

The Swedish electricity and natural gas markets 2012

The Swedish Energy Markets Inspectorate
Box 155, 631 03 Eskilstuna, Sweden
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Foreword

The Swedish Energy Markets Inspectorate (*Energimarknadsinspektionen*, Ei) is the agency that regulates the electricity, natural gas and district heating markets in Sweden.

Ei's role involves carrying out the duties placed on it by the electricity and natural gas market directives. This includes, for example, the production of an annual report in accordance with the reporting requirements that result from these directives. This report uses the structure that has been worked out in collaboration with the other European regulatory agencies and the European Commission. The aim of this report is to provide an account of the development of the electricity and natural gas markets in Sweden over the course of 2012.

Within the context of European cooperation, a report summarising all of the national reports will be published in the autumn of 2013. This report, together with the national report of each Member State, will be available from the website of the Council of European Energy Regulators (CEER): www.energy-regulators.eu.

Eskilstuna, June 2013



Anne Vadasz Nilsson
Director-General



Elin Söderlund
Analyst

Summary –

The development of Sweden's electricity and natural gas markets

Trade is subject to competition in the Swedish electricity and natural gas markets. Electricity and natural gas- networks are regulated monopolies, as it would be both economically and environmentally inappropriate to build parallel networks across the country.

In its role as a regulator, Ei must continually monitor and analyse the development of the electricity and gas markets and submit proposals for changes or other measures that may improve the way the markets function. Ei is also charged with the role of working to promote effective competition in the electricity and natural gas markets.

The electricity market

The Swedish electricity market was reformed in 1996. Since then, supply and production of electricity have been exposed to competition.

The Swedish electricity network consists of 545,000 kilometres of power cables, of which 329,500 km are underground cables and 215,500 km overhead lines. Svenska Kraftnät (SvK) is the State-owned utility that owns the Swedish national grid, and is responsible for maintaining the balance between production and consumption of power, as well as for the operational safety of the Swedish electricity transmission system. SvK is certified as a national network company by Ei. In its role as a regulator, Ei has the task of scrutinising SvK.

Local and regional network companies are responsible for sufficiently maintaining their networks to ensure that each connection within their individual networks, at all times, have access to electricity according to given quality standards. As of 2012, there were 168 electricity network companies in Sweden.

Ei has investigated the long-term power cuts which followed the winter storms of 2011/2012

Between November 2011 and January 2012, Sweden was hit by several powerful storms. In total there were 1.9 million power supply cuts over the course of this period. Of these, about 79,000 lasted longer than 24 hours which is the legally stipulated maximum duration of an interrupted power supply. In 2012, Ei began an investigation of the power cuts that took place during the storms and requested details of these from a large number of network companies. The analysis of the investigation indicated that it was primarily local networks that were affected during the storms. The main cause for interruptions was trees that had fallen on uninsulated overhead lines. The five network companies that had the greatest number of long power cuts have been ordered by Ei to provide a plan showing how they intend to resolve these deficiencies.

Network fees

Electricity network fees often consist of a fixed portion (subscription fee) and a variable portion (electricity transmission fee). The fixed portion varies with the size of the fuse or the volume of power subscribed to. The variable portion changes in line with the customer's usage. For a detached house with electric heating, the fixed and variable portions of the fee are about the same.

The network fee has been increasing steadily over the last fifteen years. In terms of the actual increase in price, the network fee increased by an average of 3.9 per cent between 2012 and 2013 for customers living in apartments, which corresponds to an increase of about SEK 50 per year and household.

As of the 1st of January 2012, Ei has regulated electricity network companies' fees in advance. The regulatory model involves Ei decreeing in advance how much revenue the companies may receive over the course of a four-year period. The first regulatory period runs from 2012 to 2015. The decision on revenue limits for this period was made by Ei at the end of October 2011. In this, Ei set the maximum level of revenue that Sweden's local and regional network companies may receive from their customers for network transmission during the regulatory period.

Appeals were lodged at the Administrative Court in Linköping for about half of the decrees that were announced. The court proceedings are ongoing.

Increased electricity trade in the Nordic region

The Swedish wholesale market is one part of an integrated Nordic electricity market that is, in turn, part of an increasingly integrated European electricity market. On the Nordic electricity exchange Nord Pool Spot, electricity is bought and sold by players in the Nordic countries. A high turnover on Nord Pool Spot increases confidence in the price quotations that are being formed in the market. Nord Pool Spot's share of the exchange market was about 77 per cent of the total consumption for 2012. The total volume traded at Nord Pool Spot was 338.2 TWh, which was an increase of about 13 per cent over the previous year.

Record production contributed to low spot prices

In 2012, production of electricity in Sweden broke the record for the largest amount of energy ever produced in one year. Total electricity production rose to 162 TWh, which represented an increase of about 10 per cent, compared to 2011. Hydro-electric production was responsible for the greatest proportion of the increase, 18.1 per cent, which represented an increase of 12 TWh. After hydro, wind-power had the second largest percentage increase, 18 per cent, which corresponds to an increase in production of 1.1 TWh. Of all the electricity produced, a total of 142.2 TWh were consumed in Sweden. This represents an increase of about two per cent in electricity consumption, compared with 2011.

The high internal production resulted in a net outflow of electricity from Sweden of 19.6 TWh, which was more than double the previous year's net exports, 7.2 TWh. This part of the Swedish electricity balance was also a record.

Price fluctuations over the course of the year were, as usual, substantial. The price was higher during the winter months and lower during the summer months. The

average system price (which is the common Nordic spot price of electricity) was 27.2 öre per kWh; much lower than in 2011, when the average price was 42.3 öre per kWh. For the first time since 2007, the average price for the year was below 30 öre per kWh. The lower price was due to the high level of production from hydro-electric power stations in Sweden, combined with a great deal of precipitation and normal temperatures. Depressed consumption and continued expansion of wind-power capacity also contributed.

Proportion of the time with common pricing

As a result of the limitations to transmission capacity in the Nordic region, the Nordic electricity market is divided into bidding areas. Prices are determined by production and consumption within the respective zone, as well as the capacity to transmit power to and from that zone. At the Nordic level, the electricity price in 2012 was the same in each of the Nordic pricing zones 25 per cent of the time. This ratio was about the same as the year before.

It is unusual for the Swedish bidding areas to be completely isolated and constitute individual pricing areas. Over the course of the year, Sweden had the same electricity price in all four of the bidding areas for 83 per cent of the time. Bidding area 1 and bidding area 2 had the same price 98 per cent of the time, while bidding area 4 was isolated from all the other Swedish bidding areas 11 per cent of the time. There were three different electricity prices in Sweden for 1.1 per cent of the time. Price differences appear when the limitations to transmission combine with periods of high load, cold winter weather, spring floods or limited availability of nuclear power capacity, which is an important source of supply for the south of Sweden.

Several agencies supervise the electricity markets

Several agencies and public bodies collaborate in the supervision of the Swedish and Nordic electricity market with the aim of creating, using various measures, a well-functioning electricity market and preventing the exercising of market power.

Ei has the collective responsibility for the regulation and supervision of the Swedish electricity market and the implementation of the Electricity Act. The Swedish Competition Authority (*Konkurrensverket*) is responsible for ensuring that competition regulations are adhered to. The Swedish Financial Supervisory Authority (*Finansinspektionen*) regulates Swedish players who act, with the authority's permission, in the financial electricity market. The Swedish Consumer Agency (*Konsumentverket*) also participates in the supervision of the electricity market, for example, by ensuring that consumers are offered fair contractual terms. Supervision takes place of trade and the actions of businesses on the exchanges Nord Pool Spot and Nasdaq OMX Commodities.

In 2011 the new Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) came into force, which facilitates coherent supervision of the increasingly integrated European electricity and gas markets. The responsibility of Ei and its continuous work to supervise the Swedish markets has thus increased; Ei has also created a new department to accomplish this duty. In 2012, Ei's cooperation with ACER (the European Agency for the Cooperation of

Energy Regulators) and other countries' regulatory agencies to work out the details of the regulations for implementation and application of REMIT was accredited.

Work on a Nordic consumer market

The Swedish consumer market for electricity, unlike the wholesale energy market, is national. For many years, however, there has been political pressure for the creation of a joint Nordic consumer market by 2015. A joint Nordic consumer market involves customers in the Nordic countries being able to choose electricity supplier freely across national borders. In the fall of 2012, Ei was commissioned by the government to produce a proposal about the changes that are required to Swedish law in order to create the conditions for a Nordic consumer market. A report on this work was submitted to the department in the middle of June 2013.¹ In this report, Ei proposed, for example, that the electricity suppliers become the customer's primary point of contact when changing supplier or moving as well as for billing. The proposal also involves mandatory combined billing.

There are about 5.2 million electricity customers in Sweden. Of these, about 87 per cent are domestic consumers. In recent years, the number of electricity suppliers has remained more or less unchanged. At the end of 2012 there were 121 electricity suppliers, of which 97 per cent sold electricity throughout the country. More than half of all electricity suppliers are companies that are part of businesses that also generate electricity.

Lower electricity cost in 2012

The total electricity cost for households can be divided into the electricity supply price, the network fee, energy tax and VAT. The electricity supply price (including the cost for green certificates) constituted 35 per cent of the total cost of electricity for a detached house with electrical heating in January 2013. The cost of electricity transmission, the network fee, accounted for 22 per cent, while energy tax and VAT together made up 43 per cent.

The total cost of electricity for a detached house with electrical heating (with an annual consumption of 20,000 kWh) was 118.7 öre per kWh on average in 2012, which is equivalent to about SEK 23,700 per year. This was lower than the previous year. In bidding area 4, Malmö, the price was, on average, 6 öre per kWh higher than in the northern bidding areas (1 and 2). The difference between bidding areas 3 and 4 was somewhat lower, below 5 öre per kWh on average.

The proportion of customers with variable price contracts increased by 17 per cent from the previous year. The majority of customers, close to 43 per cent, still had a fixed price - contract. This was a marginal decrease from the previous year, when the proportion of customers with a fixed price contract was 44 per cent. In total, over 1.7 million domestic customers were active in the electricity market over the course of the year, either by changing electricity supplier or by renegotiating a new contract. This corresponds to 37 per cent of the total number of domestic customers in the Swedish electricity market.

¹ EiR2013:09. Enklare för kunden – förslag som ökar förutsättningarna för en nordisk slutkundsmarknad.

Security of supply - electricity

In Sweden, investments in new electricity production capacity take place based on market principles. In order to build a new electricity production facility in Sweden, permission from Ei is required. At the end of 2012, the combined installed capacity of Sweden's power stations was 37,353 MW, which was an increase of 2.4 per cent over the figure from the previous year.

SvK is responsible for ensuring that capacity is available in reserve during the winter. The reserve capacity will be gradually phased out until the 15th of March 2020 and replaced by a market based solution. A new feature in the design of Sweden's reserve capacity since the winter 2011/2012 is that contracted demand reductions are made available for trading on Nord Pool Spot.

The natural gas market

Natural gas was introduced to Sweden in 1985 through an extension of the Danish natural gas system to southern Sweden. The trade in natural gas in the Swedish system has been completely exposed to competition since 2007.

The Swedish natural gas network consists of 620 km of transmission pipeline and 2720 km of distribution pipes. The natural gas network stretches from Trelleborg in the south to Stenungsund in the north and also branches off into parts of Småland. From June 2013, Swedegas AB has taken over responsibility, from SvK, for balancing supply and demand in the core natural gas network. Swedegas has been certified as a national network operator by Ei.

In the 30 municipalities that are supplied with natural gas, it accounts for about 20 per cent of the total energy consumption; this number is in line with the average across the rest of the EU which has a higher penetration of gas in the energy mix.

Distribution companies reserve capacity

The Swedish natural gas network's transmission capacity amounts to 22 TWh per year, which means that there is the potential to increase gas transmission within the existing national natural gas system.

The aim of the Swedish model is that the reservation of natural gas transmission capacity will be similar to the model that is used in Sweden for electricity. There is one certified system operator (TSO) and five distribution companies (DSO) in Sweden. According to the model that is used for natural gas delivery in Sweden, it is the distribution companies who are responsible for reserving capacity in the core transmission system.

As a result of the gas market model that is used in Sweden, there is no second-hand market for transmission capacity in which spare capacity is made available for trading.

Review of gas network fees

Ei regulates the gas network companies and must approve the methods these companies use to calculate their network fees. In July 2013, new rules regarding the advance regulation of the fairness of network fees came into force. Until the 1st of

January 2015 the review is done ex post. The advance review of these methods, which forms the basis of the design of the fees, aims to ensure that they are objective and non-discriminatory.

Reduced natural gas consumption

Sweden does not produce any natural gas of its own; instead all natural gas is imported from Denmark. Biogas production is, however, increasing in Sweden. Between one and two per cent of the natural gas that is distributed in the Swedish natural gas system consists of domestically produced biogas. In 2012, 12.9 TWh of natural gas was used in Sweden, a reduction of 14 per cent from the previous year.

Close to 45 per cent, 5.8 TWh, of the natural gas was used by industry, which was an increase, compared with 2011. Following industry, combined heat and power and district heating facilities were responsible for the second largest portion of the consumption, 36 per cent (4.7 TWh). Domestic customers accounted for 0.6 TWh, 4.5 per cent of total consumption, which was a reduction of 35 per cent from the previous year.

Few players in the natural gas market and reduced customer activity

In Sweden, there are about 37,000 natural gas customers, about 33,400 of these are domestic customers and the remaining are business customers. All natural gas customers have, since 2007, been free to choose natural gas supplier. There were six natural gas suppliers active in the Swedish market in 2012. The three largest natural gas suppliers, E.ON, Dong Energy and Göteborg Energi, share 85 per cent of the market.

Over the course of 2012, Swedish domestic natural gas customers changed supplier 157 times in total, a reduction of 44 per cent, compared with the previous year. The number of changes is at a continually low level and is equivalent to just under half of one per cent of the total number of domestic customers.

Energy tax and VAT comprise the largest proportion of the total household natural gas cost

The total cost of natural gas for a domestic customer can be divided into gas supply price, network fee, tax and VAT. The gas supply price's proportion of the total cost of natural gas increased in comparison with 2011. The gas supply price for a domestic customer constituted 33 per cent of the total cost of natural gas in 2012. The network fee accounted for 20 per cent, while energy tax and VAT, combined, comprised about half of the total cost, 47 per cent.

The total cost of natural gas has increased by about 15 per cent since 2007. In 2012, the total cost for a household with gas heating (with an annual consumption of 20,000 kWh) amounted to about 108 öre per kWh, equivalent to SEK 21,000 per year. This was a marginal decrease, compared with the previous year.

Security of supply - natural gas

There are currently a number of extraction and production projects underway in connection to the Swedish natural gas system. Consumption of natural gas is expected to increase accordingly in years to come. For example, a gasification facility for biofuel is planned for Gothenburg; this is expected to be capable of

producing about 100 MW of gas of a quality that is equivalent to natural gas. A liquefied natural gas (LNG) terminal is currently being constructed in the Port of Gothenburg. The first stage is intended, primarily, to provide LNG for transport, for example, as fuel for boats and vehicles. The second stage will include an LNG regasification plant, which will feed natural gas into the natural gas system on the west coast.

Consumer protection and disputes

Ei's supervision of consumer regulations

Over the course of 2012, Ei has reviewed the electricity suppliers' obligations resulting from the consumer regulations in the Electricity Act and the Natural Gas Act. This supervision has, for example, encompassed the electricity suppliers' obligations to state in their consumer contracts what undertakings they have in relation to the consumer, the terms for invoicing, payment, extension and cancellation, as well as the terms for compensation should the electricity supplier not fulfil their undertakings. In 2012, the number of cases concerning consumer regulations reported to Ei amounted to 17. Once Ei had called their attention to the deficiencies, the electricity suppliers under review took the appropriate measures to rectify them.

A national contact point

The Swedish Consumer Energy Markets Bureau (*Konsumenternas Energimarknadsbyrå*, KE) is an independent bureau that provides information and guidance to consumers on issues relating to the electricity and gas markets. At the beginning of 2012, a new agreement between Ei and the bureau came into force. This means that KE is now the national contact point for the electricity and gas markets, fulfilling the requirements of the EU's electricity and gas markets directives.

The bureau received about 2,300 enquiries from consumers in 2012, primarily relating to the electricity and gas markets, but the vast majority of these concerned the electricity market. About half of the enquiries were complaints about the companies' treatment of customers.

Dealing with complaints

Ei ensures that the companies in the electricity and gas markets follow the law and, in certain cases, resolves complaints between consumers and companies. This concerns, for example, complaints relating to the cost of metering of the consumer's electricity consumption, as well as the fees and terms affecting the consumer in conjunction with their connection to the electricity network.

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The electricity market

The Swedish electricity market was reformed in 1996. Since then, supply and production of electricity has been exposed to competition, while the network is a regulated monopoly. The aim of exposing production and supply of electricity to competition is to increase the consumer's options and create conditions for the efficient utilisation of production resources.

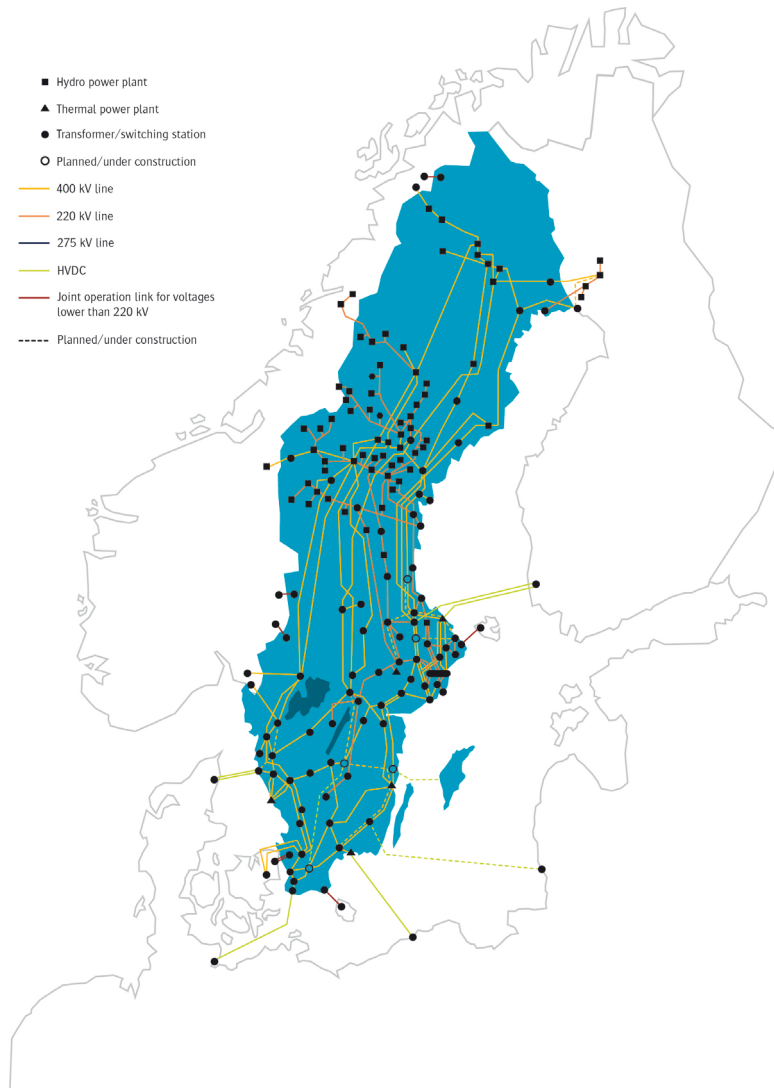
The electricity network is run as a monopoly as it would be both economically and environmentally inappropriate to build parallel electricity networks across the country.

The electricity network

The Swedish electricity network consists of 545,000 kilometres of power cables, of which 329,500 km are underground cables and 215,500 km overhead lines. The electricity network is divided into three levels: the national grid, regional networks and local networks. The national grid transports electricity over long distances with high voltages. The regional networks transport electricity from the national grid to the local networks and, in certain cases, direct to larger electricity consumers. The local networks are connected to the regional networks and transport electricity to households and other customers.

In Sweden, Svenska Kraftnät (SvK) is responsible for maintaining the balance between production and consumption and the operational reliability of the electricity network system. Local and regional network companies are responsible for sufficiently maintaining their networks to ensure that each connection within their individual networks, at all times, have access to electricity according to given quality standards. Figure 1 shows a map of the Swedish national grid's stations and cables, as well as planned additional cables and reinforcements of the grid.

Figure 1. The Swedish national grid



Source: Ei (based on the original from SvK, "Stamnätet i Norden 2012")

As of 2012, there were 168 electricity network companies in Sweden. A total of 164 companies run local networks and eight companies run regional networks.²

Ei regulates the transmission system operator

SvK runs and manages the Swedish national grid. SvK is also the agency that is the transmission system operator for the Swedish electricity network. SvK has the duty to commercially manage, run and develop a cost-effective, operationally safe and environmentally adapted electricity transmission system, as well as to sell transmission capacity and conduct other activities connected to the electricity transmission system. According to the EU Electricity Market Directive, Ei has, in its regulatory role, the task of scrutinising SvK.³ Regulation of SvK has, in 2012, included Ei stipulating a revenue framework for SvK for the 2013 regulatory period. Ei has also approved the methods used in the agreements related to responsibility for balancing supply and demand within the electricity and gas networks. Ei has also approved the methods for the working of the terms of agreements for access to cables or a cable network.⁴

Beginning from 1 January 2012, SvK's revenue framework will be set out in advance, as will those of other electricity network companies. The regulatory period for SvK is one calendar year, while those of the other electricity network companies is four years, according to general principals. Following a change in the law, it is now Ei that also determines the revenue framework for SvK. Previously this was done by the government. On 29 March 2012, Ei released its decision on the revenue framework for 2013.

Ei has certified SvK as a transmission system operator for electricity

According to the EU's electricity market directive⁵, transmission system operators must be certified. Ei received an application for certification from SvK in the autumn of 2011.

As part of the work towards certification, the European Commission⁶ remarked on Ei's preliminary decision in advance of Ei making its final certification decision. The final decision to certify SvK as the transmission system operator for the Swedish national electricity grid was taken by Ei in July 2012. During the decision-making process, Ei investigated whether the fact that the Swedish State is a part-owner of Vattenfall AB and also ultimately responsible for SvK constituted a barrier.⁷ Ei's assessment was that this was not a barrier to the certification of SvK. Certification is valid indefinitely, but it can be reassessed by Ei if the transmission system operator does not live up to the certification requirements.

² Four network companies run both local and regional networks.

³ In Sweden there is no independent transmission system operator. It is, therefore, the regulations that specifically cover the regulation of independent transmission system operators are not applicable to Ei.

⁴ According to Chapter 4, Section 1a of the Electricity Act.

⁵ According to Article 10.

⁶ The European Commission checks that Member States only certify competent transmission system operators.

⁷ SvK falls under the responsibility of the Ministry of Enterprise, Energy and Communications, while the Ministry of Finance is responsible for Vattenfall.

Transmission limitations provide congestion revenue

When there are transmission limitations, so-called bottlenecks, between different bidding areas, congestion revenue arises as a result of price differences between areas. Transmission limitations either occur within Sweden, which leads to internal congestion revenue, or between a Swedish bidding area and a bidding area in another country, which leads to external congestion revenue. When the market is divided into bidding areas, the congestion revenue consists of, for a certain period, the difference in price between the high and low price areas, multiplied by the transmitted volume. The EU regulations only cover external congestion revenue.

In accordance with the regulations⁸ on cross-border trade in electricity, SvK has, together with the other Nordic transmission system operators, decided to invest the revenue from managing bottlenecks in reinforcing their respective national grids and the connections between countries. SvK reported that the congestion revenue for the first half of 2012 amounted to about SEK 920 million. Ei considers this revenue to have been used for purposes that are allowed according to the regulations.⁹ Ei also approved SvK to use external congestion revenue, up to a maximum of SEK 300 million and if the price area risk exceeds SEK 50 million, in order to reduce the national network tariff for 2012. The same type of approval has been granted for 2013, 2014, and 2015.

Security of supply in the electricity network is assessed by Ei based on reports of power cuts

Security of supply is affected, for example, by the type of cable (overhead lines or underground cables) that is used. In order to weatherproof the electricity network, the proportion of underground cables in local networks has increased. However, there is a risk of power cuts even when underground cables are used, for example, if a cable is damaged by digging or construction work. Within the overhead lines category, insulated power lines are more robust than uninsulated power lines. In 2012, about 98 per cent of the total length of low-voltage network in local networks was uninsulated. At the medium and high voltage levels, approx. 65 per cent of the power lines are insulated.

The electricity network companies are, according to the requirements of the Electricity Act, obliged to report power cuts to Ei. Since 2011, annual detailed reporting of power cuts at the customer level takes place, for both short and long power cuts. Long-term and extensive power cuts must be reported continually to Ei.

Reporting enables Ei to assess the quality of supply in the electricity network, as well as allowing it to intervene in a timely manner if the measures that have been implemented are not sufficient to ensure the security of supply in a specific electricity network. The assessment of quality of supply also forms the basis of assessments of the fairness of the network fees. Table 1 shows power cuts in the

⁸ Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003.

⁹ According to the Congestion Management Guidelines with respect to Regulation (EC) 714/2009, Ei will, by 31 July each year, report the bottleneck revenue that SvK has received over the course of the previous twelve months, as well as reporting how this revenue has been used.

local networks from 2000 - 2011. The figures indicate the average value per customer and are divided into announced and unannounced power cuts. Details of announced power cuts are also reported in the table. These are disruptions to the transmission of electricity that are justified for reasons of electrical safety. For example, repairs that have the aim of maintaining good operational safety and security of supply. According to the Electricity Act, power cuts may not last longer than necessary in order to implement a solution.

Table 1. Power cuts in local networks resulting from a fault in the network, average value per customer

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Average number of power cuts per customer												
Announced power cuts	0.19	0.18	0.25	0.19	0.19	0.21	0.19	0.31	0.50	0.22	0.14	0.19
Unannounced power cuts	0.88	1.03	0.97	0.90	0.89	1.26	1.05	1.49	1.04	0.88	1.03	1.31
Average length of power cut per customer												
Announced power cuts	27	27	29	27	25	32	22	22	26	20	20	16
Unannounced power cuts	89	128	123	118	72	890	88	307	104	63	71	174

Source Ei

The electricity network companies are obliged to undertake risk and vulnerability analyses, as well as producing an action plan which shows the measure they will take to improve security of supply in their own network. The aim of the regulations is to decrease the vulnerability of the electricity network and contribute to fulfilling the functional requirement of the Electricity Act which states that power cuts may not last longer than 24 hours. The risk and vulnerability analyses, as well as the action plan must be submitted to Ei. Ei has drawn up directives on the annual reporting of electricity network risk and vulnerability analyses.

Aside from the functional requirements of the Electricity Act, Ei has also proscribed which other requirements must be met in order for the transmission of electricity to be considered of a satisfactory quality. The parts of the directives that relate to technical requirements for securing regional network power lines from trees and functional requirements for higher load levels were issued in the middle of 2010, while directives concerning voltage quality requirements were issued in the middle of 2011. In 2013, the directives will be complemented by guidelines for the number of power cuts at the individual customer level.

Ei has investigated the long-term power cuts which followed the winter storms of 2011/2012

According to the functional requirements of the Electricity Act, power cuts may not last longer than 24 hours. This requirement applies to events that are within the scope of the network owner's responsibility. It is the duty of Ei to investigate power cuts that last for more than 24 hours.

Between 27 November 2011 and 4 January 2012, Sweden was hit by several powerful storms. As an individual event, Cyclone Dagmar¹⁰ resulted in the most serious consequences for Sweden's electricity customers. In total there were 1.9 million power supply cuts over the course of this period. Of these, about 79,000 lasted longer than 24 hours which is the legally stipulated maximum duration of an interrupted power supply. In 2012, Ei began an investigation of the power cuts that took place during the storms and requested details of these from a large number of electricity network companies. The analysis of the investigation indicated that it was primarily local networks that were affected during the storms. The main cause for interruptions was trees that had fallen on uninsulated overhead lines. The five network companies that had the greatest number of power cuts that lasted longer than 24 hours were specifically investigated, while 13 network companies were placed under observation. Ei has stipulated that the five companies with 24 hour power cuts must produce plans indicating how they will rectify the deficiencies.

Electricity consumers have the right to compensation if the power cut lasts longer than 12 hours

According to the Electricity Act, electricity consumers who are affected by disruption to the transmission of electricity for at least 12 hours have the right to compensation from the electricity network company that the consumer is connected to. The requirement applies to power cuts that are within the scope of the network owner's responsibility.¹¹ Compensation is calculated according to a standardised formula and is paid automatically. The Electricity Act also regulates the right to damages from electricity network companies in the case of personal injury, damage to property or economic loss. Ei has drawn up directives on how a network owner will inform their customers about the regulations for power cut compensation.

Network fees

The Swedish electricity network is run as a regulated monopoly, with Ei reviewing the network companies' revenues and assessing whether they are fair. According to the Electricity Act, electricity network companies have the right to be compensated for the cost of operations and maintenance, as well as achieving a reasonable return on the enterprise's capital. The companies must improve the efficiency of their operations and maintain a satisfactory quality of supply. Details of the network fees are collected for 20 or so customer groups in order to simply compare network fees between electricity network companies.

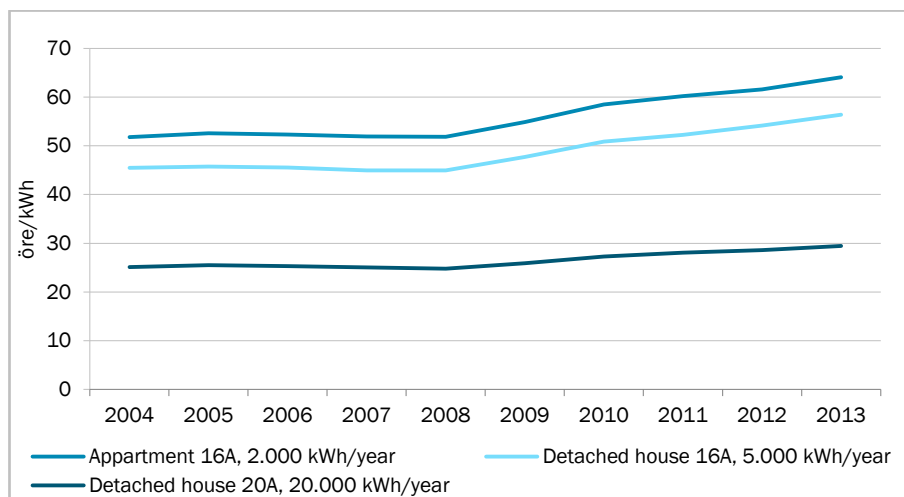
Electricity network fees often consist of a fixed portion (subscription fee) and a variable portion (electricity transmission fee). The fixed portion varies with the size of the fuse or the volume of power subscribed to. The variable portion changes in line with the customer's usage. For a detached house with electric heating, the fixed and variable portions of the charge are about the same.

¹⁰ The cyclone reached Sweden and the rest of the Nordic region during the early hours of 26 December 2011.

¹¹ Events that are encompassed by what the company can be considered to be responsible for and have control over.

Over the course of the previous ten years, the development of the network fees has varied. Between 2004 and 2008, the fees increased in line with inflation, see figure 2; subsequently, the fees have risen faster than the rate of inflation. Between 2012 and 2013, the fee rose 3.9 per cent for customers in apartments, 4 per cent for customers in detached houses with 16 Amp fuses and 2.9 per cent for customers in detached houses with 20 Amp fuses. In monetary terms this is equivalent to an increase of SEK 50, 112 and 171, respectively, per year and household.

Figure 2. Real-terms development of network fees for domestic customers¹²



Source: Ei

Customers with low electricity consumption have fewer tariff alternatives than customer with high electricity consumption. Several electricity network companies offer only one type of tariff, simple tariff, to small customers. Simple tariff means that the customer pays the same amount, regardless of what time of day the electricity is used. The alternative to simple tariff is time tariff. The customer then pays a varying amount, depending on when the electricity is used. Normally the electricity price is lower at night than during the day.

Some electricity network companies have introduced power-based tariffs for domestic customers. In these the network tariff comprises a smaller fixed charge which is linked to the size of their main fuse. The size of the fuse determines the maximum possible power consumption. An additional power charge is debited, depending on how the household uses the electricity network. The network tariff is differentiated within a specific fuse size, and various prices may be applicable, depending partly on the time of day and partly on the time of the year.

Ei's prospective determination of electricity network fees for 2012 – 2015

Ei decrees in advance how much revenue the electricity network companies may receive over the course of a four-year period.¹³ Revenues should cover the legitimate costs of running a network organisation over the course of the period, as well as providing a reasonable return on the capital invested. The quality of the way in which the network companies conduct their activities will also be taken into consideration. The standardised method, which Ei has produced, takes into

¹² Mean value, adjusted for 2013's price level, not weighted.

¹³ Since 1 January 2012, in accordance with the regulations in Chapter 5 of the Electricity Act (1997:857).

account the long-term investments the network companies need to make in order to sufficiently maintain the quality of the electricity network. In the formula that is used, the capital cost, ongoing costs and also the quality of the network activities for the regulatory period are taken into account. The aim of this regulatory model is partly so that the companies' customers will have predictable fees, partly to make it possible for the companies to invest in and maintain their networks.

The first regulatory period runs from 2012 to 2015¹⁴. The revenue frameworks for this period were determined by Ei at the end of October 2011. In this, Ei set the maximum level of revenue that Sweden's local and regional network companies may receive from their customers for network transmission during the regulatory period.

In the assessment, Ei evaluated partly legitimate cost increases, partly what was considered reasonable compensation for the capital that the Swedish electricity network constitutes. Ei decided to implement a transitional period of four regulatory periods because there appears to be a need to even out the allowable revenue increases in the short-term. As a result of this, it was decreed that network companies may, on average, increase the fees by two per cent per year, over and above the rate of inflation (real-terms increase). However, the allowable increases vary from approx. one per cent up to eight per cent.

Appeals were lodged at the Administrative Court in Linköping for about half of the decrees that were announced. The court proceedings are ongoing. Ei submitted a statement to the Court on 31 October 2012 in which Ei contested the electricity companies' motion to increase the revenue frameworks from the decreed level to the level that the companies requested. Ei did, however, concede to certain adjustments with regard to the calculation of uncontrollable costs and the calculation of capital costs for the net change in the asset base. The adjustments mean that the uncontrollable costs and the costs for net changes in the asset base will not be covered by the transition period, but will, instead, provide compensation in accordance with the standardised method. Ei's justification for changing its position is that the original revenue frameworks may be a barrier to wind-power and small-scale electricity generation being connected to the network.

Review of the network fees for 2011

Up until prospective regulation came into force, Ei reviewed the electricity network companies' fees retrospectively. The review occurred by means of an assessment of the reasonability of the companies' revenues. The earlier regulatory model applies to the network fees for 2011. Figure 3 shows the schematic picture of the review method.

Step 1 The electricity network companies separately reported the financial and technical accounts of their electricity network activities¹⁵ to Ei, and also submitted proposals and details for the determination of the revenue framework for the regulatory period 2012 - 2015. The quality of the details reported was checked and supplemented by the companies as required.

¹⁴ There are a few electricity network companies that have a one year regulatory period.

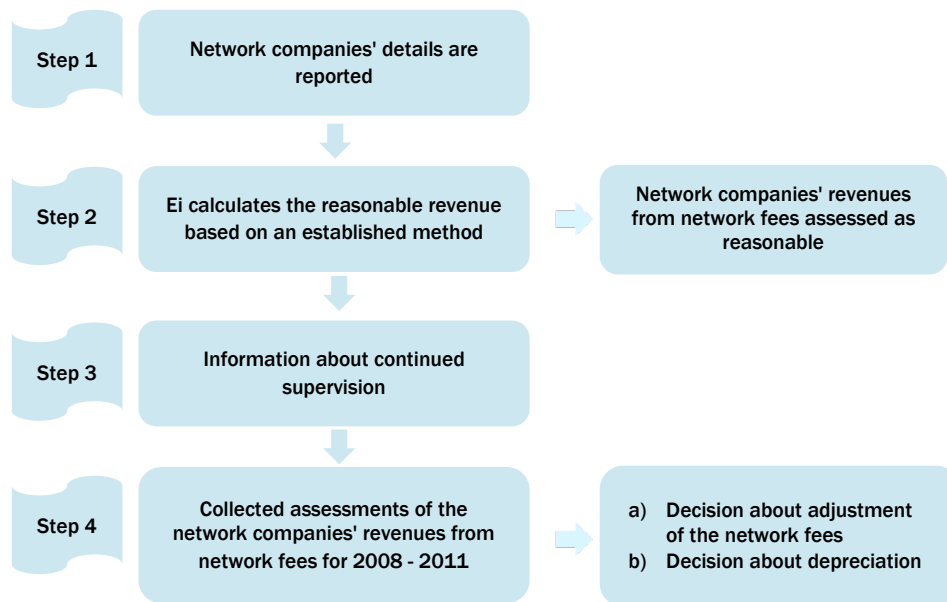
¹⁵ Reported annually, seven months after the end of the financial year.

Step 2 Based on the details that were received and checked, Ei calculated approved an revenue level for each company according to its own method. Ei then compared the approved revenue level with the revenue that each company actually obtained from its customers.

Step 3 In those cases where Ei found that the company's actual revenue for 2011 was greater than the approved level that had been calculated, Ei informed the company about continued supervision¹⁶.

Step 4 Overall assessment of the network fees for 2008 - 2011 (see below).

Figure 3. Method overview



Source: Ei

The review of the network fees for 2011 covered a total of 168 electricity network companies. Ei's assessment was that the majority of the country's electricity network companies took out a reasonable return in relation to the limitations set by Ei. In total, 28 electricity network companies were informed about continued supervision of their network fees. For three reporting units, the decision was based on an interrupted financial year, which meant that the details of their activities for 2011 had not been received by Ei by the time the review was conducted. The remaining 25 network companies had actual revenues in 2011 which exceeded the approved level according to the regulatory model.

Overall assessment of the network fees for 2008 - 2011

Ei has conducted an assessment of the revenues from network fees for each year from 2008 to 2011. The assessment method has not been the same for each of the years, but has, instead, been adjusted successively in order to bring it into line, as much as possible, with the method that had been applied to the assessment of the network companies revenue frameworks for the 2012 – 2015 regulatory period. For

¹⁶ According to Chapter 12, Section 3 a of the Electricity Act.

this reason, Ei intend to make an overall assessment of the network fees for the 2008 – 2011 period. The overall assessment aims to even out variations in the result of the reviews for each individual year.

There are currently ongoing court proceedings relating to decreed revenue frameworks for the 2012 – 2015 period that may lead to certain adjustments to how the network companies' revenue frameworks will be calculated. This may also affect the continued review of ongoing cases for the 2010 – 2011 period. As a result, Ei has decided to put off conducting an overall revenue assessment until there is clarity about how the processes will be developed.

Cross-border cooperation

Ei conducts cross-border cooperation as part of several bodies. Within the scope of NordREG (Nordic Energy Regulators), there is cooperation with the other Nordic regulatory agencies. Within the scope of the cooperation in the Northern Europe region, there is an exchange between the Nordic, German and Polish regulatory agencies. In addition there is intensive work ongoing with the so-called NWE region (North West Europe), which consists of the Northern Europe region, the CWE¹⁷ region (Central Western European) and the United Kingdom. The aim of the cooperation is to reach a single price coupling system for all European trade in electricity. Cooperation will be successively expanded until it encompasses the entire EU.

An important prerequisite for a common market is that there are common rules for the transmission of and trade in electricity in a safe and efficient way in the different Member States. Not least, it must be certain that the technology for the transmission of electricity between countries' national grids works perfectly. Ei has, in its work as part of the European Agency for the Cooperation of Energy Regulators (ACER), produced framework guidelines that are in accordance with the process that has been set out for the production of European regulations for a common European market for electricity, as well as submitted its opinion about, so-called, network codes.

Collective Nordic balancing

For over a decade, balancing¹⁸ has been conducted collectively in the Nordic area by the Nordic transmission system operators. This means that balancing is managed as if the Nordic synchronous area¹⁹ was a single control area. However, each national transmission system operator retains their responsibility. Furthermore, there is a common market for regulatory power in which the most efficient resources in the Nordic region are used for up or down regulation.

The common principals for the settlement of balancing services was introduced in 2009. There is work currently taking place in order to facilitate the collective settlement of balancing services in the Nordic region as one route to a common consumer market. Preparations are also underway among the transmission system

¹⁷ Germany, France, the Netherlands, Luxembourg and Belgium.

¹⁸ Balancing takes place in order to correct frequency deviations, i.e. restore the momentary balance, in the power system.

¹⁹ Electricity system, the constituent parts of which are connected together with alternating current interconnections and which thus have a common frequency.

operators for a common market for automatic reserves in order to maintain the system frequency. The Nordic regulatory agencies are following the changes that are taking place and are adopting a common position on whether changes should be implemented. National decisions are taken thereafter. Ei normally adopt a position on changes by approving changes in the general balancing contract between SvK and the companies with responsibility for balancing.

Work took place within ACER between 2011 and 2012 to produce new framework guidelines for a common European balancing market. Ei contributed to this work. These framework guidelines form the foundations of the, so-called, network codes that are produced by the European Network of Transmission System Operators for Electricity (ENTSO-E). The work on these began in 2013. With that in mind, a number of pilot projects are being conducted within ENTSO-E concerning cross-border balancing.

For several years, the Nordic transmission system operators have collectively managed overloads using implicit auctions on the Nordic electricity exchange Nord Pool Spot. The methods used to calculate the capacity that is available to be placed on the market through such implicit auctions, as well as the methods used to announce the auctions will be public. Changes in these methods must be approved by the regulator. Within the framework of the Nordic cooperation in NordREG, discussions are ongoing into whether the current methods used to calculate capacity are satisfactory or if changes should take place.

Continued efforts to increased European harmonisation

According to the EU's electricity market directives, the regulatory agencies have a duty to supervise how the access to cross-border infrastructure is managed by the transmission system operators. This duty is part of the responsibility Ei has in its role as a regulator. The common Nordic market is well-established which means that it is, primarily, changes that require the attention of the regulators. Ei actively works with the other Nordic regulators to ensure that internal rules and practices in the Nordic countries are developed in line with the goal of increased harmonisation.

According to the Electricity Act, network tariffs for transmission of electricity are structured so that the payment of a connection charge grants the right to use the electricity network within the country. The government may, however, also dictate that the payment of a connection charge grants the right to use international interconnections to one or more countries. Such decision have previously been taken by the government for interconnections between Sweden and the other Nordic countries, as well as, with effect from 2012, for interconnections between Sweden and Poland and Germany, respectively.

The allocation of each of the interconnections take place through implicit auctions via Nord Pool Spot or EMCC (European Market Coupling Company). Through EMCC, the Nordic market is also connected to France, Luxembourg, the Netherlands and Belgium. Because all available transmission capacity is allocated in this way, there are no specific auctions for explicit allocation of capacity. However, together with the other regulators concerned, Ei investigates the whether there is a requirement for and the preconditions to introduce financial

transmission rights as an instrument for hedging the price differences between different price areas in the interconnected electricity market. In the Nordic internal market, the Nordic regulators have, within the scope of NordREG, come to the conclusion that such instruments would not provide the market with any significant benefit and they should, therefore, not be introduced.

Extensive development is currently taking place within the framework of the European work to create a European internal market for electricity. A pilot project for linking the prices of each of the markets concerned is being conducted between the Nordic countries, Germany, France, Luxembourg, the Netherlands, Belgium, and the United Kingdom. This interconnection could be expanded to include all European countries. The work, which is being conducted by the transmission system operators and the relevant electricity exchanges, is supervised by the national regulators under the leadership of the German and Danish regulators. Ei is actively contributing to this work. An important part of the work is to ensure that the changes which impact the Swedish and Nordic players are consistent with a well-functioning market in the Nordic region.

Ei's work with regard to national and European electricity legislation

Ei's duties, according to the Electricity Act, as the network authority include exercising supervision to ensure that companies comply with the electricity legislation. It states in the Act²⁰ that Ei is also the regulator in accordance with the regulation²¹ governing the terms for access to the network for cross-border trade in electricity. Ei is directed by the government to fulfil the duties within its area that result from the EU's electricity market directive.

According to the electricity market directive²², the national regulators will follow and implement the legally binding and relevant decisions taken by ACER and the European Commission. No specific legislation is required in order for this to apply in Sweden because the provision has an advisory character. In order to make it possible for Ei to follow the Commission's decisions, provisions have been introduced into the Electricity Act²³ and in the Act (2011:710)²⁴ on the Certification of Transmission System Operators for Electricity. These provisions mean that Ei, in decisions which are affected by such guidelines as are referred to in the electricity market directive²⁵, must specify that the decision may be altered or annulled at the request of the European Commission.

²⁰ According to Chapter 12, Section 1, Paragraph 4.

²¹ (EC) No 714/2009.

²² Article 37.1 d.

²³ Chapter 12, Section 1b.

²⁴ Chapter 3, Section 4 and Chapter 4, Section 3.

²⁵ Article 39.

According to the Electricity Act²⁶, Ei has the right to, upon request, obtain the information and access the documents that are required in its role as the regulator. Ei may²⁷ issue such enforcement orders as are required in order to ensure compliance with the regulations and provisions that are covered by its role as regulator. An enforcement order may be associated with a fine.²⁸

²⁶ Chapter 12, Section 2 of the Electricity Act.

²⁷ According to Chapter 12, Section 3 of the Electricity Act.

²⁸ There is nothing to prevent such a fine reaching up to ten per cent of a company's turnover.

The Wholesale Energy Market

The Swedish wholesale energy market is one part of an integrated Nordic market thanks to transmission interconnections with Norway, Denmark and Finland. The Nordic grid is, in turn, interconnected with the European electricity network. The operational management of the electricity network takes place within each individual country, where the transmission system operator is responsible for constantly balancing the national grid.

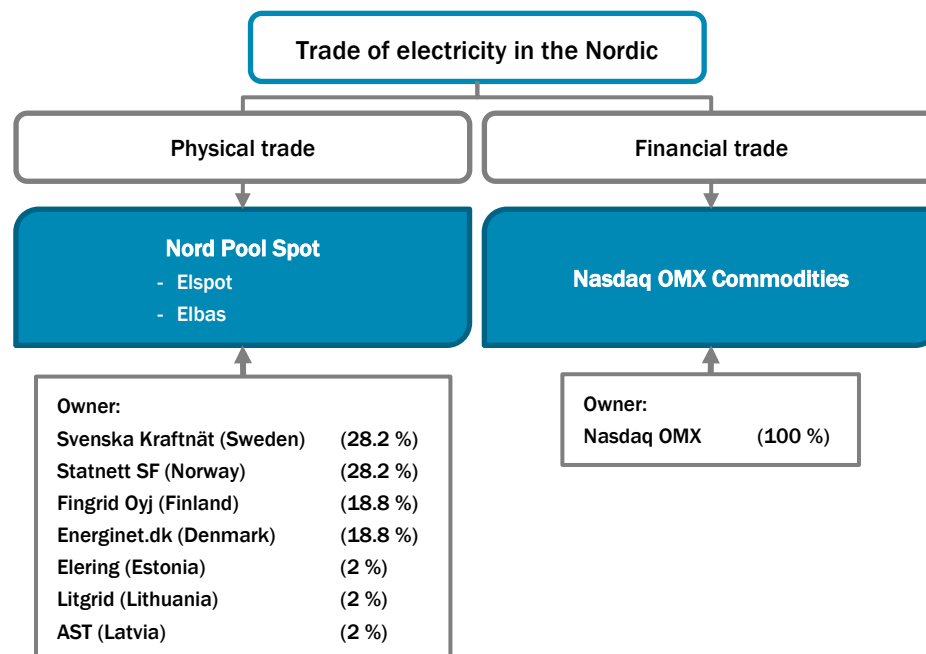
The electricity produced in Sweden mainly comes from nuclear and hydro-electric power stations. Electricity consumption is affected by a relatively high proportion of electricity-intensive industry and by the fact that many households have electrical heating. A large proportion of the trade in electricity between producers and buyers in Sweden takes place on the Nordic electricity exchange Nord Pool Spot.

Increased electricity trade in the Nordic region

Trade on Nord Pool Spot is organised using contracts for the physical delivery of electricity. On Elspot, the system price²⁹ and spot prices are set 24hrs in advance for each hour of the following day. Elbas is the physical adjustment market on which trade can take place up until one hour before delivery, 24hrs a day.

Financial trading in the Nordic electricity market takes place on Nasdaq OMX Commodities. Long-term contracts and hedging opportunities are available there for days, weeks, months, quarters and years. Carbon emissions permits are also traded on Nasdaq OMX. The structure and ownership of Nordic trade is shown in figure 4.

Figure 4. Marketplaces for electricity in the Nordic market³⁰



Almost all the electricity that is produced in Sweden, 90.8 per cent, is sold on Nord Pool Spot. Nord Pool Spot's market share of the total electricity consumption in the

²⁹ The system price is an equilibrium price, based on all the bids and offers in the entire Nord Pool Spot area.

³⁰ Lithuania was due to become an owner on 3 June 2013.

Nordic region is about 77 per cent. Only a small proportion of the electricity produced is sold through, so-called, OTC contracts³¹, i.e. bilateral contracts. The total volume traded at Nord Pool Spot increased by 40 TWh, compared to the previous year, and was 338.2 TWh for 2012 (334 TWh on Elspot and 3.2 TWh on Elbas). In total, the number of members of Nord Pool Spot amounted to 358 on Elspot and 121 on Elbas.

On the financial markets, the total turnover was down, compared with 2011, and amounted to 1,663 TWh in 2012. The number of members of Nasdaq OMX Commodities amounted to 331 in 2012; 20 fewer than the previous year.

Record production contributed to low spot prices

As normal³², there was a great variation in prices throughout the year, with higher prices in the winter and lower prices in the summer. The price was particularly high at the beginning of February and in the middle of December 2012, when it was cold and there was high electricity consumption. From the middle of July until the beginning of August, prices were comparatively low. The prices were then below 10 öre per kWh for over 20 days, see figure 5. The low prices can be explained by the high level of hydro-electric production, combined with low consumption.

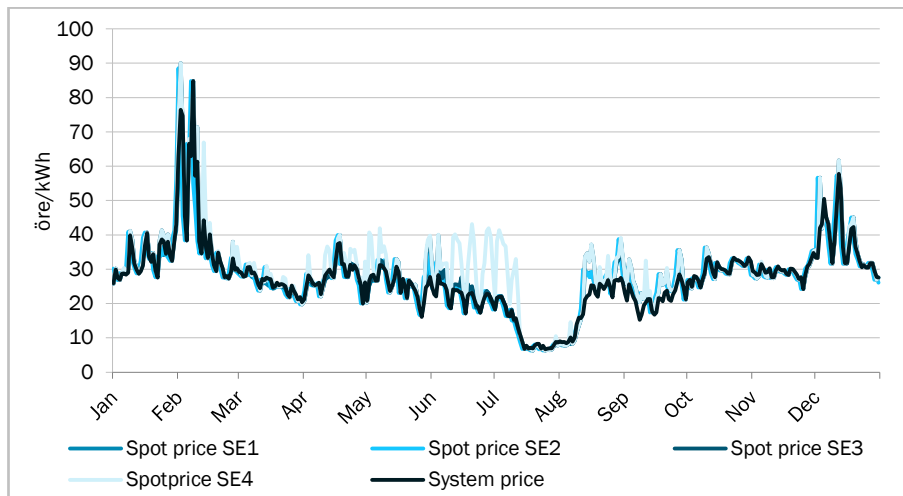
The average system price in 2012 was 27.2 öre per kWh which is roughly a third lower than 2011 (42.3 öre per kWh). For the first time since 2007, the average price for the year was below 30 öre per kWh. The lower price was due to the high level of production from hydro-electric power stations in Sweden, combined with a great deal of precipitation and normal temperatures. Depressed consumption and continued expansion of wind-power capacity also contributed.

At its peak in February, the daily average for the system price was 84.8 öre per kWh, and at its lowest at the end of July it was about 6.7 öre per kWh. In Sweden the price was, on average, 27.7 öre per kWh in bidding areas 1 and 2. Bidding area 3 had an average price of 28.2 öre per kWh, and in the southern bidding area, SE4, the price was 29.8 for the year.

³¹ Over-the-counter.

³² The price development on Nord Pool Spot is explained, to a large extent, by basic factors such as variations in precipitation, wind and temperature.

Figure 5. Price development 2012, daily average in öre per kWh



Source: Nord Pool Spot

Proportion of the time with common pricing

The requirement to transmit electricity within Sweden and the Nordic region is primarily affected by variation in the availability of hydro-electricity, as well as seasonal variations in consumption. At the same time, there are limitations in the transmission capacity of the Nordic grid that can lead to congestion. Congestion in the Swedish national grid is normally associated with a high level of hydro-electric production in the north, leading to a large requirement for transmission in a southerly direction. Congestion also occurs in situations where there is a large amount of transmission in a northerly direction from Denmark and the continent to the Swedish west coast and onward to southern Norway.

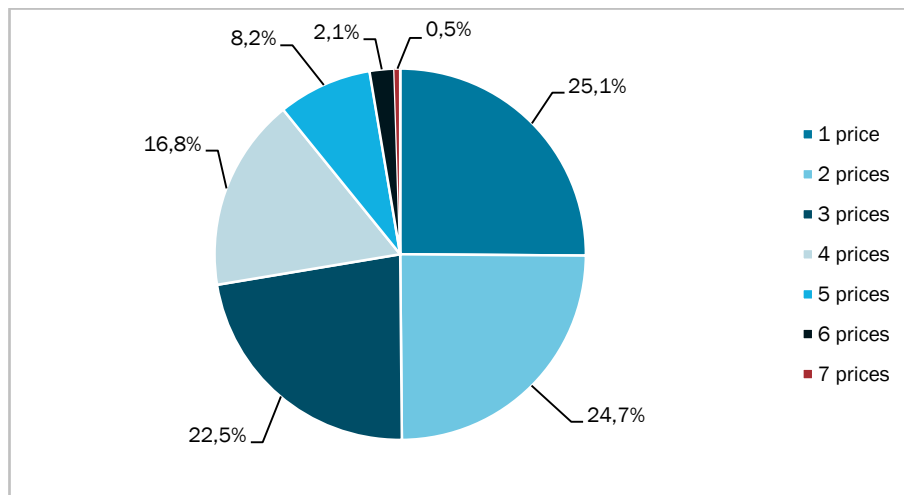
According to the EU's regulations, market-based methods should be used to manage congestion. In the Nordic region it is counter-trading and market splitting that are primarily used. Counter-trading involves SvK ordering an increase in the production of electricity in the area which has a deficit and/or reduced production in the area with a surplus. These costs, so-called, counter-trading costs, are a burden on SvK and thus provide a signal that the grid needs to be reinforced.

Market splitting involves the electricity market being temporarily split into sub-markets with different electricity prices adapted to the transmission capacity between the sub-markets. In periods when the transmission capacity is not sufficient to satisfy the market's transmission requirements, smaller sub-markets appear in the Nordic electricity market. As a result of the limitations to transmission in the Nordic region, the Nordic electricity market is divided into bidding areas, also called spot price areas or bidding areas. Prices are determined by production and consumption within the respective area, as well as the capacity to transmit power to and from that area.

The most common bidding areas on Nord Pool Spot is Luleå (SE1), Sundsvall (SE2), Stockholm (SE3), Malmö (SE4), Finland, Western Denmark (DK1), Eastern Denmark (DK2), Northern Norway, Central Norway and Southern Norway. Norway may be divided into additional price areas during periods of extensive

congestion. In 2012, the whole of the Nordic region³³ had a common electricity price for 25 per cent of the time (see figure 6). This is an increase of almost 8 percentage points in relation to 2010, when the electricity price was the same 18 per cent of the time. The cause of the increase was a normalised hydrological balance, somewhat greater availability of nuclear power and a depressed Nordic demand for electricity.

Figure 6. Proportion of the time with common pricing in the Nordic region 2012

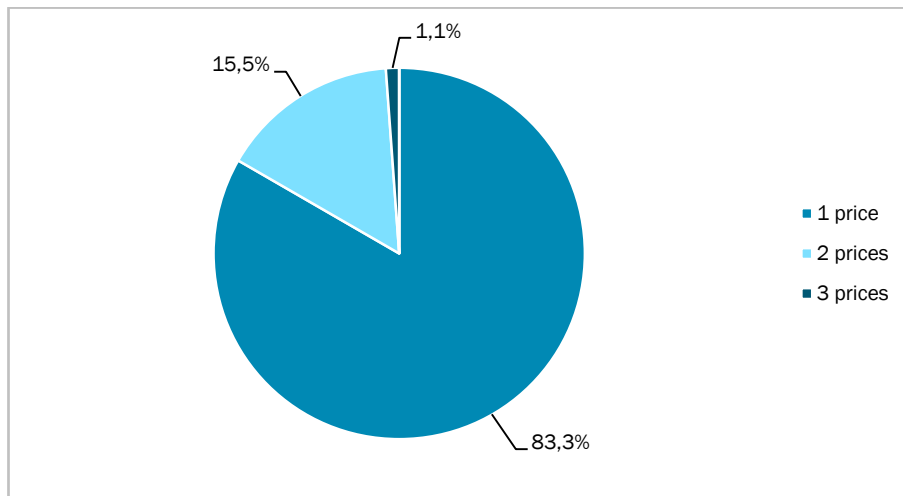


Source: Nord Pool Spot, adapted by Ei

Sweden has been divided into four bidding areas since November 2011. When the bidding areas were introduced, there was concern that the prices would be considerably higher in bidding area 4 (Malmö). At the end of May 2012, Ei published a report that provided details of the first five months following the division. Ei's study showed that it is extremely unusual for the Swedish bidding areas to be completely isolated and constitute individual pricing areas. Furthermore, it is indicated that the division into bidding areas had involved an improvement to competitive conditions at the times when the bidding areas are connected to neighbouring countries. In 2012, Sweden had a common price during 83 per cent of the time, which is shown in figure 7. Bidding area 1 (Luleå) and bidding area 2 (Sundsvall) had the same price 98 per cent of the time, while bidding area 4 was isolated from all the other Swedish bidding areas 11 per cent of the time. Sweden had three different prices for only 1.1 per cent of the time. Price differences appear when the limitations to transmission combine with periods of high load, cold winter weather, spring floods or limited availability of nuclear power capacity, which is an important source of supply for the south of Sweden.

³³ Norway (1-5), Sweden (1-4), Finland and Denmark (1-2).

Figure 7. Proportion of the time with common pricing in the Sweden 2012



Source: Nord Pool Spot, adapted by Ei

Record production and high levels of exports during the year

In 2012, Sweden produced more electricity than ever before. Total electricity production amounted to 162 TWh, which represented an increase of about 10 per cent, compared to 2011. Table 2 shows Sweden's electricity balance for the years 2005 - 2012. Hydro-electric production was responsible for the greatest proportion of the increase, 18.1 per cent, which is equivalent to an increase of 12 TWh. The increase in production was caused by 2012 being a more favourable year in terms of precipitation and water in the reservoirs than 2011. Nuclear production increased by 3.4 TWh (5.8 per cent). After hydro, wind-power had the second largest percentage increase, 18 per cent, which corresponds to an increase in production of 1.1 TWh. At the same time, electricity production from combined heat and power stations continued to decrease and went down by a little more than 7.5 per cent (1.3 TWh), compared to the previous year.

Table 2. Sweden's electricity balance 2005 - 2012, TWh³⁴

	2005	2006	2007	2008	2009	2010	2011	2012 ³⁵
Domestic production	155	140.3	145	146	133.7	144.9	146.9	162.0
Hydro-electric	72	61.1	65.5	68.4	65.3	66.8	66.0	78.0
Nuclear	69.8	65	64.3	61.3	50	55.6	58.0	61.4
Other thermal	12.3	13.3	13.8	14.3	15.9	19.1	16.8	15.5
Wind	0.9	1	1.4	2	2.5	3.5	6.1	7.2
Domestic consumption	147.6	146.3	146.3	144.1	138.3	147.1	139.7	142.4
Network losses	12.4	11	11.9	11	10.2	11	10.2	11.0
Imports	14.6	20.5	18.5	15.6	16.4	17.6	14.8	13.1
Exports	-22	-14.4	-17.2	-17.6	-11.7	-15.6	-22	-32.7
Net imports	-7.4	6.1	1.3	-2	4.7	2	-7.2	-19.6

Source: Statistics Sweden and Swedish Energy

Of all the electricity produced, a total of 142.2 TWh were consumed in Sweden. This represents an increase of about two per cent in electricity consumption, compared with 2011. Homes and services were responsible for a little over 71 TWh, which is equivalent to about half of the total consumption. Mineral extraction and manufacturing consumed 52 TWh, about 37 per cent. (52 TWh). Utilities³⁶ consumed 4.3 TWh (3 per cent) and the transport sector³⁷ consumed 3 TWh (2 per cent). The remaining electricity was accounted for by losses³⁸.

The Swedish grid has interconnections with Norway, Finland, Denmark, Germany and Poland. Sweden exported 32.7 TWh and imported 13.1 TWh of electricity in 2012, which resulted in net exports of 19.6 TWh on an annual basis. This was more than double the previous year's net exports of 7.2 TWh. This part of the Swedish electricity balance was also a record. The previous highest net outflow of electricity from Sweden was 10 TWh. The main reason for the increase in exports is higher water levels in the Swedish reservoirs, as well as greater availability of Swedish nuclear power.

No change to the market shares of the largest producers

The largest electricity producers share of total electricity production has been relatively constant over the past four years. The five largest Swedish electricity producers accounted for a little more than 85 per cent of total domestic electricity production in 2012 (see figure 8). Together, Vattenfall, Fortum and E.ON were responsible for 79 per cent of total electricity production in Sweden.

³⁴ Negative values indicate exports.

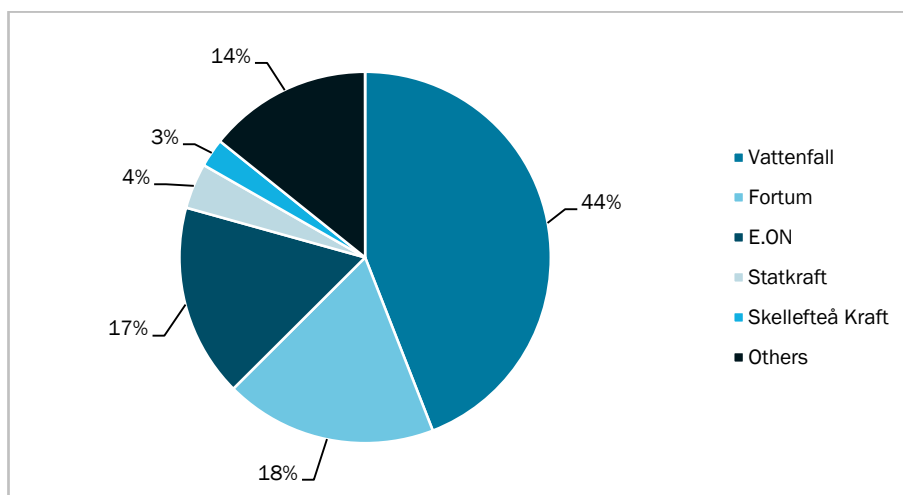
³⁵ Preliminary data from Swedish Energy.

³⁶ Power stations, gasworks, thermal power stations, waterworks.

³⁷ Railways, trams, buses.

³⁸ For example, grid losses.

Figure 8. The largest electricity producers in Sweden 2012³⁹



Source: Swedish Energy

The trend of increasing foreign ownership has been broken and the proportion has decreased in 2012. In total, 39.1 per cent of the installed capacity in Sweden is foreign owned. The Swedish State, as owner of Vattenfall, owned a total of 38.6 per cent of the total installed capacity, which was also a reduction. Swedish municipalities together own 12.3 per cent of the capacity.

Several agencies supervise the electricity markets

Several agencies and public bodies collaborate in the supervision of the Swedish and Nordic electricity market with the aim of creating, using various measures, a well-functioning electricity market and preventing the exercising of market power.

Ei is responsible for the regulation and supervision of the Swedish electricity market and the implementation of the Electricity Act. These duties result from Ei's role as the network authority in accordance with the Electricity Act and the supervision that this authority shall exercise⁴⁰. Ei continuously monitors and analyses the development of the electricity markets and submits proposals for changes to regulations or other measures that may improve how the markets function. Ei is also charged with the role of working to promote effective competition in the electricity market.

The Swedish Competition Authority (*Konkurrensverket*, KKV) is the authority which ensures that companies in the Swedish electricity market do not violate any of the prohibitions against anti-competitive behaviours in the Competition Act and the EU treaty. The Swedish Financial Supervisory Authority (*Finansinspektionen*) regulates Swedish players who act, with the authority's permission, in the financial electricity market. Supervision takes place of trade and the actions of businesses on the exchanges Nord Pool Spot and Nasdaq OMX Commodities. Nord Pool Spot, which is based in Norway, is supervised by the Norwegian Water Resources and

³⁹ Vattenfall is owned by the state. E.ON is a privately owned energy company. Fortum is 60 per cent owned by the Finnish State. Statkraft is a state-owned Norwegian company. Skellefteå Kraft is a wholly-owned municipal company.

⁴⁰ According to Chapter 12, Section 1, Paragraph 2 of the Electricity Act.

Energy Directorate (*Norges vassdrags- og energidirektorat*, NVE) and the Financial Supervision Authority of Norway (*Finanstilsynet*).

KKV's area of responsibility and activity in the electricity market

KKV is the authority that ensures that companies in the Swedish electricity market do not violate the competition regulations that are set out in the Competition Act⁴¹ and the Treaty on the Functioning of the European Union (TFEU)⁴². The Competition Act also includes rules that mean the State, a municipality or a county council, or legal persons which these have a dominant influence over, may be banned from using certain practices in sales activities.⁴³ KKV may, on its own initiative or following reports from companies and the general public, take action against anti-competitive cooperation between companies, companies that misuse their dominant position and against public bodies that violate the regulations on anti-competitive sales activities in the public sector. The Competition Act also includes rules governing mergers and acquisitions. KKV also proposes changes to regulations and other measures which aim to eliminate existing barriers to competition.

Measures to minimise the risk of joint ownership of nuclear power

KKV has, in various contexts, highlighted the general risks of joint ownership of resources for the production of electricity. The danger of there being negative effects of joint ownership are especially great in the Swedish nuclear power industry; a result, primarily, of the fact that the three leading companies jointly own the production facilities. Joint ownership mainly involves the risk of information being exchanged inappropriately between the competing companies, reducing the general confidence in the existence of a functioning market.

The government have attempted, without success, to negotiate limitations in the joint ownership of nuclear power production facilities and is thus of the opinion, as is KKV, that there remains confidence issues and risks relating to joint ownership. The ambition should, therefore, continue to be that of breaking up the joint ownership of nuclear power companies. Following a proposal from Ei, the owners of the nuclear power stations have also adopted industry-wide ethical rules on the exchange of information between companies. Moreover, independent observers have positions on the nuclear power companies' boards, with the specific duty of supervising the application of the industry's ethical rules. Ei has nominated the observers and, each year, publishes reports from each of the companies that include any comments from the observers. An observer highlighted, in the 2012 report, that it was inappropriate for one person to be the chairman of the board of one nuclear power company while concurrently the deputy chair of the board of another. This person subsequently resigned from the post of deputy chairman.

Nord Pool Spot's regulations and market supervision

All of the members of Nord Pool Spot and Nasdaq OMX Commodities must follow the electricity exchanges' regulations concerning to the management of information that can have an impact on prices. Nord Pool Spot's regulations include provisions

⁴¹ The Competition Act (2008:579), Chapter 2, Article 1 (anti-competitive cooperation) and Article 7 (abuse of dominant position).

⁴² Articles 101 and 102 in the Treaty of Lisbon.

⁴³ The Competition Act (2008:579), Chapter 3, Articles 27-32.

relating to bidding on the spot market. In accordance with Nord Pool Spot's trading licence, it has a specific duty to supervise the market, continually monitoring trade, with the aim of creating trust in the price formulation. As a result, all transactions are monitored to ensure that the members have submitted the information they are obliged to submit in order to prevent insider trading, price manipulation or the exercising of market power. As soon as is possible, the members are also obliged to provide Nord Pool Spot with all of the information that it deems relevant to its ability to supervise trade. For example, the following information about production, consumption, transmission within or in direct connection to the Nordic electricity price areas:

- Planned maintenance or bottlenecks within the following six weeks that affect over 100 MW.
- Planned maintenance or bottlenecks that affect over 400 MW of infrastructure for production, consumption or transmission over the course of the current year or the subsequent three years.
- Unplanned stops and breakdowns over 100 MW which affect the capacity for production, consumption or transmission.

If a violation of the regulations is identified, there is a system of sanctions that includes such measures as warnings, fines and the revocation of permission to trade. On 22 May 2013, Nord Pool Spot launched a new, sophisticated UMM system which aims to make the flow of information more efficient.

New regulation for coherent supervision

In 2011 the new regulation on wholesale energy market integrity and transparency (REMIT)⁴⁴ came into force, which facilitates coherent supervision of the increasingly integrated European electricity and gas markets. The responsibility of Ei and its continuous work to supervise the Swedish markets has thus increased; Ei has also created a new department to accomplish this duty. In 2012, Ei's cooperation with ACER⁴⁵ and the regulatory authorities of other countries to work out the details of the regulations for implementation and application of REMIT was accredited.

The subsequent timescale for implementation is dependent on when the European Commission decide on the proposals for detailed regulation that have been worked out. The decision is expected at the end of 2013, which means that the continual supervision in line with REMIT is expected to begin in 2014.

During the winter of 2013 - 2014, the registration of market members will begin, and they will begin reporting their wholesale energy product transactions, in accordance with the regulation, around the middle of 2014.

⁴⁴ The full title of the regulation is: Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency.

⁴⁵ The EU agency that encourages cooperation among European energy regulators.

Consumer market

The Swedish consumer market for electricity has been exposed to competition since 1996. There is no regulation of prices. There are about 5.2 million electricity customers in Sweden. Of these, about 87 per cent are domestic consumers.

In recent years, the number of electricity suppliers has remained more or less unchanged. At the end of 2012 there were 121 electricity suppliers, of which 97 per cent sold electricity throughout the country. More than half of all electricity suppliers are companies that are part of businesses that also generate electricity.

Work on a Nordic consumer market

The Swedish consumer electricity market is, at the moment, national. For many years, however, there has been the political will to create a common Nordic consumer electricity market. The aim of a Nordic consumer market is to make it easier for electricity supplier to be active in several countries, and thus promote competition. The model should also make things simpler for electricity customers and reinforce competition by making the electricity supplier the central point of contact for the electricity customer.

In the creation of a common market, the design of market regulations are a central issue. In order to achieve a common consumer market, it is important that the design of the market is, on the whole, harmonised to minimise the barriers to being involved in several Nordic countries at the same time which take the form of adaptation costs and increased transaction costs. The Nordic regulators in the cooperative body NordREG (Nordic Energy Regulators) published recommendations⁴⁶ in 2011 on the future market model for a common Nordic consumer market. The chosen market model, which is usually called the "supplier centric model", is expected to come into force in 2015.

Currently, NordREG's work is directed at producing Nordic recommendations about which processes it is most critical to harmonise in order to achieve a common Nordic consumer market. In the fall of 2012, Ei was commissioned by the government to produce a proposal about the changes that are required to Swedish law in order to create the conditions for a Nordic consumer market. A report on this work was submitted to the department in the middle of June 2013.⁴⁷ In this report, Ei proposed, for example, that the electricity suppliers become the customer's primary point of contact when changing supplier or moving as well as for billing. The proposal also involves mandatory combined billing.

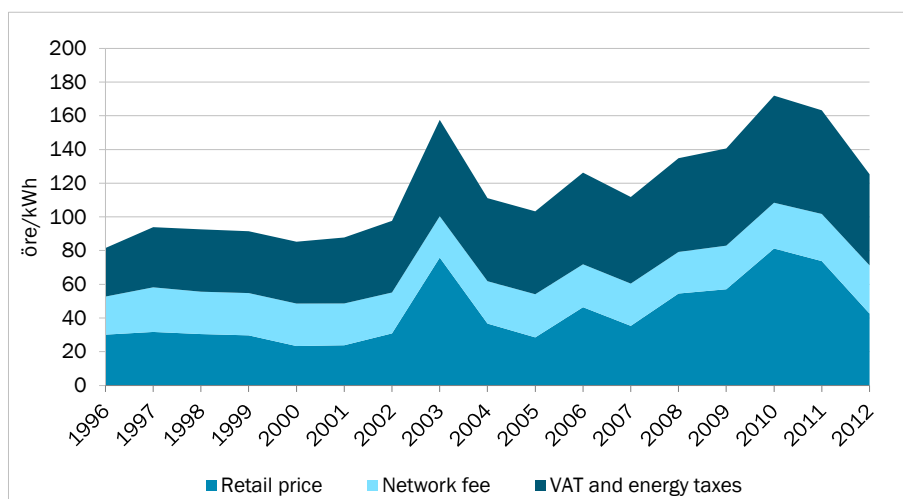
Lower electricity cost in 2012

The total cost of electricity for a detached house with electrical heating amounted to, on average, 118,7 öre per kWh in 2012, which is equivalent to about SEK 23,700 per year. This was SEK 3,600 less than the previous year. figure 9 shows the development of the total electricity cost, as of the first of January, between the years 1997 and 2013. The cost of the electricity supplied is the part of the total electricity cost which has varied most in recent years.

⁴⁶ Rights and obligations of DSO's and suppliers in the customer interface (NordREG report 4/2011).

⁴⁷ EiR2013:09. Simplified for the customer – proposal to improve the conditions for a Nordic consumer market.

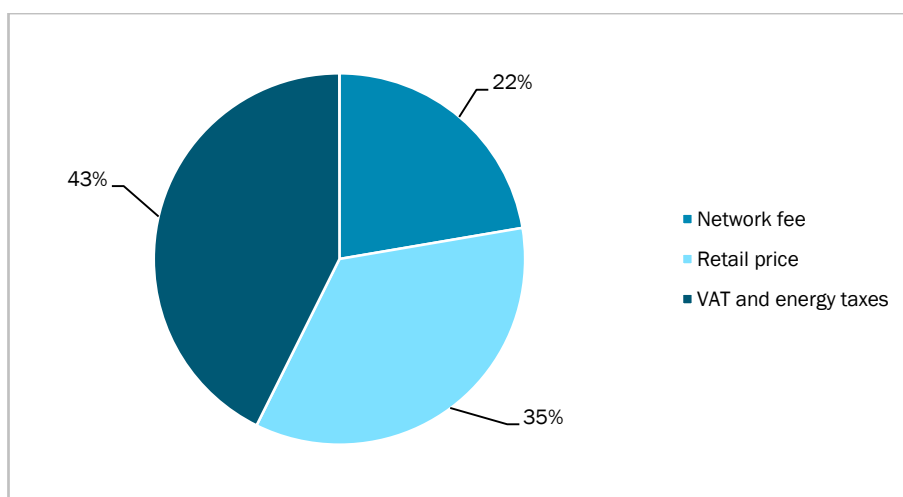
Figure 9. Real-terms changes in the total cost of electricity for domestic customers in houses with electrical heating⁴⁸



Source: Ei

The electricity supply price (including the cost for green certificates) constituted 35 per cent of the total cost of electricity in January 2013. This is shown in figure 10. This may be compared with the year before, when the proportion was 34 per cent. The cost of electricity transmission, the network fee, accounted for 22 per cent (previously 23 per cent), while energy tax and VAT together made up 43 per cent (the same as the previous year). Since 2011, the proportion which is made up of both the network fee and the energy tax has risen. This is not because these costs have increased appreciable, but that the cost of the electricity supplied has decreased. This has led to the proportions becoming closer to one another.

Figure 10. Total electricity cost for a domestic customer in a house with electrical heating as of the first of January 2012⁴⁹



Source: Ei and SCB

⁴⁸ Fuse size 20 A with a consumption of 20,000 kWh per year. The electricity supply price up until 2008 is based on a variable contract as of the first of January of each year, using data from Statistics Sweden (SCB). From 2009, the variable price for January has been obtained from monthly data from Elpriskollen. The mean value is adjusted for 2013's price level, not weighted.

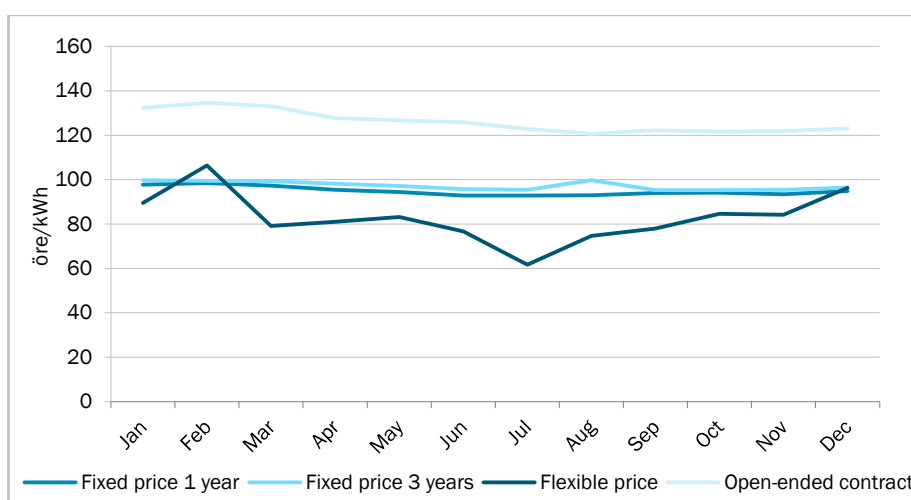
⁴⁹ Fuse size 20 A with a consumption of 20,000 kWh per year.

The electricity supply price has continued to decrease

Figure 11 shows the development of the electricity supply price under the commonest types of contract for domestic customers with an annual consumption of 20,000 kWh. In 2012, the customers who had a contract with a variable price generally had a lower electricity cost than customers with a fixed price.

In 2012, the default prices (the price from the default supplier if no alternative supplier or contract is selected) were about 40 öre per kWh higher than the variable prices. The annual cost for a customer in an apartment with a default contract was on average SEK 900 higher than for a customer with a variable price contract. For a customer in a detached house with electrical heating (20,000 kWh per year) the equivalent difference was slightly more than SEK 8,600.

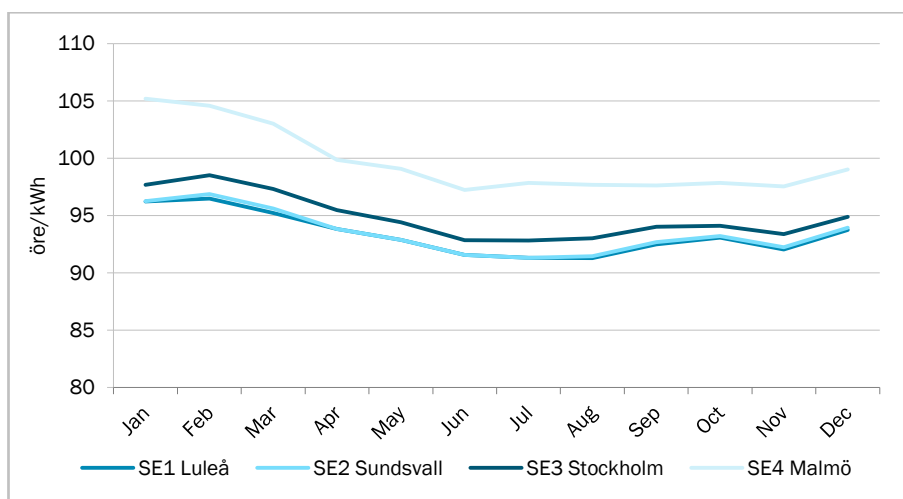
Figure 11. Development of the electricity supply price for the most common types of contract in 2012



Source: Ei

In general, the prices decreased compared to the previous year. Figure 12 shows the price development for domestic customers with a price that is fixed for one year in each of Sweden's bidding areas. The price in bidding area 4 (Malmö) was an average of 6 öre per kWh higher than in the northern bidding areas (1 and 2). The difference between bidding areas 3 and 4 was somewhat lower, just under 5 öre per kWh on average.

Figure 12. Development of the electricity supply price for 1 year fixed price contracts in each of the bidding areas in 2012



Source: Ei

More customers with variable price contracts

The proportion of customers with variable price contracts increased by 17 per cent from the previous year. In December 2012, 32 per cent of customers had a variable price contract, compared with nearly 27.5 per cent at the same point in 2011 (see figure 13).

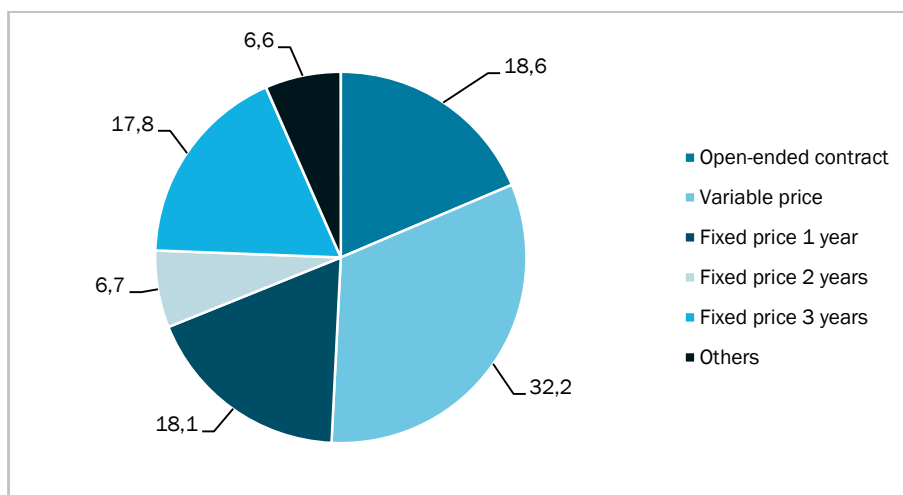
At the same time, there was a reduction in the number of electricity customers in Sweden with a default price contract. In December 2012, just over 18 per cent of all customers had a default price contract, this was a reduction of three percentage points, compared to the same point in 2011. The default price is often higher than the price of fixed or variable contracts that customers actively sign up for with electricity suppliers. In May 2012, Ei presented proposals for reducing the proportion of customers on default price contracts. One of the proposals was a tightening of the Electricity Act's requirement that the default electricity suppliers provide information to customers on default contracts to increase awareness amongst the inactive customers.

At the same time as fewer customers pay the default price, the difference between the price of a default contract and the other types of contract. The total cost was about 50 per cent higher for a customer on a default contract than for a customer on a variable price contract over the course of the year.

The majority of customers, close to 43 per cent, had a fixed price-contract.⁵⁰ This was a marginal decrease from the previous year, when the proportion of customers with a fixed price contract was 44 per cent. Three-year fixed price contracts reduced from 19.5 per cent to 17.8 per cent last year.

⁵⁰ This includes contracts lasting 1-3 years. Other fixed price contracts, such as those for 5 years, are not included.

Figure 13. Distribution of domestic customer by type of contract in December 2012



Source: SCB

Increased proportion of active customers

In total, over 1.7 million domestic customers were active in the electricity market over the course of the year, either by changing electricity supplier or negotiating a new contract. This corresponds to 37 per cent of the total number of domestic customers in the Swedish electricity market. Customer activity has increased in recent years.

It is more common for the customer to renegotiate their contract with their current electricity supplier than for them to change supplier. A total of 27.4 per cent of all domestic customers in Sweden signed up for new contracts in 2012, which was an increase of nearly two percentage points compared with 2011. The number changing electricity supplier was slightly down on the previous year. A total of 9.9 per cent⁵¹ of all domestic customers in Sweden changed electricity supplier over the course of the year (10.1 per cent the previous year).

The electricity customer has the right to demand hourly metering

On 1 October 2012 new regulations on hourly metering came into force. These regulations give all electricity customers the right to have their consumption metered by the hour. At the end of 2012, there were 40 or so electricity suppliers offering variable hourly contracts.

Hourly metering aims to increase the opportunity of the electricity consumer to change their consumption patterns by allowing them to steer their consumption towards the hours of the day at which the prices are lower. This aim also encompasses the goal of making more efficient use of the electricity system, with the consumers being incentivised to use less electricity when demand is at its greatest.

In April 2013, Ei reported, having been commissioned by the government, on the development of the electricity market over the course of the initial months following the hourly metering reform. The report indicated that about 6,300

⁵¹ Based on the figures on customer numbers from 2011.

customers had signed up for variable contracts requiring hourly metering after 1 October 2012.⁵² In total, 41 electricity suppliers offer variable contracts based on hourly metering. Of the companies that offer these contracts, most choose not to publish the price on their website; this information is obtained by the customer only once they have contacted the company's customer service team. There are few electricity suppliers offering equipment or services that facilitate smart energy consumption.

Ei's supervision through Elpriskollen

Electricity suppliers are obliged to report their contracts and prices that are applicable to electricity consumers to Elpriskollen.se⁵³. Ei's supervision intensified in 2012 in order to ensure the quality of the details that are published, as this is required in order to make an independent price comparison.

The number of visitors to Elpriskollen has remained relatively unchanged in the last two years. More use is made of the price comparison site when there is media interest in the electricity price than when this is not the case.

⁵² It is important to note that certain electricity suppliers moved their existing customers who had variable monthly contracts over to variable hourly contracts; therefore, a proportion of the 6,300 customers on hourly contracts have not actively chosen them.

⁵³ Elpriskollen has existed since 2008.

Security of supply

Security of supply in the Swedish electricity network is generally good. Manual disconnection of consumption, which is a method that SvK are permitted by the Electricity Act to use when it is not possible to achieve a balance between input and output in the electricity network, has never been necessary.

Additional operational wind turbines increased electricity production capacity

In Sweden, investments in new electricity production capacity take place based on market principles. Permission from Ei is not required prior to constructing a new electricity production facility in Sweden; however, permission in accordance with both the Swedish Environmental Code and the Planning and Building Act is required.

At the end of 2012, the total installed capacity of Sweden's power stations was 37,353 MW, which was an increase of 2.4 per cent compared to the previous year. All in all, 1,055 MW of capacity had been added, while 170 MW was lost over the course of the previous year. The additions to the installed capacity was mainly composed of wind-power (846 MW), while the losses primarily resulted from the closure of thermal power stations (125 MW).

Table 3 shows the installed capacity distributed by production technology. Of the total installed capacity, renewables constituted close to two thirds. Wind-power increased by 29 per cent from the previous year as a result of the addition of about 350 new wind turbines. At the end of 2012, there were about 2400 wind turbines in Sweden. The installed solar power capacity increased from the previous year by 50 per cent, but is still only a small proportion of the total (0.1 per cent). In total, 1,055 MW was added and 170 MW lost.

Table 3. Installed capacity of Sweden's power stations as of 31 December 2012, MW

	2010	2011	2012	
Nuclear		9,151	9,363	9,363
Fossil		5,035	4,793	4,636
Renewables		21,516	22,307	23,354
- Hydro		16,200	16,197	16,203
- Biofuel		2,860	2,870	3,036
- Wind		2,163	2,899	3,745
- Waste		293	325	346
- Solar		-	16	24
Total		35,702	36,463	37,353

Source: Swedish Energy

The Swedish Energy Agency (*Statens energimyndighet*) is responsible for producing forecasts of future energy consumption and energy provision in Sweden. The Agency is commissioned by the government to produce short-term forecasts twice per year; these examine the energy system's short-term development (three years). Long-term forecasts are produced every other year which look at the long-term development (10-25 years) of the energy system, based on control measures that

have already been decided. The forecasts encompass energy provision and energy consumption within the transport, housing, service and industrial sectors in Sweden.

The centrally purchased capacity reserve will be replaced by a market-based solution

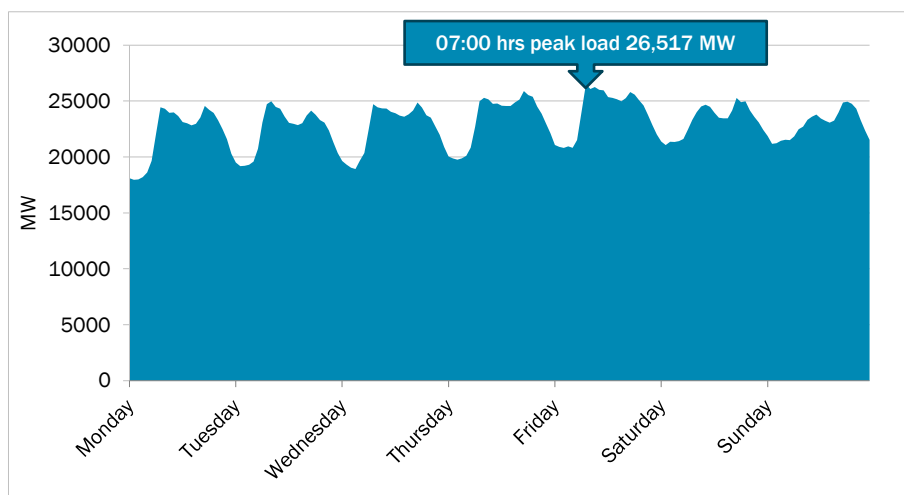
SvK is responsible for ensuring that capacity is available in reserve during the winter.⁵⁴ The capacity reserve is created by SvK entering into contracts with electricity producers and consumers to place additional production capacity or the possibility of a reduction in consumption at its disposal. The Swedish Parliament has decided that the capacity reserve will be gradually phased out until the 15 March 2020.

This decision has decreed that the issue of maintaining the capacity balance in the long-term must be solved by the market. That the state, via SvK, purchase electricity production and consumption reductions in a competitive market is judged to disrupt the functioning of the electricity market. A transition to a market based solution should, however, take place in a manageable way and not jeopardise security of supply at the same time as consumption flexibility is promoted.

A new feature in the design of Sweden's reserve capacity since the winter 2011/2012 is that contracted demand reductions are made available for trading on Nord Pool Spot. At the same time, the production portion of the capacity reserve is being reduced as one pathway in the transition to a capacity reserve completely based on reductions in consumption. The capacity reserve was 1,726 MW during the winter of 2011/2012, and 1,719 MW during the winter of 2012/2013.

The greatest electricity consumption per hour in 2012 occurred on Friday morning of 3 February at 07:00 (see figure 14).

Figure 14. Greatest electricity consumption per hour 2012



Source: Nord Pool Spot

⁵⁴ According to the Act (2003:436) on capacity reserve.

Consumption at that time was 26,517 MW. SvK's forecast for the winter of 2011/2012 expected consumption was expected to be 26,500 MW in the case of a normal winter and 28,100 MW in the case of a once in every ten years winter. The forecast consumption was somewhat lower for the winter of 2012/2013, with the greatest consumption expected to be

26,000 MW in the case of a normal winter and 27,500 MW in the case of a very cold winter. The greatest ever consumption of electricity in Sweden was 27,000 MW on 5 February 2001.

Plans for extensive reinforcement of the Swedish national grid

The Swedish national grid faces a period of very extensive expansion in the years ahead. Reinforcements are required in order to deal with new electricity production, further integrate the market with the surrounding world and contribute to the creation of a common European electricity market. At the same time, there is a significant requirement for reinvestment. Every year, SvK submits a three-year investment and funding plan to the government. SvK also publishes its outlook, which includes longer-term plans for the development of the Swedish national grid. The outlook describes SvK's challenges and priorities for the 10 to 15 years ahead.

There are several projects underway to increase the capacity and the operational reliability of the Nordic power system. One of the larger projects is the South West Link (*SydVästlänken*). The aim of this project is reduce the existing limitations to transmission capacity between the Mälaren Valley region to southern Sweden. The South West Link is being built in two part which join up close to Jönköping. From the junction, one link heads south to Skåne, while the other heads north to Hallsberg. Previously, a link heading west to Norway had been included. In April 2013, SvK decided, together with the Norwegian transmission system operator Statnett, not to continue with that part of the project because new calculations showed that its potential benefit had significantly reduced compared to the original analysis. The entire South West Link is expected to be in operation 2015/2016.

Another large project is SvK's construction of NordBalt, which is a direct current interconnection between Sweden and Lithuania. The new interconnection is one part of the interconnection of the three Baltic states' electricity networks with that of the Nordic countries, and is also important for ensuring security of supply in the Baltic states. Today, one cable between Estonia and Finland is the only interconnection between the Baltic states and the Nordic countries. A completed cable is estimated to be ready in 2015/2016.

Aside from the South West Link and NordBalt, a range of other projects is ongoing in order to reinforce the electricity networks in the regions surrounding Sweden's major cities, as well as reinforcement of the intersections between bidding areas. New cables to nuclear power stations and connections to wind farms are also included in the plan. In addition, SvK is planning a national grid interconnection between Gotland and the Swedish mainland.

The Natural Gas Market



Natural gas was introduced to Sweden in 1985 through an expansion of the Danish natural gas network to southern Sweden through a transmission pipeline from Dragør on Amager to Klagshamn outside of Malmö.

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

The gas network

The Swedish natural gas network consists of 620 km of transmission pipeline and 2720 km of distribution pipes. The natural gas network is divided into four different operational areas: transmission, distribution, gasification and storage. In the transmission pipelines the long distance transport takes place under high pressure. There is a subsequent pressure reduction at metering and regulation stations before the local distribution network is used to transport gas to the customer. The transmission network is owned by the company Swedegas.

The Swedish natural gas network stretches from Trelleborg in the south to Stenungsund in the north and also branches off into parts of Småland. Of Sweden's 290 municipalities, 30 or so have access to natural gas. Natural gas makes up a small proportion of Sweden's energy needs. In the municipalities that are supplied with natural gas, however, it accounts for about 20 per cent of the total energy consumption; this is in line with the average across the rest of Europe which has a higher penetration of gas in the energy mix. Existing pipelines are shown in figure 15.

Figure 15. The Swedish natural gas network



Source: The Swedish Gas Association (*Energigas Sverige*)

Distribution companies reserve capacity

The Swedish natural gas network's transmission capacity amounts to 22 TWh per year, which means that there is the potential to increase gas transmission within the existing national natural gas system.

Within the EU, the Member States are working to achieve equal market conditions and regulation in order to bring about cross-border trade and a common market. There are two main models that are used to deliver natural gas, it is partly the shipper model that is used in the rest of Europe and partly the Swedish model. The main difference between the two models is in which party reserves and utilises the transmission system capacity. In the shipper model, reservation is performed by commercial wholesalers (shippers). In the Swedish model, it is the distribution

companies which are responsible for reserving capacity in the transportation system. The aim of the Swedish model is that the reservation of natural gas transmission capacity will be similar to the model that is used in Sweden for electricity. There is one certified transmission system operator (TSO) and five distribution system operators (DSO) in Sweden.

As a result of the gas market model that is used in Sweden, there is no second-hand market for transmission capacity in which spare capacity is made available for trading.

Swedegas becomes the new balancing authority

The government has appointed Swedegas AB as the system balancing authority for the national gas network, beginning on 1 June 2013.⁵⁵ This means that Swedegas looks after the operation and maintenance of the system, as well as having responsibility for maintaining the short-term balance between input and outflow of natural gas from the national system.

In order to maintain the short-term balance in the natural gas system, Swedegas has contracts for balancing responsibility with natural gas companies. The balancing authority is financially responsible for ensuring that the end-users' consumption is equivalent to the supply. Balancing takes place daily. Because the transmission network acts as a storage facility, the tolerance level for short-term imbalance may be up to 25 per cent of consumption on a winter's day.

According to the Natural Gas Act, Swedegas may not enter into contracts for balancing responsibility with individual gas wholesalers before the methods that have been used to design the contract have been approved by Ei.

Ei has certified Swedegas as a transmission system operator for natural gas

According to the gas market directive⁵⁶, transmission system operators must be certified. As part of the work towards certification, the European Commission⁵⁷ remarked on Ei's preliminary decision in advance of Ei making its final certification decision. The final decision to certify Swedegas as the transmission system operator for the Swedish national gas network was made by Ei in July 2012.

Certification is valid indefinitely, but it can be reassessed by Ei if the transmission system operator does not live up to the certification requirements.

Functional differentiation of natural gas companies

With the aim of preventing cross subsidisation, there is a requirement that natural gas companies are functionally differentiated. Operations must be kept separate for the purposes of accounting. This means that a company which conducts natural gas transmission may not conduct trade in natural gas within the same subsidiary. In a company that has a natural gas pipeline concession, a board member, Managing Director or authorised signatory may not occupy any of these roles in a company that trades in natural gas. However, there is no Swedish legislation that

⁵⁵ SvK was the previous balancing authority.

⁵⁶ According to Article 10 of the gas market directive.

⁵⁷ The European Commission checks that Member States only certify competent transmission system operators.

forbids a gas network company from being part of a conglomerate that also conducts production of, or trade in, natural gas.

In cases where a natural gas company does not follow the regulations in the Natural Gas Act (2005:403), Ei is able to order the company to take corrective measures in order to fulfil the regulations. An order may be subject to a fine.

According to the Natural Gas Act, all companies that conduct the transmission of natural gas must draw up a monitoring plan. The companies must also publish an annual report which gives an account of the measures they have implemented according to the plan. The aim of the monitoring plan is to ensure that the companies act objectively and do not unjustifiably favour any particular player in the market. The monitoring plan must state the measures that will be taken to prevent discriminatory behaviour against other players in the market.

Quality control of the natural gas network

The Swedish transmission system primarily consists of steel pipelines. The system's functions are regularly checked, and defects or worn-out equipment replaced. The lifespan of the pipes is expected to be a minimum of 40 years, while certain pieces of equipment for monitoring, control and regulation are expected to last for 15-20 years. Table 4 shows a list of the checks that are carried out, their frequency and how they are conducted.

Table 4. Individual check of the transmission system

Check of the transmission system	Time Interval	Method
Monitoring of works taking place close to a pipeline	6 /year	Aerial inspection
Inspection of the protection zones close to built-up areas	Annual	Inspection from the ground
Inspection of the Öresund Pipeline	Every third year	Echo-sounding
Inspection of protective coating around the pipeline	Every eighth year	Inspection using "intelligent pig" ⁵⁸
Check of the thickness of pipeline material	Every eighth year	Inspection using "intelligent pig"

Source: Ei

Distribution pipes are primarily constructed of polyethylene. Steel pipes are used in certain cases for customers who require a gas pressure greater than four bar. Guidelines for the execution, operation, care, maintenance etc. of distribution networks for a maximum operating pressure of four bar are harmonised in the energy gas standards that have been worked out by the trade association the Swedish Gas Association.

Review of gas network fees

Ei regulates the gas network companies and must approve the methods these companies use to calculate their network fees. In the formulation of the fees for transmission or natural gas, specific consideration will be given to the number of customers that are connected, the geographical position of the customers, the

⁵⁸ Automatic investigation device that is sent into the gas flow in order to examine the welded joints in the pipeline.

quantity of energy transmitted, the contractual costs of overlying pipes, security of supply and the pressure in the pipes.

On 1 July 2012, a change came in to force as a result of the gas market directive⁵⁹. This means that the Natural Gas Act has been broadened so that the methods for calculating tariffs for access to gasification facilities must also be approved. Access tariffs are not applicable prior to approval of the methods used to calculate the tariffs by Ei.

Ei's regulation of the methods that form the basis of the calculation of fees aims to ensure that they are objective and non-discriminatory in accordance with the requirements of the Natural Gas Act. Ei's regulatory decisions may be appealed within three weeks by the party the decision concerns. Review also takes place in the administrative courts.

The Swedish Parliament has adopted the government's bill⁶⁰ on changes to the Natural Gas Act in order to facilitate the prospective regulation of natural gas tariffs in Sweden. The new regulations came into force on 1 June 2013. This means that natural gas network companies will apply in 2014 for revenue frameworks for an initial four-year period beginning at the start of 2015 and ending in 2018. Ei will make a decision on the revenue frameworks at least two months prior to the frameworks coming into force, i.e. by 31 October 2014 in the first round. Up until 2015 the fairness of the network fees is reviewed retrospectively.

The gas network companies are obliged, according to the Natural Gas Act, to draw up, in the form of an annual report, separate financial accounts for their transmission, distribution, storage and gasification activities. The annual report⁶¹ must have reached Ei within seven months of the end of the financial year. This forms the basis of further regulation.

Cooperation for collective development of the gas market

Ei conducts cross-border cooperation as part of several bodies. Despite there being no formal cooperation with the other Nordic regulators with regard to the gas sector, continual discussions are ongoing with the Danish regulator about how the common market can be developed and in what way the security of supply can be improved. Moreover, Ei cooperates with European regulators in Germany, the Netherlands, Belgium, Luxembourg, France, the United Kingdom and Ireland.

The objective of this cooperation is a common European gas market model in 2014. The cooperation also aims to speed up the incorporation of European legislation. Ei has contributed to this work by producing framework guidelines in accordance with the process that have been set out for the production of European regulations on the internal market for natural gas, through the cooperative bureau ACER, and submitted its opinions on network codes, such as those for balancing, to ENTSOG.

⁵⁹ Article 41.6 a.

⁶⁰ Government bill 2012/13:85.

⁶¹ The annual report shall contain comprehensive financial results and balance sheet for each of the reporting units.

Ei's work with regard to national and European natural gas legislation

Ei is the regulator according to the Natural Gas Act⁶². The Act⁶³ states that the regulator ensures that the regulations in the Natural Gas Act are observed. Ei also ensures that the regulation⁶⁴ on conditions for access to the natural gas transmission networks is followed. Ei is directed by the government to discharge the duties within its area that result from the EU's gas market directive.

According to the gas market directive⁶⁵, the regulator will follow and implement the legally binding and relevant decisions made by ACER and the European Commission. No specific legislation is required in order for this to apply in Sweden because the provision has an advisory character. There is a requirement that it is clear in other regulations, for example, an EU regulation, which decisions are binding and relevant. In order to make it possible for Ei to follow the Commission's decisions, provisions have been introduced into the Natural Gas Act⁶⁶ and in the Act (2011:711) on the certification of certain natural gas companies⁶⁷. These provisions mean that Ei, in decisions which are affected by such guidelines as are referred to in Article 43, must specify that the decision may be altered or annulled at the request of the European Commission.

Ei may, according to the Natural Gas Act⁶⁸, issue such enforcement orders as are required in order to ensure compliance with the regulations and provisions that are covered by its role as regulator. Such an order may be associated with a fine. There is nothing to prevent such fines from amounting to up to ten per cent of a company's turnover. The law⁶⁹ also stipulates that the regulator is entitled, upon request, to obtain such information and access such documents as are necessary to undertake its regulatory role. The regulator may also issue such enforcement orders as are required in order to ensure compliance with the regulations that are within the scope of its regulatory role.

⁶² Chapter 1, Section 9.

⁶³ Chapter 10, Section 1, Paragraph 1.

⁶⁴ (EC) No 715/2009.

⁶⁵ Article 41.1 d.

⁶⁶ Chapter 10, Section 1a.

⁶⁷ Chapter 3, Section 4 and Chapter 4, Section 3.

⁶⁸ Chapter 10, Section 3.

⁶⁹ Chapter 10, Section 2.

Gas supply

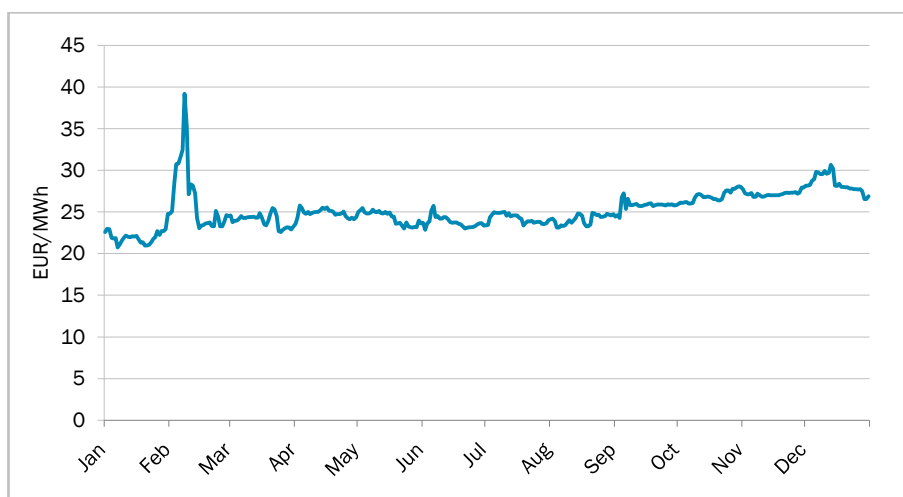
Sweden does not produce any natural gas of its own, instead all natural gas is imported from Denmark. Biogas production is, however, increasing in Sweden. Between one and two per cent of the natural gas that is distributed in the Swedish natural gas system consists of domestically produced biogas. Both the quantity of biogas produced and the amount that is introduced into the natural gas network is constantly increasing. It is also a political ambition to completely replace natural gas with biogas in the long-term.

Trade in natural gas

Trade in natural gas from Denmark takes place on Nord Pool Gas. Trade in gas for physical delivery takes place on Nord Pool Gas. The exchange is wholly owned by the Danish transmission system operator Energinet.dk and is a marketplace for producers, natural gas suppliers, energy companies and larger consumers. The electricity market exchange, Nord Pool Spot, works as a clearing house for Nord Pool Gas and acts as the counterparty in all transactions in order to guarantee daily settlement. Natural gas suppliers may trade on the exchange themselves or use agents. The gas exchange had over 20 members in 2012.

The price on Nord Pool Gas is set based on supply and demand for natural gas in Denmark which, in turn, affects the conditions for import and extraction of gas, as well as the price of substitute fuels. The daily price on Nord Pool Gas is set based on a weighted average of the day's trading. The development of the price on the gas exchange is shown in figure 16.

Figure 16. Price development in 2012 on Nord Pool Gas⁷⁰, daily average EUR/MWh



Source: Nord Pool Gas

Reduced natural gas consumption

In 2012, 12.9 TWh of natural gas was used in Sweden (see Table 5), a reduction of 14 per cent from the previous year. The reduction was, for a large part, due to milder temperatures which reduced the consumption and because larger consumers had shut down their facilities for parts of the year.

⁷⁰ Closing prices for the following day.

The existing transmission pipeline between Malmö and Gothenburg has the capacity to transport 22 TWh per year. By increasing the working pressure, with the help of compressors, the capacity can be increased to about 30 TWh.

Table 5. The development of natural gas transmission⁷¹

	Total consumption (TWh)	Production	Import capacity (TWh) total
2006	11.1	0	15
2007	11.8	0	15
2008	10.3	0	15
2009	13.9	0	15
2010	18.7	0	22
2011	15.0	0	22
2012	12.9	0	22

Source: SvK and Swedegas

Close to 45 per cent, 5.8 TWh, of the natural gas was used by industry, which was an increase, compared to 2011. Following industry, combined heat and power and district heating facilities were responsible for the second largest portion of the consumption, 36 per cent (4.7 TWh). The proportion of natural gas that was used for combined heat and power and district heating has decreased in recent years. This is because of an increased use of other forms of energy than natural gas.

Domestic customers accounted for 0.6 TWh, 4.5 per cent of total consumption, which was a reduction of 35 per cent from the previous year. The remaining consumption, 1.9 TWh, is categorised as other business use.

⁷¹ Consumption is expressed in gross calorific value. The net calorific value is about ten per cent lower.

The consumer market

The final stage in the opening up of the consumer natural gas market to competition took place in 2007. Since then, all natural gas customers connected to the Swedish natural gas system have been free to choose natural gas supplier.

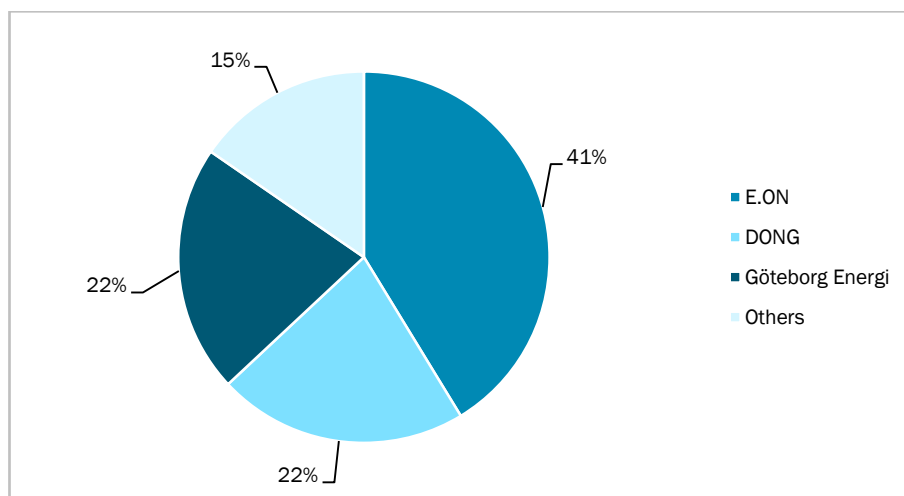
In Sweden, there are about 37,000 natural gas customers, about 33,400 of these are domestic customers and the remaining are business customers.

Few players in the natural gas market and reduced customer activity

Since the introduction of natural gas, the Swedish natural gas market has been characterised by having only a few players. In 2012, there were six natural gas suppliers⁷² active in the Swedish market.

The three largest natural gas suppliers, E.ON, Dong Energy and Göteborg Energi, between them accounted for 85 per cent of the market in 2011 (see figure 17). This proportion has not changed significantly in 2012. Dong Energy is mainly owned by the Danish State (close to 80 per cent) and E.ON Sverige is owned by E.ON AG, which is the world's largest privately owned energy company. Göteborgs Energi AB is owned by the City of Gothenburg. There is no collected details on the companies' market shares available, instead, each network owner has their own statistics about which companies are active in each distribution network.

Figure 17. Market share of the consumer market for natural gas in Sweden 2011



Source: Ei

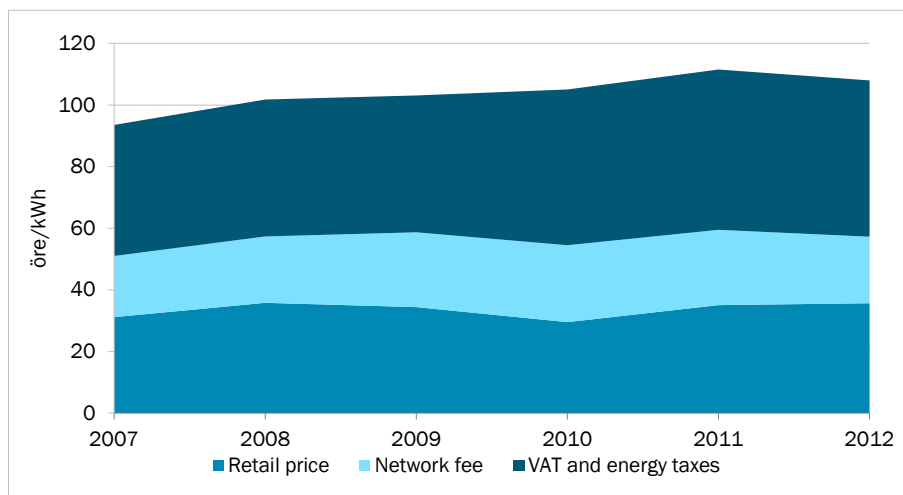
Over the course of 2012, Swedish domestic natural gas customers changed supplier 157 times in total, a reduction of 44 per cent, compared to the previous year. The number of changes is at a continually low level and is equivalent to just under half of one per cent of the total number of domestic customers. The equivalent figures for non-domestic customers were 120 changes, or three per cent of all non-domestic customers.

⁷² E.ON Gas Sverige AB, Modity AB, Varberg Energi AB, Göteborg Energi AB, Dong Energy AB and ApportGas AB.

Energy tax and VAT comprise the largest proportion of the total natural gas cost

The total cost of natural gas has increased by about 15 per cent since 2007 (see figure 18). In 2012, the total cost for a household with gas heating amounted to about 108 öre per kWh, equivalent to SEK 21,600⁷³ per year. This was a marginal decrease (one per cent), compared with the previous year.

Figure 18. Real-terms change in the total cost of natural gas for a household with gas heating⁷⁴



Source: SCB

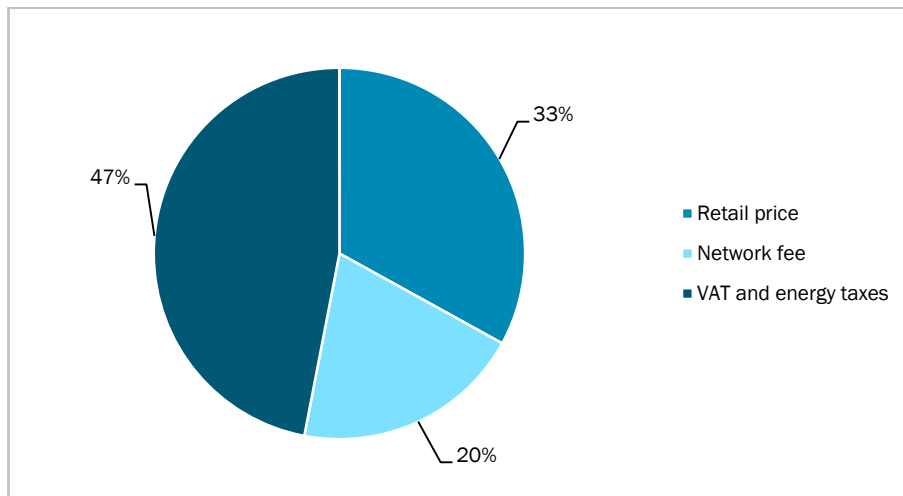
The total cost of natural gas for a household is divided into gas supply price, gas network, tax and VAT. The gas supply price's proportion of the total cost of natural gas increased in comparison with 2011. For a domestic customer, the gas supply price constituted 33 per cent of the total cost of natural gas in 2012, compared to 31 per cent the previous year. The network fee accounted for 20 per cent, while energy tax and VAT combined comprised about half of the total cost, 47 per cent (see figure 19).

The price of natural gas has, up until now, been related to the consumer's cost of using alternative forms of fuel, usually oil products. The price has thus, with something of a time-lag, tracked the price of oil. However, there is now an ongoing transition towards the price being set based on the exchange price on Nord Pool Gas.

⁷³ With a consumption of 20,000 kWh.

⁷⁴ Consumption category D2, annual consumption 5,500 – < 55,000 kWh. Heating and gas for domestic use. The mean value is adjusted for 2012's price level.

Figure 19. Total natural gas cost for a domestic customer in 2011



Source: SCB

Ei supervises the natural gas market

Ei continually monitors the function of the natural gas market as a result of its regulatory role as stipulated by the Natural Gas Act. Ei is directed by the government with the duty to monitor and analyse the development of the natural gas market and submit proposals for changes in regulations or other measures to improve the function of the market. Ei is also charged with the role of working to promote effective competition in the natural gas market.

Security of supply

Although the security of supply has historically been high, the Swedish natural gas market may still be seen as vulnerable in both the short and the long-term. Having a single point of supply, combined with the fact that Sweden does not produce any natural gas of its own, makes the Swedish natural gas market sensitive to external disruptions in the short-term. In the longer-term, gas deliveries from Denmark will decrease. The cause is that the supply of gas from the Danish gas fields is decreasing.

New projects can contribute to increased use of natural gas

There are currently a number of extraction and production projects underway within the Swedish natural gas system. Consumption of natural gas is expected to increase accordingly in years to come.

A gasification facility for biofuel is planned for Gothenburg which is expected to be capable of producing about 100 MW of gas of a quality that is equivalent to natural gas. In the first stage, the planned production capacity is 20 MW. The first stage is expected to be completed in the third quarter of 2013. Decisions have not yet been made on investment in further expansion.

A liquefied natural gas (LNG) terminal is currently being constructed in the Port of Gothenburg.⁷⁵ The first stage is intended, primarily, to provide LNG for transport, for example, as fuel for boats and vehicles. The second stage will include an LNG regasification plant, which will feed natural gas into the natural gas system on the west coast. The terminal is expected to be ready in 2016. The facility is being connected to the natural gas system mainly for the purposes of security of supply.

New feed into the natural gas system

The gas pipeline Nord Stream began operating in 2012 and transports Russian natural gas to the European gas network. The pipeline is actually two parallel pipelines that pass through the economic zones of five countries (Russia, Finland, Sweden, Denmark and Germany). The aim of the project is to create an alternative supply route from the Russian gas reserves. Russia is the single largest supplier of gas to Europe; previously supply has taken place through pipelines that go through Ukraine. Sweden receives indirect deliveries of gas from Russia through Nord Stream after it has been through Germany and Denmark.

A storage facility for natural gas

Natural gas is stored in two ways. One method is through input of additional gas into the transmission pipelines and thereby increasing the pressure in the transmission system, called 'line pack'. The other is through storage in dedicated storage facilities that are connected to the transmission system.

In Sweden there are only small storage facilities to cope with seasonal variations in the consumption of natural gas. The withdrawal capacity of the storage facilities varies from 0.6 to 0.9 Nm³ per day. This is equivalent to 10-20 per cent of the daily requirement of gas in the Swedish market in winter conditions. The variation is caused by the prevailing pressures in the storage facilities and transmission

⁷⁵ The work is being carried out jointly by Swedegas AB, Göteborgs Hamn AB and Vopak LNG Holding B.V. from the Netherlands.

pipelines. The storage facilities are owned by Swedegas and are located in southern Halland.

Measures to cope with peaks in consumption and insufficient delivery

The Swedish Energy Agency is the regulator in accordance with the Act⁷⁶ on security of natural gas supply. In accordance with the requirements of regulation on the security of natural gas supply⁷⁷, a national preventative action plan and a national emergency plan for securing the supply of natural gas were published in 2012.

The supply regulation stipulates that the emergency plan of each Member State must be built on three crisis levels: early warning, alert and emergency. The responsible parties must adopt measures at each of the three levels to mitigate the effects of the situation that has occurred. These measures are divided into market-based and non-market-based measures, with non-market-based measures only being used once market-based mechanisms are no longer able to secure the supply to protected customers and the crisis level 'emergency' has been declared.

Initially, peaks in consumption and insufficient deliveries are managed by the balancing authority using the balancing space that is provided by pressure variations in the transmission system (line pack). If additional measures are required, Swedegas uses market mechanisms to manage imbalances for as long as possible. The Swedish Energy Agency may also order network owners to limit or cut off supplies of natural gas to their customers. If this is done, supply to consumers will be safeguarded.

The owners of natural gas pipelines, storage facilities or gasification facilities must adopt whatever measures, in terms of planning or otherwise, are required for ensuring the operation and security of their own facilities in the event of an emergency situation.⁷⁸ The measures will encompass the management of emergency situations, information management in such situations and regular assessments of vulnerability and threat level. The owners must draw up an emergency management plan, as well as ensure that the plan is distributed throughout their organisation and followed. The owners must also inform the transmission system operator and other stakeholders of their plans.

⁷⁶ Act (2012:273).

⁷⁷ (EU) No 994/2010.

⁷⁸ The regulations are set out in the Swedish Energy Agency's Regulations and General Advice on Company Planning and on the Obligation to Submit Information about Natural Gas Supply, STEMFS 2012:4.

Consumer protection and dispute resolution

Consumer protection consists of laws, regulations, general and specific contractual terms and also public authorities and organisations that attempt to safeguard the interests of the consumer. It is important that the consumer knows what rights they have and where they can turn in the event of a problem.



Consumer protection

Ei's supervision of consumer regulations

As a result of the EU's third directive on the internal market⁷⁹ for electricity and gas, a range of consumer regulations were implemented in the Electricity Act and the Natural Gas Act in 2011. In 2012, Ei has continued the review it had already begun of the electricity suppliers' obligations under these regulations. This supervision has, for example, included the electricity suppliers' obligations to state in their consumer contracts what undertakings they have in relation to the consumer, the terms for billing, payment, extension and cancellation, as well as the terms for compensation should the electricity supplier not fulfil their undertakings. In addition, the review looked at whether the electricity suppliers, on their websites and bills, provided or directed the customer to information on consumer rights, on how to submit a complaint and where to turn for information and dispute resolution. Once Ei had called their attention to the deficiencies, the electricity suppliers under review took the appropriate measures to rectify them.

Consumers have the opportunity to report an electricity or gas company that does not follow the regulations in the Electricity Act or Natural Gas Act to Ei. As the regulator, Ei can investigate whether the company is in breach of their legal obligations. In 2012, the number of cases reported to Ei amounted to 17.

The Swedish Consumer Energy Markets Bureau as the national contact point

In 2012, Ei has also continued its work as one of the agencies responsible for the Swedish Consumer Energy Markets Bureau (KE). KE is an independent bureau that provides information and guidance to consumers on issues relating to the electricity and gas markets (the organisation also deals with issues relating to district heating). Advice is free of charge. At the beginning of 2012, an agreement came into force between Ei and KE which means that KE is now the national contact point for the electricity and gas markets. This fulfils the requirement of the EU's electricity and gas market directives.

The bureau received about 2,300 enquiries from consumers in 2012, primarily relating to the electricity and gas markets, but the vast majority of these concerned the electricity market. In total there was a small decline in the number of direct contacts, compared with 2011. About half of the enquiries were complaints about the companies' treatment of customers. KE contribution meant that the complaints were quickly brought to the companies' attentions so that they could then be resolved in a proper and customer friendly way. Many of the complaints in 2012 concerned the electricity market and many of them were associated with the use of high pressure sales tactics to sell electricity contracts. Some examples of when high pressure sales tactics are used: telephone sales, doorstep selling and selling on the street. KE could also see that the complaints concerning bills and electricity consumption had reduced. The few complaints relating to the gas market have, for example, concerned price rises and problems with contracts.

⁷⁹ Directive 2009/72/EC of the European Parliament and of the Council.

Assistance for vulnerable customers

In accordance with the EU's electricity market directive, Ei investigated the number of vulnerable customers in the Swedish electricity market in 2012. The definition of vulnerable customers is set out in Ei's charter, which says "vulnerable customers are persons who, in the foreseeable future, lack the ability to pay for the electricity or natural gas which is transmitted or delivered to them for purposes which fall outside of the scope of business activities". This category of consumer is protected in the Swedish electricity and gas markets by social legislation in that the consumer has the right to receive assistance with their electricity and natural gas supplies.

There are also provisions in both the Electricity Act and the Natural Gas Act that protect consumers who are at risk of being disconnected from the electricity or natural gas networks as a result of unpaid bills or other significant breaches of contract. This means that consumers can be disconnected from the electricity or gas networks in the case of a significant breach of contract, but that the company who undertakes the disconnections must first follow a certain procedure that is set out in law. This includes, for example, the consumer's right to accurate information from the company, the opportunity for the consumer to rectify the situation without being disconnected, and also that the company must notify the social services in the municipality where the consumer lives a certain time in advance of the disconnection taking place. Ei investigated the number of vulnerable customers in the Swedish electricity market in 2012 and found that there were about 20,000 consumers who fell within the scope of the Swedish definition of the term.

Default electricity supplier – for customers who have not chosen

The Swedish consumers have the opportunity to choose their electricity and/or natural gas supplier. This means that both these players must be active in the open market in competition with other companies, and also that pricing is discretionary. If the consumer does not make a choice or lacks an electricity or natural gas contract in some other way, the consumer defaults to a predetermined electricity or gas supplier. In the electricity market, just over 18 per cent of Swedish domestic customers remained on the default price in 2012; equivalent to 840,000 households. At the same time, the difference between the default price and the price of other contracts is becoming greater. For 2012, the difference was 50 per cent between a customer paying the default price and a customer paying the variable price.

For the gas market, with about 33,400 domestic customers, there is no data on the distribution by contract type.

The consumer has the right to meter values

Consumers in the Swedish electricity market are guaranteed information about their consumption in accordance with the electricity network companies' obligation to provide the consumer with their metered values by the time they are charged, at the latest. This obligation also covers information about the meter reading at the end of each month (if the billing period is longer than one month), annual consumption and annual consumption in kWh for the last thirteen months. The electricity network companies are obliged to provide consumers with this information in an easily understandable format, and the information will usually be provided to the customer on their bill or once they have logged into their

account on the electricity network company's website. In 2012, Ei has continued its supervision in line with these regulations.

Other consumer advice

Among the other agencies that have a responsibility to electricity and gas consumers, the Swedish Consumer Agency (*Konsumentverket*, KoV) is worth highlighting. KoV investigates, for example, whether companies have used misleading or aggressive marketing, unfair contractual terms or provided insufficient price information. KoV has also negotiated new general contractual terms with the electricity and gas industry. These came into force for electricity in 2012. The contractual terms for gas will be implemented in 2013.

For advice on various issues, electricity and gas consumers also have the opportunity to turn to the municipality in which they live. There are consumer advisers who offer, amongst other services, advice before signing a contract and guidance on disputes. Budget and debt advisers can offer advice and support in the event of payment problems, while energy and climate advisers can offer analysis of energy consumption and advice when choosing a new source of heating.

Dispute resolution

Disputes that are managed by Ei

Ei checks that the companies in the electricity and natural gas markets abide by the law and, in certain cases, can also settle disputes between consumers and companies. This concerns, for example, complaints relating to the cost of metering of the consumer's electricity consumption, as well as the charges and terms affecting the consumer in conjunction with their connection to the electricity network.

As stipulated in the Electricity Act, the connection charge must be fair, but if the consumer considers the cost to be too high, they may refer this to Ei for investigation. If Ei concludes that the connection charge is too high, the electricity network company must refund the difference to the consumer. Ei's decision on the fairness of the connection charge may be appealed, and it is the courts who ultimately determine what applies. Requests for Ei to investigate and appeals of the decision are free of charge.

Assistance with settling disputes from the National Board for Consumer Disputes

Electricity and natural gas consumers may report disputes with companies to the National Board for Consumer Disputes (*Allmänna reklamationsnämnden*, ARN). This is a fast and simple, yet still legally secure, alternative to using the courts. ARN is a public authority which adjudicates in disputes between customers and companies, for example, in the electricity and gas market. This service is free of charge. ARN will not perform its own investigation, relying instead on the parties involved to submit and present background information for it to consider. When passing judgement in a dispute, ARN will base its decision on the applicable law, i.e. legislation and legal precedent. ARN's decision includes a proposal for how the dispute should be settled. In order for a consumer to be able to report a dispute to ARN, the company must have rejected the consumer's claim, the complaint must be made within six months of the day the company rejected the consumer's claim and also that the consumer's claim has a value greater than SEK 2,000. In each case, ARN will respond within five to six months of when the complaint was received.

The consumer may also turn to the district court in order to resolve a dispute with an electricity or natural gas company.

