companies is required with a view to preventing cross-subsidisation between companies running different types of natural gas operation. This means that companies that perform natural gas transmission, gasification or storage operations must not trade in it. The rules on unbundling mean that companies that previously traded in natural gas and also transmitted it, for instance, had to be divided into two separate elements. The board members, CEO or company signatories of any company that is in possession of pipelines in a Swedish natural gas system must not simultaneously hold any of these roles in a company that trades in natural gas. However, Swedish legislation does not state that gas utility companies are not allowed to form part of a group that produces or trades in natural gas.

All companies running natural gas transmission operations and that form part of the same group as a company that produces or trades in natural gas must compile a monitoring plan ⁹²in accordance with the Natural Gas Act. The purpose of the monitoring plan is to ensure that companies operate objectively and do not unduly favour any market stakeholder. The monitoring plan must specify what measures are to be implemented by the company to counteract discriminatory behaviour in respect of other market stakeholders. They must also publish an annual report describing the measures they have implemented.

Certification of system operators

According to the Internal Market in Gas Directive⁹³ and national rules, the transmission system operators⁹⁴ must be certified. In July 2012, Ei certified Swedegas AB as transmission system operator. This certification will remain valid until further notice, but the decision may be reviewed by Ei if the system operator fails to meet the requirements for certification.

Swedegas was owned by venture capital company EQT between 2010 and 2015. A change of ownership was announced in 2015, when Enágas from Spain and Fluxys

⁹² Natural Gas Act 2005:403 Chap. 3 section 9

⁹³ Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas Article 10.

⁹⁴ The term system operator for transmission systems is synonymous with transmission network operator and transmission network company.

from Belgium joined the company as its new owners. On 21 November 2018, Swedegas announced that the European Diversified Infrastructure Fund (EDIF II), which is managed by First State Investment, were the new owners.⁹⁵

2.1.3 Technical function of the natural gas network

Balancing natural gas

In its capacity as a transmission network operator, Swedegas owns the western Swedish natural gas network and is responsible for its operation and maintenance. This role is comparable to the role played by Svenska kraftnät in the electricity market, as Swedegas both owns the supply network and is responsible for short-term balancing of the in-feed and out-feed of gas. On 1 June 2013, the government appointed Swedegas as the system balance administrator for the western Swedish natural gas network, a role previously held by Svenska kraftnät.

To guarantee balancing, Swedegas concludes balance contracts with gas market stakeholders known as balance administrators. These balance administrators take on financial responsibility for ensuring that end-user consumption is matched by the supply. The western Swedish natural gas network offers major opportunities for storage of gas in the pipelines, known as linepack, thereby facilitating balancing. Short-term imbalances may constitute as much as 25 per cent of consumption on a winter's day without jeopardising the technical function of the network.

The system balance administrator must not conclude balance administration contracts with individual balance administrators until the contract terms have been approved by Ei.

At the end of 2018, Swedegas submitted a new balance administration contract for gas for approval by Ei. The contract, which was approved during spring 2019, means that a common balance market for natural gas networks is being created in Western Sweden and Denmark. The decision allows conditions to be created so that Sweden is also able to fully implement the EU Regulation on Gas Balancing of Transmission Networks (Regulation (EU) 2014/312) in time. This regulation had to be implemented in all Member States by 16 April 2019. The balancing markets for Sweden and Denmark have been integrated since 1 April 2019. The purpose of the common balancing zone is to increase the efficiency of cross-border trade between the Swedish and Danish markets, as well as to harmonise balancing procedures.

⁹⁵ Swedegas, together with its sister company Weum, has been part of Nordion Energi, which is owned by EDIF II, since January 2020.

Quality control of the natural gas network

The gas utilities are responsible for ensuring that operation and maintenance of their plants shall be safe, reliable and efficient so that they meet reasonable requirements in terms of the transmission, storage and gasification of gas in the long term.

The western Swedish natural gas network is primarily made up of steel pipelines. The function of the system is checked regularly, and defective or end-of-life equipment is replaced. According to stakeholders, these pipelines are deemed to have an anticipated service life of at least 40 years, while some equipment for monitoring, control and regulation is expected to have a service life of 5–20 years.

The pipes in the transmission network are approved for a pressure of 80 bar, and Swedegas has selected a minimum operating pressure of 45 bar. The transmission pipelines transmit the natural gas to the distribution networks. These are connected to the transmission network by a metering and regulating station. The gas flow is measured at the metering and regulating station, and its pressure is reduced. The distribution networks transport the gas from the transmission network out to smaller industries for the most part, and to regulating stations where the pressure is reduced still further before the gas is distributed to end-customers, such as customers using stoves, or gas boilers for heating purposes.

Most of the distribution pipelines are made of polyethylene. Steel pipelines are used in some cases when gas is transmitted to customers who need a gas pressure higher than 4 bar. Guidelines for distribution network implementation, operation, repair, maintenance, etc. for a maximum pressure of 4 bar are coordinated in the energy gas standards devised by the trade organisation Energigas Sverige.

The network owner collects measurements from boundary points, out-take points and in-feed points. These measurements are then reported on to the gas supplier, balance administrator and system balance administrator. The measurements form a basis for settlement of in-feed and out-take energy quantities.

Gas charges are based on energy supplied. To calculate the energy quantity, the volume of the gas in m³ is multiplied by the energy content of the gas per volume unit in kWh/m³. The energy content per volume unit is generally known as the calorific value, and in the Swedish system a calorific value is used for the entire system. The calorific value can be stated as either an upper or lower calorific value, depending on whether or not the products of combustion – the flue gases in the case of natural gas – have been cooled to the same temperature as the gas before combustion began. So in other words, the energy content of the gas per volume unit is higher for a plant that has equipment that can make use of the energy in the flue gases.

Connection to a natural gas pipeline

The owner of a natural gas pipeline is obliged, on reasonable terms, to connect it to natural gas pipelines, storage facilities and gasification facilities owned by others. However, this obligation does not apply if the pipeline does not have sufficient capacity. When a request for connection is submitted, the owner of the natural gas pipeline must submit written information on the charge and other terms and conditions for the connection within a reasonable time.

Connection to a storage facility and gasification facility

The owner of a facility or pipeline for storage of natural gas, or of a gasification facility connected to the Swedish natural gas system is obliged to accept, on reasonable terms, natural gas owned by another party for storage or gasification. This obligation does not apply if the facility does not have sufficient capacity. When a request for in-feed is submitted, the owner of the storage facility or gasification facility must submit written information on the charge and other terms for the in-feed within a reasonable time.

Examination of terms for connection to a natural gas facility

The methods for formulating of contracts for connection to various types of natural gas facility are approved by Ei before being put into use. The terms specified in the connection contracts must also be approved before being put into use by the owners of natural gas facilities.

2.1.4 Network charges for connection and transmission

Review of gas network charges

Ei inspects the gas utilities and approves the revenue framework for the utilities. Supervision of the utilities' tariffs includes the companies that are connected to the Swedish natural gas system according to the terms of the Natural Gas Act. Until 2015, this review took place retrospectively, but since January 2015 utilities' revenues have been regulated in a similar way to the rules defined for the electricity market. This means that revenues are regulated in advance in a revenue framework extending over a four-year period. This framework defines an upper limit for the total revenues that companies are allowed to receive from their natural gas activities.

When devising charges for the transmission of natural gas, companies must in particular observe the number of connected customers, customers' geographical locations, the amount of transmitted energy, subscription costs for overhead lines, reliability of supply, and pipeline pressure. As a consequence of the Internal Market in Gas Directive⁹⁶, an amendment came into force in 2012 which means that

⁹⁶ Article 41.6 a.

Ei's supervision in accordance with the Natural Gas Act is also applicable to tariffs for access to gasification facilities. Access tariffs must not be applied until Ei has approved the methods used to devise the tariff.

Ei's supervision of the methods that form a basis for the devising of tariffs aims to ensure that they are objective and non-discriminatory in accordance with the requirements of the Natural Gas Act. An appeal against Ei's decision must be submitted within three weeks by the party to which the decision relates. The case is examined by a general administrative court.

Prior to the regulatory period in 2015–2018, these companies submitted applications in June 2014 for revenue frameworks totalling SEK 7.3 billion. In October 2014, Ei made decisions on revenue frameworks amounting to almost SEK 6 billion. Four out of nine natural gas utilities appealed against Ei's decisions to the Administrative Court in Linköping. The Administrative Court passed its judgements in February 2016. The judgements mean that Ei won its cases in respect of important elements with regard to these companies' returns. However, the court ruled against Ei with regard to depreciation periods and some aspects of the cost of capital. Ei is of the opinion that the revenue frameworks, with application of the judgements of the Administrative Court, are at a level that gives companies the opportunity to impose unreasonably high charges on their customers.

Both Ei and the companies appealed against the judgements to the Administrative Court of Appeal in Jönköping in 2016. In December 2016, the Administrative Court of Appeal announced that it was rejecting Ei's request for the Administrative Court to use independent economic experts. In November 2017, the Administrative Court of Appeal in Jönköping passed its judgements in cases where, among other things, they established longer depreciation periods for the transmission network company and a higher return compared with the decisions made by Ei. Ei appealed against the judgements to the Supreme Administrative Court in December 2017. In April 2018, the Supreme Administrative Court announced that it would not grant Ei leave to appeal. The appealed decisions were accordingly referred back to Ei. Therefore, in 2019, taking into account the stipulations set out in the Administrative Court of Appeal's judgements, Ei established the revenue frameworks for the companies, with a cost of capital of 6.91–7.02 per cent, and with longer depreciation times for the transmission network company. Companies that did not appeal their decisions were allocated a cost of capital of 6.26 per cent according to the original decision. The end result of these stipulations, and actual outcome instead of the forecasts of the original decisions, consisted of total revenue frameworks for 2015–2018 of approximately SEK 6.09 billion (2017 price level). During 2019/2020, Ei also compared the final revenue caps for 2015–2018 with the revenues for the period, and made additional decisions that affect the revenue caps for the 2019–2022 period.

Prior to the regulatory period of 2019–2022, the companies applied for revenue frameworks totalling SEK 6.41 billion at the 2017 price level. During 2019, Ei decided on revenue caps of approximately SEK 6 billion. Six out of nine companies appealed against the decision to the Administrative Court in Linköping. In its judgement of 17 May 2019 (case no. 7369-18), the court upheld the appeal that the regulatory depreciation period should be 90 years for distribution pipelines and 40 years for metering and regulating stations for both transmission and distribution when calculating the revenue framework for the regulatory period of 2019–2022. The decisions were referred back to Ei, and in February 2020, taking into account the stipulations set out in the Administrative Court's judgement, Ei established the revenue frameworks for the companies at approximately SEK 6.05 billion.

According to the Swedish Natural Gas Act,⁹⁷ gas utilities are obliged to prepare separate financial accounts for their transmission, distribution, storage and gasification activities in the form of an annual report. These annual reports must be submitted to Ei no later than seven months after the end of the fiscal year, and they must include a complete income statement and balance sheet for each accounting entity. This report forms a basis for further supervision.

Regulated access to storage and gasification facilities

A party in possession of a storage facility or the capacity to store natural gas in a pipeline is obliged to store natural gas on behalf of others on reasonable terms. Likewise, a party in possession of a gasification facility is obliged to feed natural gas into a natural gas pipeline. These obligations do not exist if there is no capacity in the storage or pipeline facility.

2.1.5 Cross-border issues

Ei pursues cross-border cooperation through ACER and CEER. There are also ongoing discussions with the Danish regulatory authority on how the collective market can be developed, and in what way security of supply can be improved in the Danish-Swedish area.

The aim of the cross-border cooperation is to coordinate the rapid transposition of European legislation and to identify areas that need to be developed. Through the cooperation body ACER, Ei has participated in the work to implement the European regulatory frameworks for the internal market for natural gas, among other things.

Projects of common interest

See section 0 for an introduction on projects of common interest.

⁹⁷ 2005:403 Chap. 3 section 3

The LNG terminal⁹⁸ at the Port of Gothenburg is a PCI project that entered into service in autumn 2018 and will primarily provide gas for shipping, industries and heavy land transport, and by these means provide them with improved access to natural gas. When fully developed, the total capacity at the terminal will be around 30,000 m³.

2.1.6 Compliance with the Natural Gas Act

Ei is a regulatory authority according to the Natural Gas Act⁹⁹, and it is therefore tasked with ensuring compliance with the same. Ei also supervises the monitoring of compliance with the Regulation¹⁰⁰ on conditions for access to the natural gas transmission networks. The instruction for Ei specifies that the authority, in its field, must perform tasks pursuant to the Internal Market in Gas Directive¹⁰¹.

According to the Internal Market in Natural Gas Directive and national provisions, the national regulatory authority must comply with and implement the legally binding and relevant decisions made by the ACER and the European Commission.

According to the Natural Gas Act¹⁰², Ei may issue injunctions as necessary in order to ensure compliance with the regulations and conditions subject to supervision. Penalties may be applied in respect of such injunctions. The Act¹⁰³ also stipulates that the regulatory authority has the right to request and receive the information and view the documents it needs in order to carry out supervision. The regulatory authority may also issue injunctions as necessary in order to ensure compliance with the regulations subject to supervision.

⁹⁸ An LNG terminal is a facility for the receiving and distribution of natural gas in liquid form, frequently transported by sea, road or rail. LNG terminals can also be connected to natural gas networks.

⁹⁹ Natural Gas Act (2005:403), Chap. 1 section 9.

¹⁰⁰ Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005.

¹⁰¹ Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

¹⁰² 2005:403 Chap. 10 section 3.

¹⁰³ 2005:403 Chap. 10 section 2.

2.2 Wholesale market for natural gas

Natural gas covers some 2 per cent of Sweden's total energy need and is therefore a relatively small source of energy. However, natural gas represents more than 20 per cent of final energy consumption in municipalities where the natural gas network is developed, which is in line with the average throughout the rest of Europe. The Swedish natural gas market is closely interlinked with the Danish market.

2.2.1 Monitoring of price development, transparency and competition

Sweden does not produce any natural gas of its own; instead the supply comes from Denmark via a pipeline beneath Öresund (from Dragør). The natural gas consumed in Sweden therefore mainly comes from the Danish gas fields in the North Sea.

The Swedish natural gas market is closely linked with the Danish market due to the design of the Swedish network. The balance administrators in the Swedish natural gas system are also active on the Danish gas market. Up until the turn of the year, 2019/2020, natural gas was primarily traded on the Danish gas exchange, ETF PEGAS (previously Gaspoint Nordic).¹⁰⁴ On 1 January 2020, ETF PEGAS was integrated into the European Energy Exchange (EEX).¹⁰⁵ Competition, price development, and transparency in the Swedish natural gas market are largely dependent on developments in Denmark.

There is technical capacity to transport approximately 32 TWh of natural gas annually from Denmark to Sweden via the pipeline from Dragør. Table 9 below shows energy consumption, production, and the total import capacity of natural gas in Sweden during 2008–2020.

Table 9. Transmission of natural gas 2008-2020 9. Transmission of natural gas 2008-2020¹⁰⁶

Year	Total energy consumption (TWh)	Production	Import capacity, total (TWh)
2008	10.3	0	15
2009	13.9	0	15
2010	18.7	0	22
2011	15	0	22
2012	12.9	0	22
2013	12.3	0	22

¹⁰⁴ <http://www.gaspointnordic.com/1-news/successful-launch-of-danish-etf-contracts>

¹⁰⁵ <https://www.eex.com/blob/102488/30a6c9e4eef8727915a33d2085f546b4/20191209-ci-latest-legal-and-technical-information-one-data.pdf>

¹⁰⁶ As a result of Sweden changing over to a common balancing zone together with Denmark, there was an increase in pressure in 2019. There is no longer any pressure regulation between the countries, after which, Sweden now has the full pressure that exists in Denmark. This explains the higher import capacity on the Swedish side, while energy consumption is basically unchanged.

Year	Total energy consumption (TWh)	Production	Import capacity, total (TWh)
2014	10.2	0	22
2015	9.3	0	22
2016	10.6	0	22
2017	8.7	0	22
2018	9.2	0	22
2019	9.0	0	32
2020	8.1	0	32

Source: Energinet and Swedegas

Natural gas in Sweden is mainly used by industry and at CHP plants, while only a few per cent is used by households. There is therefore a strong link between the weather – particularly in winter – and natural gas consumption in Sweden. Natural gas consumption during 2020 fell by 0.9 TWh compared with 2019.

Trading in natural gas

In 2020, natural gas was traded on EEX. A stakeholder can use this platform to purchase gas on the same day as delivery, the day ahead, before the weekend, and before the next month, as well as in futures contracts with delivery up to 6 years in the future. The Danish virtual trading point, ETF, is still on EEX, offering the same products as before. All trade takes place with physical supply and stakeholders must have contracts with the Danish transmission network operator, Energinet.

The balancing of gas takes place within the common balancing zone in Sweden and Denmark, and is managed by the so-called Balancing Area Manager (BAM), which uses the Danish virtual trading point ETF in order to manage the balancing of the gas market. BAM is administered jointly by Energinet and Swedegas.

Stakeholders need to book capacity in Dragør if they want to transport natural gas to Sweden. The transmission capacity is auctioned off at Energinet's regular capacity auctions. In order to be able to transport gas from Denmark to Sweden, balance administrators must also be registered as shippers with Energinet.dk. As things stand at present in terms of consumption, there is no risk of transmission bottleneck problems due to low consumption in relation to the transmission capacity of the system. When it has arrived in Sweden, the gas can be sold on to consumers, such as industries and gas distributors.

2.3 The end-customer market

The final stage in opening up the end-customer market for natural gas to competition took place in July 2007. Since then, all natural gas customers in the Swedish natural gas system have been free to choose their natural gas supplier.

It has previously been reported that the western Swedish natural gas network has approximately 40,000 customers. It has previously been reported that Stockholm's gas network has approximately 61,000 customers.

2.3.1 Monitoring of price development, transparency and competition in the market

A small market

The western Swedish natural gas network has approximately 34,000 household customers¹⁰⁷ and 4,800 are other customers such as major industries and CHP plants¹⁰⁸. The City of Stockholm urban and vehicle gas network has previously been reported as having approximately 61,000 customers, of which around 820 are corporate customers, and 10 of these are industries¹⁰⁹.

There were a total of seven stakeholders¹¹⁰ in the Swedish end-customer market for natural gas at the end of 2020, six of which are in the western Swedish natural gas network, and one is in the City of Stockholm urban and vehicle gas network.

The gas trading market is subject to competition, and customers in the western Swedish network are free to switch supplier. However, this is not possible in Stockholm as it only has one supplier. Statistics on supplier switching for natural gas have previously been available but are no longer published. Previously, the amount of changes was as in Figure 20. Ei receives very few queries and complaints from consumers about gas trading and gas networks, normally only a few per region per year.

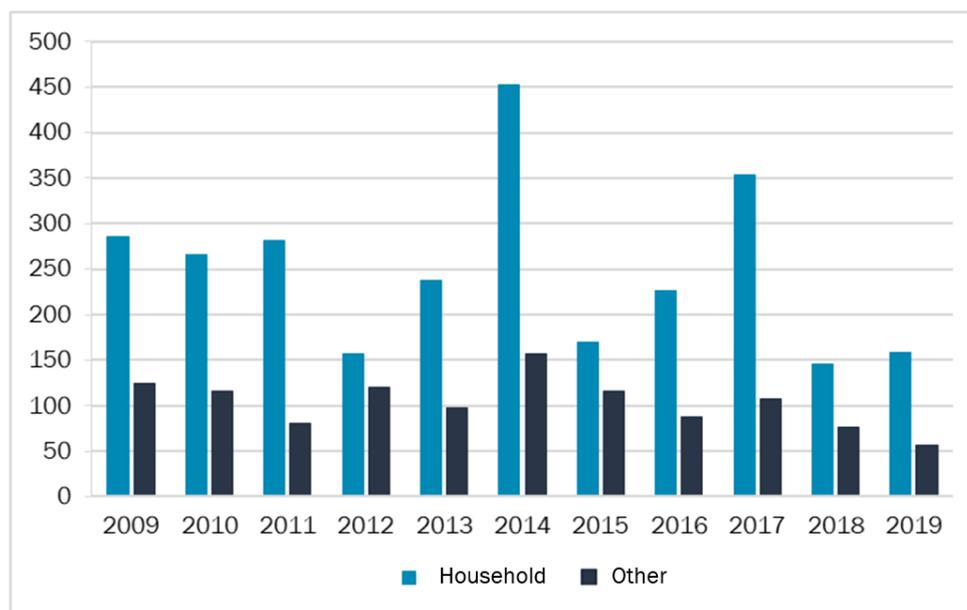
¹⁰⁷ Source: Swedegas

¹⁰⁸ Energigas, via Ei 2018:08

¹⁰⁹ Source: Gasnätet Stockholm AB

¹¹⁰ ApportGas, Eon Försäljning Sweden AB, Göteborg Energi, Kraftringen Energi AB, Varberg Energi, Öresundskraft, Stockholm Gas

Figure 20. Number of changes of supplier for natural gas 2010 - 2019



Source Statistics Sweden

Development of natural gas prices

As can be seen in Table 10, natural gas prices have increased. This can be explained by both rising prices and increased taxes on natural gas.

Table 10. Prices for natural gas for household customers 2017 - first half of 2020¹¹¹

Half year	<5 500 kWh annual consumption			5,500–<55 000 kWh annual consumption		
	Trade price	Network price	Total	Trade price	Network price	Total
2017 January–June	45	115	160	38	78	116
2017 July–December	48	125	173	37	72	109
2018 January–June	61	120	181	46	68	114
2018 July–December	52	144	196	50	69	119
2019 January–June	62	164	227	53	71	124
2019 July–December	59	156	215	51	67	117
2020 January–June	62	166	228	53	72	125

Easy to compare natural gas prices for households

The Swedish Consumer Energy Markets Bureau has been running the website gaspriskollen.se since 2014, where household customers can compare natural gas prices from all natural gas trading companies in Sweden. This website also

¹¹¹ Source Statistics Sweden. The table shows the average total price paid for natural gas by household customers, per half year. The total price includes natural gas, networks, energy and carbon dioxide tax, and VAT. The price is stated in öre/kWh.

includes information on how to switch gas trading companies, as well as information about the various expenditure items in the price of gas.

2.4 Recommendations for natural gas prices, plus investigations and measures for promoting competition

Ei works in cooperation with other authorities to supervise the natural gas market and make it effective.

2.4.1 Ei monitors the natural gas market

According to EIA's instruction, the authority is tasked with monitoring and analysing development in the natural gas market and submitting proposals for amendments to regulatory frameworks, or other measures, in order to promote the function of the market. The instruction also states that Ei should act to promote effective competition in the natural gas market.

Common balancing zone between Sweden and Denmark

Among other things, the implementation of the common balancing zone has meant that the valve in Dragør has been fully opened, leading to equal flow pressure in both systems. The average pressure in the western Swedish system increased from 56 bar to 70 bar, which strengthens security of supply. Through the implementation of the project, the transmission tariffs between Denmark and Sweden have also been removed. The purpose of this was to create a more liquid balancing market with greater reliability of supply; primarily on the Swedish side, where administration will become more efficient and competition will also increase, benefiting end-customers.

In the spring of 2020, a situation arose in the gas market whereby prices on the trading exchange were low and the market was well supplied, at the same time as the fill levels in stock were high. This resulted in an adjustment of the balance model in order to handle any negative reference prices on ETF¹¹².

Baltic Pipe is an infrastructure project aimed at creating a new connection for gas supplies in the European market. Baltic Pipe will lead to an increased gas flow and the risk of larger fluctuations during the 24-hour gas day. This means that the balance model for gas is under review by Energinet and Swedegas, who are proposing a method called Within Day Obligations (WDO). A new balance model is expected to be in place by 1 October 2022, following approval from the Danish and Swedish regulatory authorities ¹¹³.

¹¹² When gas prices approach zero, there is less incentive for the balance provider to trade itself into balance, and there was therefore a need for a change to be made.

¹¹³ <https://en.energinet.dk/Gas/Gas-news/2021/04/12/Balance-metode>

2.5 Security of supply, natural gas

Although security of supply has been good historically, the Swedish natural gas market can be said to be vulnerable in both the short and the long term. The situation whereby the country has a single point of supply, along with the fact that Sweden does not produce its own natural gas, makes the Swedish natural gas market vulnerable to external interruptions in the short term, particularly with regard to production stoppages in the Danish natural gas fields. In the longer term, gas supplies from Denmark will decline as the natural gas fields there are gradually depleted.

2.5.1 Monitoring the balance between supply and demand

The Swedish Energy Agency is a regulatory authority according to the Act on a secure natural gas supply¹¹⁴. In accordance with the requirements of the natural gas supply regulation¹¹⁵, a national preventive action plan and a national crisis plan for safeguarding the supply of natural gas supply was published in 2012. The preventive action plan was updated in 2014 with an up-to-date risk assessment.

2.5.2 Expected future demand and supplies, plus input capacity

In 2016, Swedegas AB submitted an application to Ei for a permit to construct and operate a natural gas pipeline for the transmission of natural gas from the LNG terminal in Gothenburg to the natural gas transmission network. In the first quarter of 2018, Swedegas AB supplemented its licence application with an extension of the licence area to also include pipelines out to quay berths. The application was prepared by Ei and was submitted with observations in 2018 for government review. In 2019, the government rejected the application to connect the gas terminal in Gothenburg to the Swedish transmission network on the grounds that it was contrary to the Swedish Parliament's climate objectives.

2.5.3 Harmonised transmission tariff structures for gas

In March 2017, the European Commission issued Regulation (EU) 2017/460 establishing a network code on harmonised transmission tariff structures for gas. The purpose of this regulation is to use binding EU rules to assist with market integration and improved security of supply, and also to promote interlinking between the European gas networks. Among other things, this regulation specifies rules for transmission tariffs, application of a reference price methodology, requirements for consultation and publication. In Sweden, Swedegas is covered by the regulation.

In December 2018, Ei decided to approve Swedegas's proposal to use a balanced reference price method as the reference price method for the transmission network in Sweden.

¹¹⁴ Act (2012:273) on the security of natural gas supply.

¹¹⁵ (EU) 994/2010.

2.5.4 Measures for covering demand peaks or supply deficits

Consumption peaks and shortages of supply from the balance providers are handled by the balancing scope available in the transmission pipelines, known as linepack. If measures beyond this are required, the system balance administrator uses market mechanisms as far as possible in order to deal with imbalances. The Swedish Energy Agency is able to order network owners to restrict or shut off natural gas transmission to industrial customers. If this is done, the supply to consumers must be secured.

Implementation of safety measures

Owners of natural gas pipelines, storage facilities or gasification facilities must plan for management of the operation and safety of their own facilities in a crisis.¹¹⁶ Owners must compile a crisis action plan and ensure that this plan is distributed within their own organisations, as well as compliance with the plan. Owners must also notify the authorities and other relevant stakeholders about their plans.

¹¹⁶ Regulations are outlined in the Swedish Energy Agency's regulations and general guidelines on the security of natural gas supply, STEMFS 2016: 1.

3 Consumer protection and dispute resolution

Consumers mainly come into contact with the electricity and natural gas market in connection with invoicing of network and trading charges, when changing suppliers, and when moving house.

It must be possible for consumers to feel secure in the knowledge that there is compliance with defined rules. The Swedish Energy Markets Inspectorate (Ei) is helping to strengthen the position of consumers in the markets by means of supervision and information about the energy market, and also by developing the regulatory framework.

3.1 Consumer protection

A number of consumer provisions were implemented in the Electricity Act and the Natural Gas Act in 2011 as a consequence of the EU's third internal market directive for electricity and gas. In its capacity as a regulatory authority, Ei must work with other relevant authorities and help to ensure that consumer protection measures are effective and implemented.

Ei must also inform consumers of how to switch to a different electricity or natural gas trading company, the cost of connecting to a network, and how consumers can report their supplier or network company.

3.1.1 Elpriskollen

Ei offers a price comparison website, elpriskollen.se, to strengthen the position of consumers in the electricity market, allowing consumers to compare the prices and terms of the most common contracts from all electricity suppliers.

The option of comparing prices and other factors that may influence the choice of electricity trading company is a prerequisite for active customers. This is why Ei is constantly working on developing and improving its price comparison website to make things easier for consumers and allow them to perform extended searches. Price comparisons can currently be made in 13 different languages. In 2020, the number of unique visitors was 210,000.

Ei also carries out regular checks of the reported prices and associated terms and conditions in order to ensure that electricity suppliers are reporting correct information. Checks have been carried out during the year of electricity supplier prices and contract terms and conditions. Electricity suppliers have been encouraged to rectify any shortcomings detected, and they have done so in all cases. All electricity suppliers who deal with consumers are obliged to report prices and terms and conditions for the contracts covered by Ei's regulations on reporting¹¹⁷ (which is the vast majority of electricity contracts, such as variable and fixed contracts, and so-called mixed contracts). Electricity suppliers that do not report a contract covered by the reporting obligation, and new electricity suppliers unaware of their obligations, are contacted by Ei and requested to start reporting in accordance with the regulations and the handbook.

3.1.2 Consumer Contact and Kundo

Ei has a consumer contact function in order to provide a single point of contact for customer queries and complaints. All queries and complaints connected with consumers that are submitted in writing to Ei are referred to Consumer Contact. Queries and complaints from economic operators are also answered. Apart from responding to queries and receiving complaints relating to energy market

¹¹⁷ EIFS 2013:8

stakeholders, this consumer contact can also be used to create a foundation for rule development and supervision for different departments within Ei.

Consumer Contact accepts queries and complaints by email, telephone, social media and the web-based query forum Kundo. Kundo allows consumers to directly search the website, ask questions or look for answers to questions asked previously. The aim is for this method to maintain a high service level, with short response times and relevant answers for consumers.

Ei has an in-depth cooperation with the Swedish Consumer Energy Markets Bureau with regard to handling queries and complaints. Consumers that get in touch via phone and e-mail with queries outside of Ei's areas of responsibility are referred to the bureau. This applies to contractual queries where Ei lacks the authority to act in the case. Such queries via Kundo are also handled by the Swedish Consumer Energy Markets Bureau.

During 2020, Ei had 1,428 instances of contact with consumers. These instances of contact were divided between the areas of electricity networks, electricity supply, elpriskollen.se, district heating, gas networks, and gas supply. Consumer contacts are sorted into queries or complaints. A query is when the customer wants to know about something; and a complaint is when the customer expresses dissatisfaction. In 2020, there were a few more queries than complaints. Electricity networks and electricity supply are the most common areas for queries and complaints. The instances of consumer contact regarding electricity network charges may, for example, concern an increase in these charges, the level they are set at, the difference in charges between different network areas, or the various elements of the charges such as the variable element, the fixed element, or the charge for output power. Consumer contacts about electricity supply are usually about unfair commercial practices, which sometimes occur in outreach sales, electricity price levels, and contract terms, such as unfair contract terms or lack of information about the contract terms.

3.1.3 Reports to Ei

Besides asking questions about the energy markets, consumers can also report any company failing to comply with the provisions of the Electricity Act and the Natural Gas Act, for which Ei is responsible. As the authority responsible for supervision, Ei can then examine whether the company has breached its statutory obligation.

3.1.4 Complaints and queries report

In 2020, Ei published the report *The consumer in the electricity market - Complaint statistics 2016–2019* (Ei R2020:04) which explains how the complaint and query statistics reflect the energy market, among other things. Ei only receives some of

the queries and complaints from consumers because much of the contact is handled directly between the customer and the energy company, but Ei still considers them a relatively accurate reflection of the view of the energy market held by customers. Consumer objections and queries on electricity utilities often concern the regulation and level of tariffs, while complaints about electricity trading companies often concern unfair commercial practices. Unfair commercial practices include the imposition of unfair contract terms by electricity suppliers, or a change of electricity supplier without the consumer's approval. The majority of all complaints are accounted for by a small proportion of electricity suppliers.

The contacts with customers mean that Ei can concentrate its supervision and its work on rule development to areas where they are most useful.

3.1.5 Help to vulnerable customers

The Swedish definition of vulnerable customers is outlined in Ei's instructions, which state "vulnerable customers are individuals who are permanently incapable of paying for the electricity or natural gas transmitted or supplied to them for purposes that fall outside business activity". In the Swedish electricity and natural gas market, this consumer category is protected by social legislation, ensuring that consumers have the right to financial assistance in order to manage their electricity and natural gas supply. Ei has previously estimated that approximately 20,000 consumers are covered by the Swedish definition of the term.

Both the Electricity Act and the Natural Gas Act also include provisions that protect consumers at risk of being disconnected from the electricity or natural gas network due to failure to pay or any other significant breach of contract. These provisions mean that any company disconnecting such consumers must first follow a specific statutory procedure. Among other things, this includes the consumer's right to correct information from the company and giving the consumer the opportunity to remedy the situation without being disconnected; and the company must send a message to social services in the municipality in which the consumer lives before disconnection can take place.

Sweden has been described as the country in the EU with the lowest level of energy poverty in households with low incomes.¹¹⁸

3.1.6 Swedish Consumer Energy Markets Bureau as a national point of contact

Ei has continued its work as one of the principals of the Swedish Consumer Energy Markets Bureau in 2020. This is an independent bureau providing information and guidance to consumers on issues relating to the electricity and natural gas market.

¹¹⁸ OpenExp, www.openexp.eu/eept

Advice to consumers is free-of-charge. An agreement is already in place between Ei and the Swedish Consumer Energy Markets Bureau, which means that the bureau is the national point of contact for the electricity and natural gas market. By these means the requirements for this are met in accordance with the EU's Internal Market in Electricity and Gas Directive. In 2020, the agency's website had 650,000 unique visitors, which was a significant increase compared to 2019 when it had 430,000 visits from unique users. Over 3,800 consumers got in touch with the bureau directly by telephone and email. This represents an increase of almost 1,000 cases. Small businesses accounted for approximately 22 per cent of contacts in 2020. One explanation for the increase given by the Swedish Consumer Energy Markets Bureau is that only a few electricity suppliers and intermediaries are responsible for generating an unusual number of serious complaints. For example, these complaints have concerned "fraudulent invoices, threats to forward invoices to debt collection and the Swedish Enforcement Agency, threats of disconnection, and complaints about situations where individual companies claim to have a valid contract even though the customer has never been in contact with the company, or has only approved further information from the company".¹¹⁹

In the event of a large number of and recurring complaints, the Swedish Consumer Energy Markets Bureau sends reports to the companies concerned and in some cases has held dialogue meetings. When there are reasons for doing so, the bureau informs consumers about the possibility to report the case to the regulatory authority or to request adjudication of the dispute with the National Board for Consumer Complaints (ARN).¹²⁰

The Swedish Consumer Energy Markets Bureau publishes quarterly complaint information about individual electricity suppliers.¹²¹ The purpose of this is to show which electricity suppliers are subject to the most complaints, and to give advice to customers who have or want to sign a contract with one of the electricity suppliers. The bureau also describes the type of problems that customers encounter with these electricity suppliers. The number of complaints must have exceeded a set minimum level in order for the electricity suppliers to be included in the complaint information. The Bureau first checks whether there are any grounds for the complaints before publishing complaint information about an electricity supplier.

The Swedish Consumer Energy Markets Bureau has also continued to report summaries of consumer problems on the energy markets to authorities and companies throughout the year. These efforts have created opportunities for companies to take action to reduce complaints. For Ei, this – together with the -

¹¹⁹ The Swedish Consumer Energy Markets Bureau. Annual Report 2020

¹²⁰ The Swedish Consumer Energy Markets Bureau. Annual Report 2020

¹²¹ www.energimarknadsbyran.se/el/dina-avtal-och-kostnader/valja-elavtal/klagomalsinformation/

authority's own summaries of consumer complaints – means that it has been possible to implement supervisory initiatives in areas where they will be of most benefit.

3.1.7 Other consumer advice

Among other authorities, the Swedish Consumer Agency in particular is responsible for consumers in the electricity and natural gas market. Among other things, this means that the Swedish Consumer Agency reviews whether companies have used misleading or aggressive marketing, applied unreasonable contract terms, or provided inadequate price information.

The Swedish Consumer Agency runs a central consumer information service by the name of Hallå konsument [Hey consumer].¹²² Hallå konsument covers the energy markets and includes all consumer markets as well. Consumers can consult Hallå konsument with questions relating to purchases, contractual terms, and complaints.

Other authorities, including Ei, are responsible for cooperating with the Swedish Consumer Agency in the development of Hallå konsument. The Swedish Consumer Energy Markets Bureau is responsible for answering questions referred from Hallå konsument, as well as for some of the information on the Hallå konsument website.

Consumers in the electricity and natural gas market also have the opportunity to consult their local municipality for advice on various issues. Among other things, consumer advisers there offer advice before consumers sign contracts, as well as advising on disputes. Budget and debt advisers are able to offer advice and support if people have payment problems, while energy and climate advisers are able to offer analysis of energy consumption and advice when choosing a new form of heating. Another advisory function is the Swedish Energy Agency's Solelportalen (Solar Electricity Portal). There, consumers can find information about solar cells and calculate the investment decision prior to purchasing solar cells for their houses.

¹²² www.hallakonsument.se

3.2 Dispute resolution

On their websites and invoices to consumers, electricity suppliers, network operators, gas suppliers and gas network operators must provide clear information on consumer rights, how consumers can go about submitting complaints, and who consumers can consult for information or dispute resolution.

Consumers can consult the Swedish Consumer Energy Markets Bureau or their municipal consumer adviser for information and guidance.

3.2.1 Ei adjudicates on some dispute issues

Ei makes sure that companies in the electricity and natural gas markets operate in compliance with legislation, and in some cases also has a dispute resolution function between consumer and supplier. This relates to disputes on issues relating to the obligation of network operators to connect a facility to the electricity network, the cost of metering and calculating electricity, remuneration on electricity in-feed, and network tariffs for smaller production facilities.

According to the provisions of the Electricity Act, the connection charge must be reasonable.¹²³ If a consumer feels that the cost is too high, he/she can consult Ei, who will then adjudicate on this. If Ei concludes that the connection charge is too high, the electricity utility must pay the difference back to the consumer. It is possible to appeal against Ei's decision on a reasonable connection charge, and the courts have the final say. Requesting Ei adjudication and appealing against Ei's decisions are free of charge.

3.2.2 Dispute resolution support at the National Board for Consumer Complaints (ARN)

Consumers in the electricity and natural gas market can report disputes with suppliers to the National Board for Consumer Complaints (ARN). Reports of this kind are quick and easy, but they are nevertheless a legally certain alternative to going to court. ARN is a state authority that examines disputes between customers and suppliers in the electricity and natural gas market, among others, free of charge. ARN does not perform its own investigation of what has happened; it is up to the parties to submit and present the information on which the board is being asked to make a decision. The board works on the basis of applicable legislation and legal practice when assessing disputes. In its decision, the board provides a proposal on how the dispute should be resolved. For consumers to be able to report a dispute to the National Board for Consumer Complaints (ARN), the company has to have rejected the consumer's claim or not responded at all to the consumer, the report must have been received no later than 6 months from the date on which the company refused the consumer's claim, and the claim must be of a

¹²³ 1997:857 Chap 4. section 9

value above the limits of SEK 500, SEK 1,000 or SEK 2,000, depending on what the report relates to.

Consumers usually have to wait for about 6 months for ARN decisions on cases. Consumers can also consult an ordinary court of law in order to resolve a dispute with an electricity or natural gas company. A trader only has the option of an ordinary court of law for dispute resolution, which involves certain risks, as it can become a costly process.

