

EI R2012:11

The Swedish electricity and natural gas markets 2011





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The Swedish electricity and natural gas markets 2011

The Swedish Energy Markets Inspectorate

P.O. Box 155, SE-631 03 Eskilstuna, Sweden

The Swedish Energy Markets Inspectorate 2012:10

Authors: Håkan Östberg, Sigrid Granström, Tommy Johansson,
Rémy Kolessar, Conny Bäckman, Margareta Bergström, Johan Roupe,
Björn Ter Bruggen, Dennis Jonsson, Göran Morén and Petra Lindmark

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Foreword

The Swedish Energy Markets Inspectorate (EI) is the national regulatory authority for the electricity, natural gas and district heating markets. The purpose of this report is to account for the development of the electricity and natural gas markets during 2011.

In accordance with its instructions, the Inspectorate shall undertake tasks that stem from the EU Electricity and Natural Gas Market Directives. This includes the preparation of an annual report in compliance with the reporting requirements contained in the Directives. The report addresses issues relating to regulation, competition and security of supply and it is produced in accordance with the reporting requirements in the Electricity and Natural Gas Directives. The sections concerning security of supply on the natural gas markets have been drafted in consultation with Svenska Kraftnät.

The report follows the structure developed in cooperation with the other European regulatory authorities and the EU Commission. Within the European cooperation, a report summarising all national reports will be published during the autumn of 2012. This report, together with the national reports of all member states, will be available on the website of the CEER (Council of European Energy Regulators); www.energy-regulators.eu.

Eskilstuna, June 2012



Yvonne Fredriksson
Director-General



Håkan Östberg
Project Leader

Contents

Summary.....	9
The electricity market.....	16
The electricity network	17
Transmission limitations lead to Nordic sub-markets	19
Development of Sweden's electricity network fees	20
New mapping of local network tariffs.....	22
New method for auditing network fees	22
Audit of the 2010 network fees.....	23
El supervises the transmission systemoperator	25
Transmission limitations generate bottleneck revenues	26
Certification of transmission system operator on the electricity market	27
Security of supply in the electricity network	27
Continued work towards increased European harmonisation	29
Joint Nordic balance regulation	30
Cross-border cooperation	31
The wholesale power market	33
Trading on Nord Pool Spot and Nasdaq OMX	33
Large price variations during 2011	34
Increased Swedish electricity production and reduced electricity use during 2011.....	35
Three major Swedish electricity producers.....	36
Improved prerequisites for competition with bidding areas.....	37
The decommissioning of German nuclear power will impact on the Nordic electricity market	38
Several public authorities monitor the electricity market	38
The Swedish Competition Authority's areas of responsibility and its operations on the electricity market	39
Measures to reduce the risks of the co-ownership of nuclear power plants	39
Nord Pool regulations - price-influencing information and market supervision	40
Greater transparency in Nord Pool Spot operations	41

The retail market	43
The work on a Nordic retail market is in the middle of an intensive phase	43
Electricity supply costs is the larger part of total electricity costs for private customers	44
Falling electricity supply prices	44
Most customers choose fixed price contracts.....	45
More than every third household changed or re-negotiated their contract	46
The web-based price comparison site Elpriskollen	46
The Swedish Consumer Energy Markets Bureau was appointed a common contact point for consumers	47
Electricity suppliers are obliged to state the origin of the electricity	47
Implementation of consumer protection measures in the Electricity Market Directive	48
The Energy Markets Inspectorate work in line with national and European legislation.....	49
Security of supply	50
The installed electricity generation capacity continued increasing	50
Market-based power reserve	51
New transmission links	52

The natural gas market	54
The natural gas network	55
No transmission limitations in the natural gas network	56
Svenska Kraftnät a balance provider	56
Audit of gas network costs	57
Separation between transmission of and trading in natural gas	58
Increased international cooperation	58
The wholesale power market	60
The retail market	61
Few market actors	61
Network fees make up the largest part of natural gas costs for households	61
More consumers switched natural gas suppliers during the year	62
Implementation of consumer protection measures in the Gas Market Directive.....	62
The Swedish Energy Markets Inspectorate works in line with national and European legislation	63
Security of supply	64
Reduced consumption of natural gas during the year	64
A storage facility for natural gas	64
Plans for new supplies to the natural gas system	65
Quality control of the natural gas network	65
Measures to address consumption peaks and delivery shortfalls	66

Summary

The electricity market

The Swedish electricity market was deregulated in 1996, since when electricity trading and generation have been open to competition, while network operations are a regulated monopoly. The aim of deregulation was to increase consumer choice and provide conditions for an efficient utilisation of the generation resources. For efficiency reasons, the electricity networks were retained in a regulated monopoly.

The Swedish electricity network consists of 538 000 kilometres of conductors, of which 320 000 kilometres are underground cables and 218 000 kilometres are overhead lines. State-run Svenska Kraftnät is responsible for maintaining the power balance and the operational reliability of the Swedish transmission system. The local and regional network companies are responsible for ensuring an adequate network maintenance level in order to guarantee that security of supply is maintained within their own networks.

The Swedish wholesale power market is part of an integrated Nordic power market, which in turn is part of a growing European electricity market. Electricity generation in Sweden is mainly based on nuclear and hydroelectric power plants, and in a normal year these two power sources account for around 90 % of the total national electricity generation.

On the Nord Pool Spot electricity exchange, electricity is bought and sold among actors in the Nordic countries and high turnover by Nord Pool Spot boosts confidence in price formation. Nord Pool Spot's market share of total consumption in the market area was between 70 and 75 % in 2011, which is one of the highest levels in Europe. The total traded volume fell slightly during 2011 in comparison with the previous year, from 307 TWh in 2010 to 297 TWh in 2011, which is largely due to reduced electricity consumption in the Nordic countries.

The Swedish end-user market for electricity is, unlike that wholesale power market, a national one, but for several years now there has been a political will to establish a common Nordic end-user market by 2015.

Falling demand, increased Swedish electricity generation and volatile electricity prices during the year

Electricity prices during 2011 were characterised by large price variations. Prices during the first six months were clearly above average, as a result of

very low rainfall, late spring floods and relatively low availability of nuclear power. The Nord Pool Spot system price during the first six months of 2011 reached more than SEK 0.70 per kWh. A wet summer and autumn contributed to monthly average prices falling during the second half of the year. The shortfall in water storage of 30 TWh which arose during spring turned into a surplus of 10 TWh during autumn. Prices during the second half of 2011 fell to an average of SEK 0.25 per kWh. The average spot price in Sweden for the whole year was just above SEK 0.42 per kWh, which is a reduction of 16 % compared to 2010.

During 2011, total electricity production in Sweden amounted to around 147 TWh, an increase of just over 1.4 % compared to 2010, at the same time as electricity consumption fell to 139.7 TWh.

More often common electricity price in the Nordic countries

As a result of the transmission limitations within the Nordic countries, Nord Pool Spot has divided up the Nordic electricity market into bidding areas. The prices are determined by production and consumption within each area, and by transmission of power to and from the area.

During 2011, the Nordic countries had a common electricity price during 26 % of the time. This is an increase of just over 8 percentage points compared to 2010, when the electricity price was common during 18 % of the time. The increase is due to an improved hydrological balance, slightly greater availability of nuclear power and reduced demand for electricity in the Nordic countries.

As from 1 November 2011, Sweden manages transmission limitations by using market splitting. When bidding areas were introduced, large price differentials arose between SE4 (Malmö) and other Swedish bidding areas. The price difference can be explained by the introduction coinciding with falling Nordic temperatures, reduced transmission capacity between Sweden and Finland and the fact that all nuclear power reactors at Ringhals were out of commission. Closer to the year-end, availability from Swedish nuclear power had increased and the transmission between Sweden and Finland was restored, which meant that price differences were considerably smaller. As expected in advance, prices in SE4 were largely identical to those in DK2 (western Denmark).

Increased Swedish network fees

The network fee usually consists of a fixed part and a variable part. For single-family houses with electric heating, the fixed part constitutes just under half the network fee on average. The variable part of the network fee can be affected by the consumer through the amount consumed. During the year, network companies raised their fees by 0.4 % for consumers in flats, by 3.1 %

for consumers in single-family houses without electric heating and by 3.1 % for consumers in single-family houses with electric heating. Counted in SEK, the increase corresponds to SEK 5, 8 and 111 per year.

The Swedish Energy Markets Inspectorate checks annually to ensure the network fees of the network companies are reasonable. It was the Inspectorates decision that the majority of the network companies in the country charged a reasonable return in relation to the limits set by the EI.

Fixed electricity price is the most common contract form

The Swedish retail market for electricity is currently national. For several years, there has been a political will to create a joint Nordic retail market for electricity. A joint Nordic retail market would mean that consumers in the Nordiccountries could freely choose electricity suppliers across national borders.

The total electricity cost for households can be divided up into electricity supply price, network fee and also energy tax and VAT. The proportion of the electricity supply price of the households' total electricity cost has increased over the last decade. In January 2012, the electricity supply price for a household customer living in an electrically heated single-family house made up 49 % of the cost, compared to 47 % one year earlier. The network fee made up 15 %, while energy tax and VAT together represented 36 %. The total electricity cost for a household in 2011 amounted to SEK 1.37 per kWh, or SEK 27 400 for the year.

In total, more than 1.6 million households were active on the electricity market during the year, either by changing electricity suppliers or by entering into a new contract. This corresponds to almost 37 % of the total number of householdcustomers on the Swedish electricity market. Increased activity among customers leads to increased competition among electricity suppliers, which may put downwards pressure on price and favour customers through better offerings.

In order to facilitate for customers to choose the contract and the electricity supplier that suits them best, the EI provides the web-based price comparison site Elpriskollen, showing prices and terms from all electricity suppliers in Sweden.

Sweden's electricity generation capacity increased during the year

Supply security in the Swedish electricity system is generally good. It has never been necessary to resort to manual disconnection of consumption, which is the method the Swedish TSO must use in accordance with the Electricity Act when it is impossible to achieve balance between generation and consumption in the electricity system.

During 2011, an additional 948 MW of generating capacity at Sweden's power stations came on line, while 202 MW was decommissioned. The net increase was therefore 746 MW, which brought the total capacity to 36,447 MW.

The long-term forecast of the Swedish Energy Agency was published in spring 2011, and addresses the long-term development of the power system up until 2030, by which time Sweden is expected to export 23 TWh of electricity. This is due to increased electricity generation and a moderate increase in electricity use. By 2030, electricity generation is expected to total 175 TWh. Combined heat and power, wind and nuclear power generation is expected to increase. Electricity usage is estimated to be 152 TWh.

In 2001, the network companies made a voluntary undertaking to weather-proof all unisolated cables through forests, 57 000 km in total. The severe storm in January 2005 led to an increase in the rate of investment, and by the end of 2006 approximately half of the investments had been carried out. On 1 January 2011, the functional requirements of the Electricity Act came into force. During 2011, thousands of customers suffered long electricity outages caused by the storm Berta, which affected southern Sweden. The events have been audited by the EI and five network companies have been ordered to carry out measures.

Several public authorities monitor the electricity markets

Several public authorities and bodies collaborate in monitoring the Swedish and Nordic electricity market in order to create a well-functioning electricity market and prevent the exercise of market power.

The Inspectorate has overall responsibility for the Swedish electricity market and the implementation of the Electricity Act and the Act on Certain Pipelines. The Swedish Competition Authority is responsible for implementing the competition regulations. The Swedish Financial Supervisory Authority exercises supervision of the Swedish actors operating on the financial electricity market with permission from the Authority. The Swedish Consumer Agency participates in the monitoring of the electricity market, for example in the development of industry-wide general terms and conditions of contract with the aim of safeguarding reasonable contract terms for consumers on the electricity market. Within Nord Pool Spot and Nasdaq OMX, trading is monitored, as are the actions of companies. Nord Pool Spot, which has its registered office in Norway, is monitored by Norwegian regulatory authorities, namely the Norges vassdrags- og energidirektorat and the Financial Supervisory Authority of Norway.

A fundamental requirement for an effective, competitive market is that all the actors on the market have simultaneous access to all information affecting the market. The actors' trust in the market is affected negatively in the event

a number of actors have information advantages. The potential information symmetry can skew competitive relations to the advantage of actors who are vertically integrated. It is therefore important that the system that supplies market information is developed in such a way that all information affecting the market is received simultaneously by all market actors, and in an efficient way.

Since spring 2011, there is a so-called insight council within Nord Pool Spot. The council includes representatives of the regulatory authorities in Sweden, Finland, Norway, Denmark and Estonia, as well as the management of Nord Pool Spot. Sweden is represented by the Energy Markets Inspectorate. One of the tasks of the council is to provide the Nordic regulatory authorities with better insight into the bidding on Nord Pool Spot.

The natural gas market

As opposed to natural gas network operations, trading in natural gas is exposed to competition. The trading has gradually been transformed from local monopolies to becoming totally competitive. The final step in opening up the market was taken on 1 July 2007, when the natural gas markets in most EU countries were entirely opened up to competition. The market reform means that all of Sweden's natural gas customers can choose their natural gas supplier entirely freely. Approximately 3.5 % of Sweden's energy needs are covered by natural gas.

No Swedish natural gas extraction

Sweden does not extract any natural gas. All natural gas consumed in the country is imported via the pipeline that stretches between Denmark and Sweden. From Denmark, there are pipelines going to the continent as well, which means that Sweden is linked to the continental system.

Two companies, E.ON Sweden and Dong Energy, sell natural gas on the Swedish wholesale market. Dong Energy is 73 % owned by the Danish government, and E.ON Sweden is owned by E.ON AG, which is the world's largest privately owned energy company. Information about the companies' existing market share is missing, but there is nothing to indicate that any major changes have occurred since 2006. During 2006, E.ON sold around 5.3 TWh on the wholesale market. This gives a market share of 48 %. However, this figure does not take into consideration that part of this volume is sold to companies within the E.ON group, which in turn have sold the natural gas on to end users.

Few natural gas suppliers and limited customer activity

There are around 37 000 users of natural gas in Sweden, of which 3 600 are company customers and the rest household customers. The trade in gas includes sales both to businesses and to individual consumers. The number of end users has fallen in recent years. The reduction is primarily due to the

number of customers using gas for cooking has fallen in Göteborg and Malmö. During 2011, five natural gas suppliers operated on the Swedish natural gas market. The three largest natural gas suppliers, E.ON, Dong Energy and Göteborg Energi, had just under 85 % of the market in 2011.

The total cost of natural gas for households can be divided up into gas supply price, network fee and also energy tax and VAT. In 2011, the gas supply price for a household customer made up 24 % of the total cost of natural gas, compared to 18 % one year earlier. The network fee made up 42 %, while energy tax and VAT together represented 34 %. The total cost of natural gas for a household in 2011 amounted to SEK 1.11 per kWh for a household with gas heating, or just over SEK 5 000 for the year.

During 2011, 281 households switched natural gas suppliers, which is an increase of 6 % compared to the previous year. However, the number of switches remains at a low level, and corresponds to almost 1 % of the total number of household customers.

New method for auditing gas network fees

The Swedish Energy Markets Inspectorate exercises supervision over the gas network companies and approves the methods used by the companies to calculate their network fees. The Inspectorate's advance audit of the methods on which the design of the fees are based is aimed at ensuring that they are objective and non-discriminatory in accordance with the requirements in the Natural Gas Act. Auditing the reasonability of the network fees is currently carried out in arrears. The Inspectorate has proposed changes to the Natural Gas Act and methods for ex ante regulation of gas network tariffs. The legislation is expected to come into force in 2013.

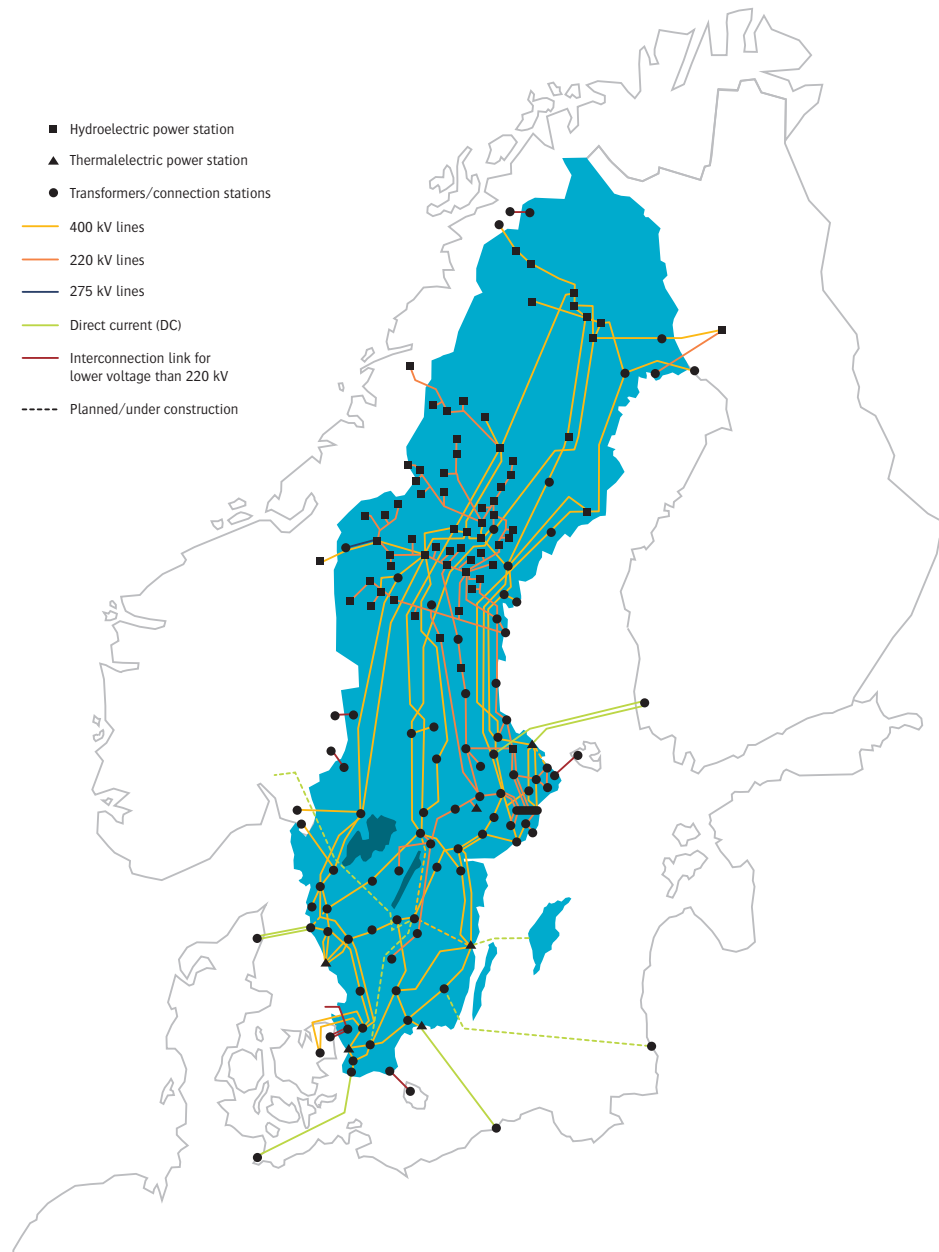
The Swedish electricity market was deregulated in 1996, since when electricity trading and generation have been open to competition, while network operations are a regulated monopoly. The purpose of opening up generation of and trade in electricity to competition was to increase choice for consumers and to create prerequisites for efficient use of production resources. The electricity networks are operated as a monopoly, as it would be both socio-economically and environmentally unsuitable to build parallel electricity networks throughout the entire country.

The electricity market

The electricity network

The Swedish electricity network consists of 538 000 kilometres of conductors, of which 320 000 kilometres are underground cables and 218 000 kilometres are overhead lines. The electricity network can be divided up into three levels: the national network, the regional networks and the local networks. The national network transports electricity over long distances at high voltage levels. The regional networks transport electricity from the national network to the local networks and, in some cases, direct to major electricity users. The local networks are linked to the regional networks and transport electricity to households and other end users. The state-owned Svenska Kraftnät is responsible for maintaining the power balance and operational security of the Swedish electricity network system. The local and regional network companies are responsible for ensuring an adequate level of network maintenance in order to guarantee that security of supply is maintained within their own networks. During 2011, five companies operated regional networks and 171 companies local networks in Sweden.

Figure 1. The Swedish national network



Source: The Swedish Energy Markets Inspectorate based on a illustration published by Svenska Kraftnät entitled "Electricity Network in Nordic countries 2011"

Transmission limitations lead to Nordic sub-markets

The need to transmit electric power within Sweden and the Nordic area is affected primarily by the availability of hydroelectric power as well as seasonal variations in consumption. However, the power network in the Nordic area has certain limitations in its transmission capacity. Transmission limitations within the Swedish national grid are usually associated with a high level of hydroelectric power generation in the north, which results in a major need to transmit power southwards. Transmission limitations also occur when there is a high level of northwards transmission from Denmark and the rest of Europe to the Swedish west coast and then on to southern Norway.

According to the EU's regulatory framework, market-based methods shall be used to manage transmission limitations. Two methods are mainly used in the Nordic countries: Counter trading and market splitting.

Counter trading entails Svenska Kraftnät ordering increased electricity generation in the shortfall area and/or reduced electricity generation in the surplus area. These costs, so-called counter trading costs, are charged to Svenska Kraftnät and in this way provide signals that the network needs reinforcing. During 2011, counter trading costs amounted to SEK 132 million, which is an increase of SEK 88 million compared to last year.

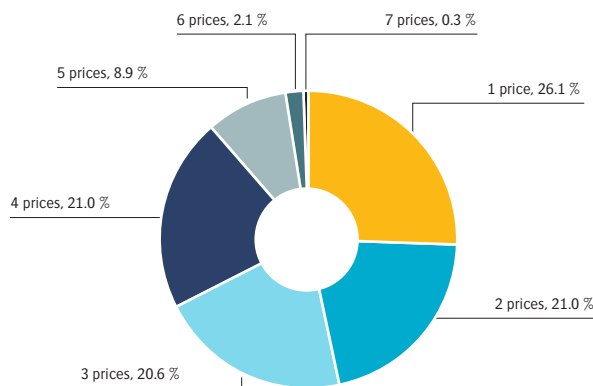
Market splitting entails temporary division of the electricity market into sub-markets, with differential electricity prices adapted to the transmission capacities between the sub-markets. During periods when the transmission capacity is insufficient to satisfy the market's demand for transmission, smaller sub-markets arise on the Nordic electricity market. As a result of the transmission limitations within the Nordic countries, Nord Pool Spot has divided up the Nordic electricity market into electricity areas, also called spot price areas or bidding areas. The prices within the individual areas are determined by production and consumption within each area, and by transmission of power to and from the area.

As from 1 November 2011, Sweden consists of four fixed bidding areas on the spot market. This is a result of the EU Commission deciding on 14 April 2010 that Sweden must change its way of managing transmission limitations in the Swedish electricity network. The most common price areas within Nord Pool Spot are Luleå, Sundsvall, Stockholm, Malmö, Finland, eastern Denmark, western Denmark, northern Norway, central Norway and southern Norway. During periods with significant transmission limitations, Norway may be divided up into further price areas.

During 2011, the Nordic countries had a common electricity price during 26 % of the time, see Figure 2. This is an increase of just over 8 percentage points compared to 2010, when the electricity price was common

during 18 % of the time. The increase is due to normalised hydrological balance, slightly greater availability of nuclear power and reduced demand for electricity in the Nordic countries.

Figure 2. Proportion of the time the Nordic countries have had one or several bidding area prices during 2011



Source: The Swedish Energy Markets Inspectorate

When bidding areas were introduced in Sweden, large price differentials initially arose between SE4 and other Swedish bidding areas. The price differentials were largely caused by the introduction coinciding with falling temperatures, and by all reactors at Ringhals being out of commission. Closer to the year-end, the price differentials were considerably smaller once Swedish nuclear power generation had increased and the transmission link between SE3 (Stockholm) and Finland had been restored to full capacity again. As expected in advance, prices in SE4 (Malmö) were largely identical to those in DK2 (western Denmark).

Development of Sweden's electricity network fees

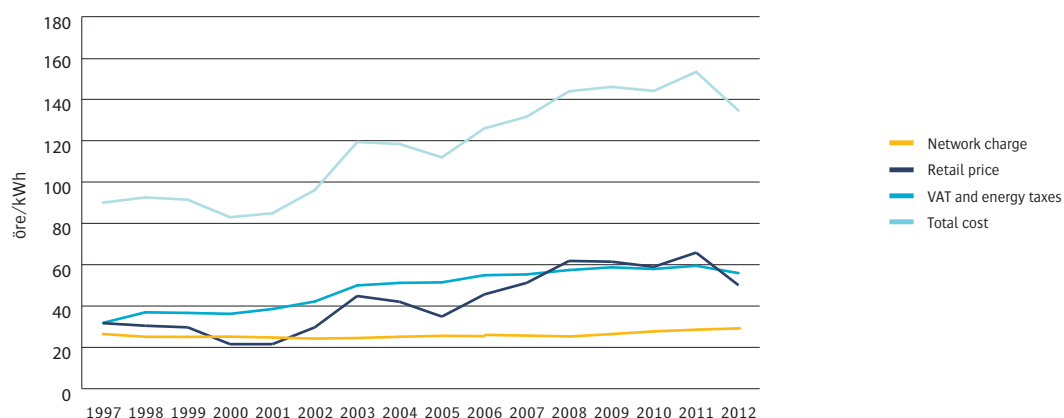
The Swedish electricity network is operated as a regulated monopoly, where the EI audits the network operators' incomes and assess whether these are reasonable. The network fees of around twenty customer groups are collated, in order simply to compare the network fees of the various network operators. According to the Electricity Act, the network operators are entitled to charge for operation and maintenance, and a reasonable return on the operation's capital. The companies are expected to make their operation more efficient and offer good supply quality.

The network fee usually consists of a fixed part and a variable part. For single-family houses with electric heating, the fixed part constitutes just over half the network fee on average. The variable part of the network fee can be affected by the consumer through the amount consumed. Figure 3¹, with

¹The average value converted into 2012 prices, unweighted.

data from customers with 20 A fuses and consumption of 20 000 kWh per year, shows that the network fee has developed in a stable way since 1997. Price variations due to electricity trading and tax have had the greatest impact on total consumer electricity price². The network fee also includes public authority fees and fees for transmission to overriding networks, that is regional networks and the national grid.

Figure 3. Changes to the combined electricity costs for a single-family house with a 20 A fuse and consumption of 20 000 kWh/year



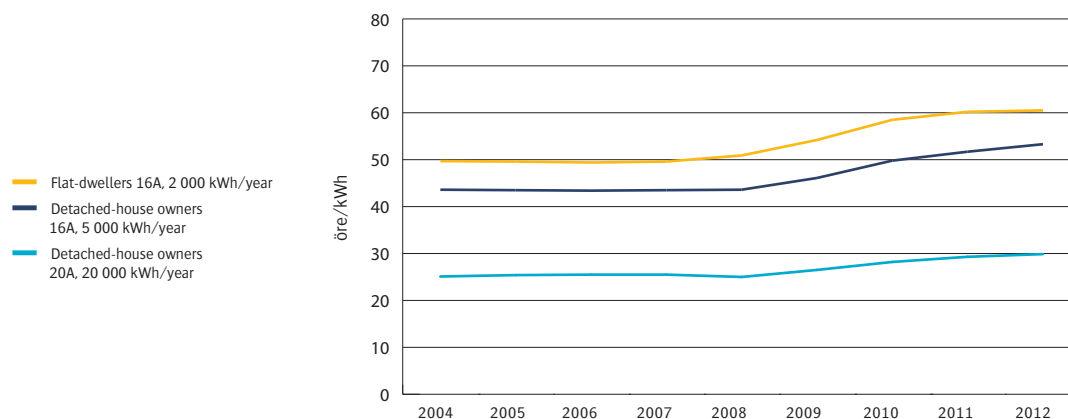
Source: The Swedish Energy Markets Inspectorate

The development of network fees for household customers was relatively stable between 2004 and 2008, see Figure 4³. After 2008, fees rose until 2010, but during the last two years the rate of increase has declined. The average network fee as of 1 January 2012 amounted to SEK 0.605 per kWh for customers in flats, SEK 0.533 per kWh for customers in single-family houses with 16 A fuses and SEK 0.299 per kWh for customers in single-family houses with 20 A fuses. Fee increases during last year amounted to 0.4 % for customers in flats, 3.1 % for customers in single-family houses with 16 A fuses and 1.9 % for customers in single-family houses with 20 A fuses. Counted in SEK, the increase corresponds to SEK 5, SEK 8 and SEK 111 per year respectively.

² Up to and including 2009, the electricity trading price was based on one-year agreements as of 1 January each year. As from 2010, a monthly average from Elpriskollen is used for one-year agreements in January.

³ Figure 4 is calculated on the average value converted into 2012 prices, weighted by the number of low-voltage contracts per accounting unit.

Figure 4. Actual development of network fees for household customers



Source: The Swedish Energy Markets Inspectorate

Customers with low electricity consumption have fewer tariff alternatives than customers with high electricity consumption. Most network companies only offer one tariff type, single tariff, to minor customers. The single tariff means that the customer pays the same, irrespective of when during the 24 hours the electricity is consumed. The alternative to single tariff is time tariff. The customer then pays a variable cost, depending on when the electricity is consumed. The price is usually lower at night than during daytime.

Some network companies have introduced effect-based tariffs for household customers. The network tariff then consists of a smaller fixed price, linked to the size of the fuse. The size of the fuse determines the maximum possible power use. In addition, an effect fee is charged, depending on how the household uses the electricity network. The network tariff is differentiated within a given fuse rating, and differential prices may be used, both at different times of day and also at different times of year.

New mapping of local network tariffs

The Inspectorate is responsible for monitoring how the network companies structure their tariffs, and thus how costs are allocated among customers. With the aim of further mapping and analysing the structure of the network tariffs used in Sweden, in 2011 the EI commissioned the consultancy company Sweco to carry out an analysis of the local network tariffs of Swedish network companies. The analysis shows great variation, with some network companies using fixed pricing, while others choose to use a form of pricing using only energy and/or effect-dependent tariff components. However, the result shows that the network companies in general use the same basic principle – “the customer shall bear the costs it gives rise to” – when allocating costs across the customer collective, and where each cost category (fixed, effect-dependent, energy-dependent) are reflected in a tariff component of equivalent size.

The interviews also show that the network companies, when structuring tariffs, take into account factors such as simplicity, financial risk and the opportunity to create incentives for energy saving and changed consumption patterns to different degrees, which to some extent leads to divergences from the basic principle of fair cost. This, together with varying prerequisites (geographic location, the composition of the customer collective, etc.) explains the variation that exists in relation to how the network companies choose to implement fixed and variable price components respectively. The conclusion is therefore that the network companies work in such a way that price discrimination – given the objective prerequisites of the operation – are minimised.

New method for auditing network fees

As from 1 January 2012, the EI assesses the network companies' network fees in advance, in accordance with the new provisions of Chapter 5 of the Electricity Act (1997:857). The new supervisory model means that the EI will decide in advance on the volume of income that the companies may be permitted to earn during a four-year period. The income shall cover reasonable costs of operating the network during the period and provide a fair return on the capital invested. The quality of the manner in which the companies undertake their operations will also be taken into consideration.

The method is used to calculate the capital cost, day-to-day operating cost and the quality of the network operation during a monitoring period. The purpose of this supervisory model is both to ensure the companies' customers are charged predictable fees, and also to enable the companies to invest and maintain the networks.

At the end of March 2011, the network companies applied for an income framework together with the information the companies considered that the EI would need access to in order to make a decision about an income framework. The first supervisory period runs between the years 2012 and 2015. A few network companies have been given a one-year supervisory period. At the end of October 2011, the EI decided on 179 income frameworks for Sweden's local and regional network companies. With this decision, the EI has determined the level of income the network companies may charge at most from its customers for network transmission during this supervisory period.

The companies together applied for income frameworks totalling around SEK 183 billion, and the EI decided to award income frameworks worth around SEK 150 billion for all network companies together. In its assessment, the EI has evaluated both the cost increases that are reasonable, and also what a fair return is on the capital tied up in Sweden's electricity networks. The standard method developed by EI represents what the network companies would require in the long term in order to maintain good quality within the electricity network. In the short term, however, there is a need to

level out the permitted income increases in order to safeguard the consumers' interest in a stable development of the fees. EI therefore decided to implement a transfer period of four supervisory periods. The result is that the network companies may increase their fees by 2 % per year on average, excluding inflation. Variations are great, however. The permitted increases are between around 1 % up to 8 %. Just over half of the 180 network companies have appealed the EI's decision to the Administrative Court in Linköping.

Audit of the 2010 network fees

Up until the new advance regulation of the network companies' income came into force, the fees of the network companies were audited in arrears. The fairness assessment of the 2010 network fees were carried out according to the following steps.

Step 1

Each year, the network companies make separate financial and technical reports for the network operation seven months following the end of the financial year. In March 2011, the network companies submitted proposals for an income framework for the supervisory period 2012-2015 and the information required to determine the income framework. The information reported is audited for quality, and supplemented as required.

Step 2

On the basis of the information in the separate reports, information received in conjunction with the companies' proposals for income frameworks and values set by the EI (factor price index and forecast interest rate), an individual calculation is made in which the companies' income is compared with the development in actual costs for overriding networks, network losses and fees charged by authorities, as well as estimated day-to-day costs that can be influenced, and also capital costs.

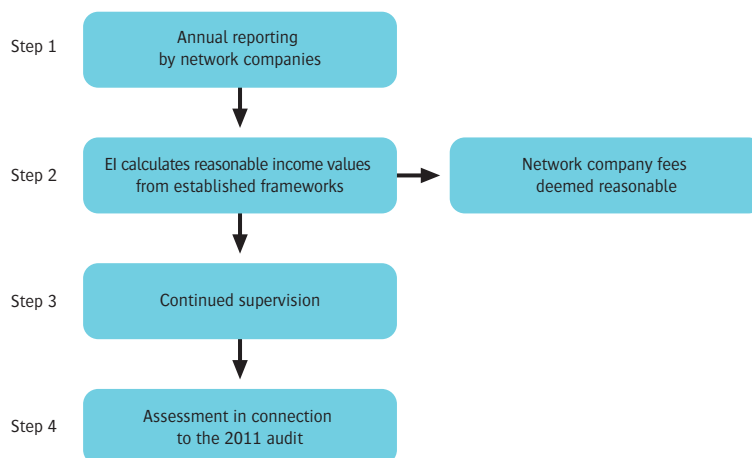
Step 3

In those cases where the EI finds that the actual income for 2010 is higher for an individual company than EI finds reasonable, the EI will inform the company in question that it will be subject to continued supervision for the financial year 2011 in accordance with Chapter 12 Section 3 of the Electricity Act.

Step 4

The EI intends to carry out an overall assessment of network fees for the years 2008-2011 following the assessment of the network companies' fees for 2011. This might in some cases result in decisions to adjust the network fees.

Figure 5. Overview of the EI's annual audit of network fees



Source: The Swedish Energy Markets Inspectorate

The 2010 audit covered all 171 network companies. It was the EI's decision that the majority of the network companies in the country charged a fair return in relation to the limits set by the EI. In total, 48 network companies have been notified of continued supervision of the network charges in accordance with Chapter 12 Section 3 a of the Electricity Act. These companies have been notified about continued supervision due to the following reasons:

- Four accounting units could not be audited due to their decision to co-report, which meant the EI lacked the information required for the audit.
- Three accounting units had non-conforming financial years, which meant that the data for the 2010 operation had not been received by the EI at the time the audit was carried out.
- The remaining 41 network companies have had actual incomes during 2010 which exceeded the approved level according to the current regulatory model.

During 2012, the EI will audit the network companies' fees for 2011. Then the audit of the 2010 network fees will also be completed for the companies that were notified about continued supervision.

Once the fairness assessment of the 2011 network fees is completed, the EI intends to make an overall assessment of the results for the years 2008-2011 for the companies notified about continued supervision. Thereafter an assessment will be made about any adjustment of the network fees.

More information about the audit of the network companies network fees for 2010 can be found in the EI's annual audit of the local network companies' fees, "EI R2011:12 Bedömning av elnätföretagens nätavgifter 2010".

EI supervises the transmission systemoperator

Svenska Kraftnät operates the Swedish national grid. Svenska Kraftnät is also the authority with system responsibility for the Swedish electricity network. Svenska Kraftnät is mandated to manage, operate and develop a cost-effective, operationally secure and environmentally adapted power transmission system in a business-like manner, to sell transmission capacity and otherwise carry on operations linked to the power transmission system. According to the Electricity Market Directive, EI in its capacity as regulatory authority has the mandate to audit Svenska Kraftnät. The supervision of Svenska Kraftnät for 2011 has consisted partly of EI requesting various information from Svenska Kraftnät and also of setting an income framework for Svenska Kraftnät for the 2012 supervisory period. The EI has also decided to approve the methods for the balancing responsibility agreements within electricity and gas.

Svenska Kraftnät's reporting of the information requested by the EI related to tariff setting, return requirements, operational disruptions and capacity income. The EI had no comments on the information supplied by Svenska Kraftnät. Nor did the information give rise to any occasion for the EI to carry out any further measure within the framework for its supervision.

As from 1 January 2012, the income of Svenska Kraftnät shall be set in advance, as for all other network companies. For Svenska Kraftnät, the supervisory period is one calendar year, while for the other network companies it is usually four calendar years. In February 2011, Svenska Kraftnät submitted a proposal for an income framework to the EI. According to the law as applicable at the time, the EI should prepare a proposal for an income framework for Svenska Kraftnät, on which the Government would then decide. The decision about the income framework was made by the Government on 8 September 2011, to come into force on 1 January 2012.

Transmission limitations generate bottleneck revenues

Transmission limitations (bottlenecks) among different bidding areas give rise to what are termed bottleneck revenues on account of price differences among different areas, either within Sweden (internal bottleneck revenues) or between a Swedish bidding area and a bidding area in other country (external bottleneck revenues). The EU regulatory framework only covers the external bottleneck revenues. When the market is divided into bidding areas, the bottleneck revenues for any particular hour are made up of the price difference between a high- and a low-bidding area multiplied by the volume transmitted.

In accordance with the regulation on cross-border exchanges of electricity⁴, Svenska Kraftnät, together with other Nordic transmission system operators, has decided to use the revenues from handling bottlenecks for investments designed to strengthen grids and connections between the countries. Svenska Kraftnät reported bottleneck revenues of around SEK 313 million for 2011⁵. The EI considers that these revenues have been used for purposes permitted in the regulation. The EI⁶ has also approved Svenska Kraftnät to use external bottleneck revenues up to an amount of at most SEK 300 million, provided the bidding area risk exceeds SEK 50 million, in order to reduce the grid tariff for 2012.

Certification of transmission system operator on the electricity market

According to Article 10 of the Electricity Market Directive, those responsible for the systems in the transmission systems shall be certified. On 9 June 2011, a Swedish enactment on certification of transmission system operators was issued, and came into force on 1 August 2011.

An application for certification from Svenska Kraftnät was received by the EI on 26 August 2011 and supplementary appendices dated 12 December 2011. The EU made its preliminary decision on 1 March 2012. The preliminary decision was reported to the European Commission on 8 March 2012. The Commission issued its statement on the preliminary decision on 30 April 2012, and this was received by the EI on 14 May 2012. From this date, the EI has two months in which to make a final decision.

Security of supply in the electricity network

High-voltage electricity cables may not be installed without a permit, a so-called network concession. Network concessions are granted by the EI, or by the Government for overseas links or links in the national grid.

Security of supply is affected by the type of links used. The proportion of underground cables in the local networks has increased in order to weather-proof the electricity networks. However, there are risks of longer outages attached to underground cables in radial networks, which can be severed in the event of excavations or building operations. In overhead line networks, insulated lines are more robust than uninsulated ones. Of the total length of lines in low-voltage networks, around 97 % is insulated or laid under ground in 2011, while in the case of lines at medium- and high-voltage levels this figure is around 58 %⁷.

According to the Electricity Act, electricity users whose transmission of electricity is interrupted for at least 12 hours are entitled to compensation from the network company to which the user is connected. The requirement applies for outages that fall within the control responsibility of the network owner. The compensation is standardised, and shall be paid out automatically. The Electricity Act also regulates the right to damages from the electricity network

⁴Regulation (EC) No 714/2009 of the European Parliament and of the Council of date 13 July 2009 on conditions for access to the network for crossborder exchanges in electricity and revoking Regulation (EC) No 1228/2003.

⁵According to the Congestion Management Guidelines relating to EC Regulation 714/2009 on conditions for access to networks for cross-border exchanges in electricity, the EI shall account no later than 31 July every year for the bottleneck revenues received by Svenska Kraftnät and provide a specification of how they have been spent.

⁶EI decision 770-11-102237.

⁷According to the information for 2010.

company in the event of personal injury, property damage or economic loss. In 2007, the Swedish Energy Markets Inspectorate issued instructions on the manner in which a network owner shall inform his customers about the outage compensation rules of the Electricity Act.

In November 2007, the EI issued instructions on the obligation of the electricity network companies to report outages in accordance with the provisions⁸ of the Electricity Act. These instructions were revised in 2010 in order to take into account such matters as the new ex ante regulation of network tariffs. From 2011, annual detailed outage reporting will be undertaken at customer level in respect of both short and long outages. Lengthy and extensive outages are to be reported on an ongoing basis to the EI with effect from 1 January 2008.

The purpose of such reporting is to enable assessment by the EI of the quality of supply in the electricity networks, as well as timely intervention should the measures taken fail to ensure this in a specific network. This assessment also serves as the basis for evaluating the fairness of network fees. Table 1 show outages in the local networks between 2000 and 2010⁹. The figures state average values per customer and are divided into notified and unnotified outages.

Table 1. Outages in the local networks due to internal network faults, average values per customer

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average number of outages per customer											
Notified outages	0.19	0.18	0.25	0.19	0.19	0.21	0.19	0.31	0.50	0.22	0.14
Unnotified outages	0.88	1.03	0.97	0.90	0.89	1.26	1.05	1.49	1.04	0.88	1.03
Average outage time per customer (min)											
Notified outages	27	27	29	27	25	32	22	22	26	20	20
Unnotified outages	89	128	123	118	72	890	88	307	104	63	71

Source: The Swedish Energy Markets Inspectorate

In 2011, then network companies made a voluntary undertaking to weatherproof all unisolated cables through forests, 57 000 km in total. The severe storm in January 2005 led to an increase in the rate of investment, and by the end of 2006 approximately half of the investments had been carried out. On 1 January 2011, the functional requirements¹⁰ of the Electricity Act came into force. During 2011, thousands of customers suffered long electricity outages caused by the storm Berta, which affected southern Sweden. The events have been audited by the EI and five network companies have been ordered to carry out measures.

Table 1 also shows information about outages in the transmission of electricity for reasons of electricity safety or in order to carry out measures or repairs

⁸ EIFS 2011:1, EIFS 2011:2 and EIFS 2011:3.

⁹ Most recent available figures.

¹⁰In 2005, the Riksdag introduced a functional requirement stipulating that electricity outages may not exceed 24 hours. The requirement applies as from 2011 for events within the network owner's so-called control responsibility.

aimed at maintaining food operational and supply security (notified outages, both numbers and periods). According to the Electricity Act, the outage may not in any case continue for longer than the measure requires. Consumers shall also be notified in good time before the outage in person, or if suitable, by means of a poster.

With effect from 1 January 2006, the electricity network companies have been obliged in accordance with the Electricity Act to undertake risk and vulnerability analyses and also to draw up action plans describing how the security of supply of their own networks will be improved. These provisions aim to reduce network vulnerability and to facilitate compliance with the functional requirements of the Electricity Act. Risk and vulnerability analyses and action plans must be submitted to the EI, which in 2010 issued instructions on the annual reporting of risk and vulnerability analyses in the networks.

The EI has decided on instructions regarding the requirements that are to be fulfilled in order for the transmission of electricity to be of good quality in accordance with the requirements of the Electricity Act. Parts of the instructions relating to technical requirements with respect to the requirement for tree safety management for regional network lines and the functional requirement for high load levels were issued in the middle of 2010, while those dealing with voltage quality were issued in the middle of 2011. During 2012, the instructions will be supplemented by guidelines for the number of outages at individual customer level.

Continued work towards increased European harmonisation

According to the Electricity Market Directive, the regulatory authorities have an obligation to monitor how the access to cross-border infrastructure is handled by those responsible for the system. This obligation is part of the general supervisory responsibility of the regulatory authorities in accordance with the Electricity Act. The common Nordic market is well established, which means that it is primarily changes that require the attention of the regulatory authorities. The EI is working actively together with the other Nordic regulatory authorities to ensure internal rules and practices in the Nordic countries develop in the direction towards increased harmonisation.

According to the Electricity Act, network tariffs for transmission of electricity shall be designed in such a way that payment of a connection fee shall give the right to use the electricity network within the country, with the exception of the overseas links. However, the Government may also prescribe that payment of a connection fee shall also give the right to use the overseas links to one or more countries. Such decisions have already been taken by the Government in relation to the links between Sweden and the other Nordic countries and, as from 2012, in relation to the links between Sweden and Poland and Sweden and Germany respectively. The allocation of all links is

done through implicit auctions via Nord Pool Spot, or the European Market Coupling Company (EMCC). The Nordic market is also linked to France, Luxemburg, the Netherlands and Belgium via the EMCC. As all available transmission capacity is allocated in this way, there are no special auctions for explicit allocation of capacity. The EI and the other regulatory authorities involved are, however, investigating the need and prerequisites for introducing financial transmission rights as an instrument for safeguarding price differentials between different price areas on the linked electricity market. In terms of the internal Nordic market, the Nordic regulatory authorities within NordREG have drawn the conclusion that such instruments would not add any significant benefits to the market, and that they should therefore not be introduced. When it comes to the links between Sweden and Poland and Sweden and Germany respectively, changes in ownership are taking place. For these links, bilateral discussions will be started with each regulatory authority once the ownership situation of the cables in question has been clarified.

Within the framework for the European work towards an internal European market for electricity, considerable development work is in progress. A pilot project is in progress between the Nordic countries, Germany, France, Luxemburg, the Netherlands and Belgium concerning linking the prices on all the markets affected. It shall be possible to expand this link to all European countries. The work, which is carried out by the operators with system responsibility and the relevant electricity markets, is monitored by the national regulatory authorities under the leadership of the German and Danish regulatory authorities. The EI is participating actively in this work. An important part of the work consists of ensuring that the changes impacting on Swedish and Nordic actors are commensurate with a well-functioning market in the Nordic countries.

The same constellation of countries are also working with widening the opportunities for cross-border intra-day trading, according to the model for so-called continuous trading corresponding to the trading that occurs in the Nordic countries sometimes via Elbas. This trade too will become pan-European. However, considerable methodology development is required in order to cover the needs that exist on the continent for features such as OTC trading. Intra-day trading will also be introduced to the link to Poland as soon as the prerequisites are present.

Joint Nordic balance regulation

In Sweden, there is no independent operator with system responsibility. For this reason, the provisions governing supervision of independent operators with system responsibility are not applicable to the EI. For around ten years,

balance regulation within the Nordic area is handled jointly by the Nordic operators with system responsibility, which means that balance regulation is handled as if the Nordic synchronised area constituted a single control area. However, this is done with retained responsibility for each operator with system responsibility. There is also a common market for balance power, where the most effective resources in all of the Nordic countries are used for upward and downward regulation. Common principles for balance settlement were introduced in 2009. Currently, work is in progress to facilitate common balance settlement in the Nordic countries, as part of the joint end-customer market. Preparations are also in progress among the operators with system responsibility to create a common market for automatic reserves in order to maintain frequency. Because of the joint character, the Nordic regulatory authorities are monitoring the changes being made, and reach a joint decision whether the change should be introduced. Thereafter, national decisions are made. EI normally decides on changes by approving changes to the general balance agreement between Svenska Kraftnät and the companies with balance responsibility. During 2011-2012, work is in progress within ACER in order to produce new framework guidelines for a common European balance market. The EI is participating actively in this work. These framework guidelines will form the basis for so-called network codes, which are being produced by the organisation of European bodies with network responsibility, ENTSO-E.

The Nordic operators with system responsibility have long managed excess loads jointly through implicit auctions via the Nordic electricity market place Nord Pool Spot. The methods for calculating available capacity that can be offered on the market for these implicit auctions and for announcing these shall be public, and changes to these methods shall be approved by the regulatory authority. Within the Nordic cooperation within NordREG, discussion is currently in progress whether the current methods for calculating capacity are satisfactory, or whether any changes should be introduced.

Cross-border cooperation

The EI cooperates across borders in several cooperation bodies: cooperation with the other Nordic regulatory authorities within the framework for NordREG and with the Nordic as well as German and Polish regulatory authorities within the framework for cooperation in Region Northern Europe. Currently, intensive cooperation within the so-called Region NWE, consisting of Region Northern Europe, Region CWE (consisting of Germany, France, the Netherlands, Luxemburg and Belgium) and also Great Britain. The purpose of the cooperation is to achieve a single price-linking procedure for all European trade in electricity. The cooperation shall gradually be widened to include the whole of Europe.

An important prerequisite for a common market is that there are common rules for how electricity is to be transmitted and handled between member countries in a safe, efficient and economic manner. No least must the function in purely technical terms of the transfer of electricity between the countries' national grids be safeguarded. Within the EU's body for regulation of the energy market, ACER, the EI has worked on the development of Framework Guidelines in accordance with the process established for developing European regulatory frameworks for a common European market for electricity.

The wholesale power market

The Swedish wholesale power market is part of an integrated Nordic power market. Sweden, Norway, Denmark and Finland are all linked with transmission links for electricity. The Nordic network is, in turn, linked to the European electricity network. On the Nord Pool electricity exchange, electricity is bought and sold among generators and buyers in all the Nordic countries. The operational management of the electricity network is carried out within each country, where the operator with system responsibility makes sure the national electricity network is always in balance.

Electricity generation in Sweden is mainly based on nuclear and hydroelectric power plants. In a normal year these two power sources account for around 90 % of the total national electricity generation.

Trading on Nord Pool Spot and Nasdaq OMX

Trading in physical electricity contracts is organised on Nord Pool Spot. The physical market includes Elspot and Elbas. Elspot is a 24 hour market for short-term trading of physical electricity contracts. Elspot sets the system price and the spot prices 24 hours in advance for every hour of the coming 24 hours. The system price is an equilibrium price, based on the overall buying and selling bids in the area. Elbas is a physical adjustment market for continuous trading in hourly contracts in the Nordic countries, Germany and Estonia. Trading may occur up to one hour before delivery, during all 24 hours of the day and night.

High turnover on Nord Pool Spot means good liquidity and well-functioning market trading, which contributes to the actors' trust in well-functioning price formation. Only a small part of the electricity generated in the Nordic countries is sold through so-called OTC¹¹ contracts, which are bilateral agreements. Nord Pool Spot's market share of total consumption in the market area was between 70 and 75 %. The total traded volume fell slightly in comparison with the previous year, from 307 TWh in 2010 to 297 TWh in 2011, largely due to reduced electricity consumption in the Nordic countries. The number of actors on Nord Pool Spot's markets amounted to 336 in January 2012. 326 actors trade on Elspot and 105 actors on Elbas. Almost all electricity generated in Sweden is sold via Nord Pool Spot.

The financial trading on the Nordic electricity market is carried out on Nasdaq OMX. The financial electricity market facilitates risk management for buyers and sellers by offering long-term contracts and hedging opportunities. Contracts are available with durations of days, weeks, months, quarters and years, with a maximum validity of up to 6 years. The financial contracts on

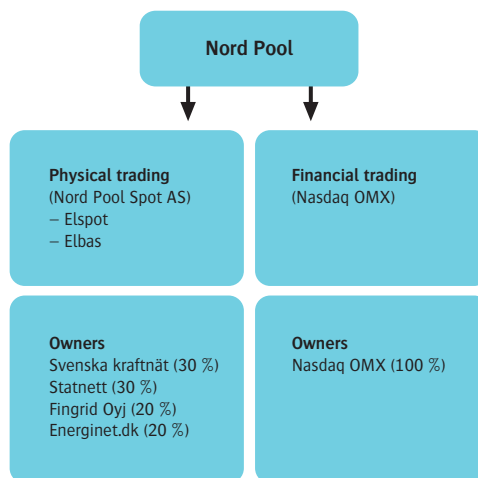
¹¹ "over the counter"

the market are based on the price on the spot market, which functions as the reference price. There is also trading in emission rights on Nasdaq OMX.

The total turnover on the electricity market is dominated by the financial market. Financial trading fell compared to 2010, and amounted to 1747 TWh. On Nasdaq OMX's financial market for the Nordic market, the number of actors amounted to 356 in December 2011, which is an increase of 15 compared to 2010.

Nord Pool Spot AS is owned jointly by the Nordic system operators. The financial operation was sold in April 2010 by Svenska Kraftnät and Statnett SF to Nasdaq OMX, and then changed its name from Nord Pool AS to Nasdaq OMX Commodities. The reason for this separation was that Svenska Kraftnät did not consider that the operation of a financial market place lay within the framework for its core business.

Figure 6. Organisation and owners of Nord Pool



Source: Nord Pool Spot

Large price variations during 2011

The price formation on the spot market is driven by a number of different factors; some interact, while others are counter-productive. Even if the price formation on all markets to some extent are influenced by the actors' expectations for the future, the price development on Nord Pool Spot can largely be explained by fundamental facts, such as variations in precipitation, wind and temperature.

The price development during 2011 was characterised by large price variations. Prices during the first six months of last year were clearly above average, as a result of very low rainfall, late spring floods and relatively low availability of nuclear power. The system price during the first six months of 2011 reached more than SEK 0.70 per kWh. A wet summer and autumn contributed to monthly average prices falling during the second half of the year. The shortfall in water storage of 30 TWh which arose during spring turned into a surplus of 10 TWh during autumn. Prices during the second half of 2011 fell to an average of SEK 0.25 per kWh. The average spot price in Sweden for the whole year was just above SEK 0.42 per kWh, which is a reduction of 16 % compared to 2010.

Figure 7. Nord Pool Spot system price development 2011



Source: Nord Pool Spot

Increased Swedish electricity production and reduced electricity use during 2011

During 2011, total electricity production in Sweden amounted to around 147 TWh, an increase of just over 1.4 % compared to 2010, as shown in Table 2. Nuclear generation increased by just over 4.3 % compared to the previous year. Hydroelectric power generation fell, by 1.2 % compared to 2010, due to it being a dry year with major shortfalls in the reservoirs. Windpower generation increased by almost 75 % compared to the previous year. The gas-fired Öresund plant and other district heating power plant were not operated as intensely during 2011 as during 2010, and combined power and heating generation – simultaneous generation of electricity and heating – fell by almost 12 %.

Table 2. Sweden's electricity balance 2005-2011, TWh

	2005	2006	2007	2008	2009	2010	2011
Domestic generation	155	140.3	145	146	133.7	144.9	146.9
Hydroelectric power	72	61.1	65.5	68.4	65.3	66.8	66.0
Nuclear power	69.8	65	64.3	61.3	50	55.6	58.0
Other heating power	12.3	13.3	13.8	14.3	15.9	19.1	16.8
Wind power	0.9	1	1.4	2	2.5	3.5	6.1
Domestic usage	147.6	146.3	146.3	144.1	138.3	147.1	139.7
Network losses	12.4	11	11.9	11	10.2	11	10.2
Imports	14.6	20.5	18.5	15.6	16.4	17.6	14.8
Exports	-22	-14.4	-17.2	-17.6	-11.7	-15.6	-22
Net exchange	-7.4	6.1	1.3	-2	4.7	2	-7.2

Comment: Negative values denote exports

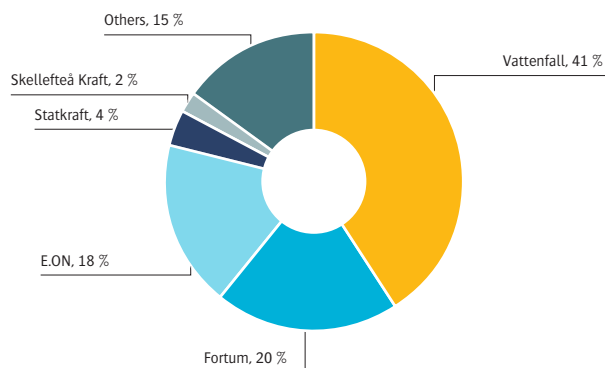
Source: SCB and Svensk Energi

The total electricity consumption in Sweden amounted to 139.7 TWh, which is a reduction compared to last year. Industrial electricity consumption fell by 1.6 % to 52.9 TWh compared to 2010. Household consumption amounted to 36.6 TWh in 2011. Electricity consumption for all contracts together was just over 137.8 TWh in 2011.

Three major Swedish electricity producers

The five largest electricity producers in Sweden accounted for just over 85 % of total generation in 2011, see Figure 8. Vattenfall, E.ON and Fortum together accounted for 80 % of total electricity generation in Sweden in 2011.

Figure 8. The five largest electricity generators in Sweden in 2011



Source: Svensk Energi

Vattenfall is owned by the Swedish state and is the largest Swedish producer of electricity. In 2010, it generated almost 60 % of Sweden's electric power, which was more than the total generation of E.ON Sverige and Fortum Sverige combined. E.ON Sverige is owned by E.ON AG, which is the world's largest privately owned energy company. Fortum Sverige is one of the companies in the Fortum Group, whose parent company is 60 % owned by the Finnish state. Statkraft Sverige is a wholly owned subsidiary of Statkraft, a state-owned Norwegian company. Skellefteå Kraft is a wholly owned municipal company.

In all, the Swedish state, via Vattenfall, owns 39.8 % of the installed generation capacity, foreign actors own 39.6 % and Swedish municipalities 12.5 %, while other categories account for the remaining 8.1 %. Over time, government and municipal ownership has declined in Sweden, but in 2010 municipal and other ownership increased to some degree, while foreign ownership declined somewhat¹².

Improved prerequisites for competition with bidding areas

The division of Sweden into four bidding areas means that Nord Pool Spot's market increased from ten to thirteen bidding areas in 2011. With the introduction of bidding areas, there were also worries that competition on the wholesale market would deteriorate when the bidding areas became smaller. In 2012, the EI therefore carried out a mapping exercise of the consequences of the bidding area reform¹³.

As Table 3 shows, the market concentration in isolated Swedish bidding areas has increased, in particular in SE1 and SE4. At the same time, the EI's study shows that it is extremely unusual for Swedish bidding areas to be entirely isolated and forming their own price areas. SE1 and SE2 have never been isolated, while SE3 was isolated for only 9 hours during the period studied¹⁴. For SE4, the corresponding figure is 35 hours.

Table 3. HHI¹⁵ for isolated Swedish bidding areas

Area	HHI
SE	1989
SE1	6375
SE2	1866
SE3	1956
SE4	2325

Source: The Swedish Energy Markets Inspectorate

When looking at the price areas that have actually been formed, the situation is entirely different than for isolated Swedish bidding areas. Table 4 below shows that the commonly occurring price area constellations are moderately

¹² Source: Svensk Energi.

¹³ Bidding areas in Sweden EI R2012:06

¹⁴ November 2011-march 2012.

¹⁵ The Herfindahl-Hirschman Index, HHI, shows market concentration as the sum of squared shares of individual companies. This means that the index varies from close to zero (but cannot be exactly zero) to 10 000 (if there is only one company).

concentrated or even have low concentration, which indicates that the introduction of bidding areas did not impair the actual competition prerequisites; instead, the more flexible area constellations contribute to good competition prerequisites in these area constellations.

Table 4. HHI for common Nordic area constellations

Area	HHI	Percentage of time
SE4 + DK2	1734	93.6 %
SE3 + SE4 + DK2	1338	78.1 %
SE3 + SE4 + DK2 + FI	958	69.4 %
SE3 + SE4 + DK2 + FI + NO	779	56.1 %
SE1 + SE2 + NO3 + NO4	1913	76.6 %
SE1 + SE2 + NO3 + NO4 + FI	996	69.2 %

Source: The Swedish Energy Markets Inspectorate

In a comparison with the market concentration before the area division, the EI's study showed that the division into bidding areas has entails better competition prerequisites on those occasions when the bidding areas are linked to those of neighbouring countries.

The decommissioning of German nuclear power will impact on the Nordic electricity market

In March 2011, the German government decided to close down eight nuclear reactors with immediate effect. The decision was made under strong political pressure following the serious Japanese nuclear accident in Fukushima. The shutdown of the reactors was a temporary measure lasting three months, during which an in-depth safety analysis of the reactors was to be carried out. At the end of the three months, a decision was made to keep these nuclear power stations shut down, and to begin decommissioning the rest of the nuclear power stations.

It is the EI's assessment¹⁶ that the effects of this new nuclear policy will impact on large parts of Europe – including Sweden. The direct impact on the Nordic countries will probably be small in normal circumstances, but the indirect effects that follow from higher prices on input fuels and emission rights may be considerable, with raised electricity prices the result.

Several public authorities monitor the electricity market

Several public authorities and bodies collaborate in monitoring the Swedish and Nordic electricity market in order to create a well-functioning electricity market and prevent the exercise of market power. The Swedish Energy Markets Inspectorate has overall responsibility for the Swedish electricity

¹⁶ Halvårsrapport om elmarknaden april-september 2011 EI R2011:11

market and the implementation of the Electricity Act and the Act on Certain Pipelines.¹⁷ The Swedish Competition Authority is responsible for implementing the competition regulations. The Swedish Financial Supervisory Authority exercises supervision of the Swedish actors operating on the financial electricity market with permission from the Authority. Within Nord Pool Spot and Nasdaq OMX, trading is monitored, as are the actions of companies. Nord Pool Spot, which has its registered office in Norway, is monitored by Norwegian regulatory authorities, namely the Norwegian Water Resources and Energy Directorate and the Financial Supervisory Authority of Norway.

The Swedish Competition Authority's areas of responsibility and its operations on the electricity market

The Competition Authority is the official body that monitors the companies on the Swedish electricity market to ensure that they do not infringe any of the prohibitions against anti-competitive behaviour in the Competition Act¹⁸ and the EU treaty¹⁹. In response to public or corporate complaints or on its own initiative, the Competition Authority can actively intervene against competition-restricting collaboration among companies and also against companies that abuse their dominant position on the market by exercising market power. The Competition Act also contains rules on monitoring corporate concentrations.

The Competition Authority shall also contribute to effective competition by proposing amended rules and other measures to eliminate existing obstacles to competition. The Swedish Competition Act also includes provisions that prohibit the state, a municipality or a county council, or legal entities over which these have a dominant influence, from applying certain procedures in sales activities²⁰. In order for a ban to be imposed, these procedures must distort competition or be intended to distort the preconditions for effective competition. A municipality or a county council may, in an equivalent manner, be completely forbidden from engaging in certain sales activities. An activity cannot be forbidden if it is deemed justifiable with regard to public interest or is in accordance with the law. These rules make it possible to examine and intervene against distortions of competition that may occur when the state, a municipality or a county council sells goods and services on competitive markets.

Measures to reduce the risks of the co-ownership of nuclear power plants

The Competition Authority has previously in various contexts highlighted the general risks of the co-ownership of electricity generation resources. The risks of negative effects of co-ownership in Swedish nuclear electricity generation are especially great, as it is primarily the three leading companies on the market that co-own these plants, and co-ownership implies above all risks of an illicit exchange of information between the competing companies which diminishes confidence in general in a functioning market.

¹⁷ The Electricity Act (1997:857) and the Act on Certain Pipelines (1978:160).

¹⁸ The Competition Act (2008:579), Chapter 2 Section 1 (anti-competitive co-operation) and Section 7 (abuse of dominant position).

¹⁹ Articles 101 and 102 of the Treaty of Lisbon.

²⁰ The Competition Act (2008:579), Chapter 3 Sections 27-32.

The Government has unsuccessfully tried to negotiate limitations to the co-ownership in the nuclear electricity generation, and therefore considers that the confidence issue in relation to co-ownership remains. However, following a proposal from the EI, the owners of the nuclear power plants have adopted common ethical rules for the industry governing the exchange of information between the companies. The owner companies make an annual report to the EI concerning compliance with these rules. Independent observers also have seats on the nuclear power companies' boards, with a special remit to monitor the sector's ethical rules. It is the EI that has nominated the observers and it will publish annual reports from each company, including any comments by the observers. The Competition Authority considers that the agreement on common ethical rules for the industry on information management and greater transparency in the boards of directors of the nuclear power companies represent measures that can strengthen confidence in the market. However, it considers that the fundamental risks that stem from the existence of structural ties between the major competing producers still remain. The aspiration should therefore continue to be the breaking up of the co-ownership of nuclear generation.

Nord Pool regulations - price-influencing information and market supervision

All actors on the Nord Pool Spot and Nasdaq OMX must comply with the electricity exchange regulations on the handling of information that influences prices. All producers and other actors are obliged to inform Nord Pool of, among other things, the following data immediately or at the latest within sixty minutes:

- All company information that may have a considerable effect on prices, although this does not include corporate plans and trading strategies.
- The following information on generating plants, consumption and transmission within or directly connected to the Nordic electricity spot area:
 - Planned maintenance or generation restrictions that affect more than 100 MW during the following six-week period.
 - Planned maintenance or generation restrictions that affect more than 400 MW with regard to plants for generation, consumption or transmission during the current year or the following three years.
 - Unscheduled generation stoppages and failures that affect a generation capacity in excess of 100 MW.

A market actor with access to some form of information that influences prices which is not known may not trade until it has been made public at Nord Pool Spot via what is termed a UMM (Urgent Market Messages). This applies to trading in electricity on the physical market and in financial contracts on the futures market, as well as the trade in emission rights within the EU emission rights trading system (EU ETS). If a single unit of a trading

company is in possession of information that affects prices, trading may still proceed, if the company can show documents to Nord Pool that prove there are physical or other barriers to information transfer between the various units within that company. The rules also include provisions on employee and board member confidentiality within the companies in respect of information that influences prices which was not communicated to Nord Pool.

Nord Pool Spot publishes aggregated information on supply, demand, and transmission capacities between electricity spot areas as well as prices for different areas and products. With regard to transmission capacities, Nord Pool Spot publishes allocated capacities as well as the transmission limitations that may have led to capacity reductions. It also makes public the bidding curves (the buying and selling bids for different volumes) and the equilibrium price every single hour for the system price. This report is updated daily and publication is undertaken for the coming twenty-four-hour supply period in the afternoon of the previous day.

Nord Pool Spot regulations contain provisions on bidding on the spot market. In accordance with Nord Pool Spot's market place concession, Nord Pool Spot has a special market supervisory function that continuously follows trading, in order to create confidence in price formation. This monitors all transactions with respect to the actors supplying the information that they are obliged to divulge, in order to prevent insider trading, price manipulation and the exercise of market power. The actors are also obliged to provide Nord Pool Spot without delay with all information that it deems relevant to its ability to supervise trading. The market supervision unit publishes reports of completed investigations of suspected infringements of the rules on the Nord Pool Spot website. If and when an infringement of the rules is detected, there is a system of sanctions which include warnings, fines and the withdrawal of trading permits.

Within the Nord Pool group, there was previously joint market supervision of the physical trading (Nord Pool Spot) and the financial trading (Nasdaq OMX). As from autumn 2011, there are separate units for market supervision for both market places. Close cooperation continues between the two market supervision units, however. In order to make the information flow more efficient, Nord Pool Spot is currently investigating the possibility of launching a new and more developed UMM system.

Greater transparency in Nord Pool Spot operations

A fundamental requirement for an effective, competitive market is that all the actors on the market have simultaneous access to all information affecting the market. The actors' trust in the market is affected negatively in the event a number of actors have information advantages. The potential information

symmetry can skew competitive relations to the advantage of actors who are vertically integrated. It is therefore important that the system that supplies market information is developed in such a way that all information affecting the market is received simultaneously by all market actors, and in an efficient way.

Since spring 2011, there is a so-called insight council within Nord Pool Spot. The council includes representatives of the regulatory authorities in Sweden, Finland, Norway, Denmark and Estonia, as well as the management of Nord Pool Spot. Sweden is represented by the Energy Markets Inspectorate. One of the tasks of the council is to provide the Nordic regulatory authorities with better insight into the bidding on Nord Pool Spot.

The retail market

The Swedish retail market for electricity has been open to competition since 1996. There is no price regulation. The total number of household customers on the market amounted to around 4.4 million at the end of 2011.

In the middle of the 1990s, there were around 220 electricity suppliers. Since then, the number of electricity suppliers has fallen, in particular due to acquisitions and mergers, as many municipalities have elected to sell their electricity supply companies. In recent years, the number of electricity suppliers has been more or less unchanged. In December 2011, there were around 120 electricity suppliers. More than half of all electricity suppliers are parts of corporate groups generating electricity.

The work on a Nordic retail market is in the middle of an intensive phase

The Swedish retail market for electricity is currently national. For several years, there has been a political will to create a common Nordic retail market for electricity. A common Nordic retail market would mean that consumers in the Nordic countries could freely choose their electricity supplier across national borders.

During 2011, the Nordic regulatory authorities within the cooperation body NordREG (Nordic Energy Regulators) published recommendations for the future market model on the common Nordic retail market. The recommendations entail that customer should be able, to a greater extent than today, to use electricity suppliers only when acting on the electricity market. Electricity retailers should be responsible for those parts of the customer interface relating to products and services on the open market, that is to say all types of electricity contracts. The electricity supplier should also be the customers' primary contact when changing electricity suppliers or moving house. The market model chosen, which is usually called a so-called "supplier centric model", is expected to come into force in 2015 and will in all probably increase the customers' propensity to choose their electricity contract actively.

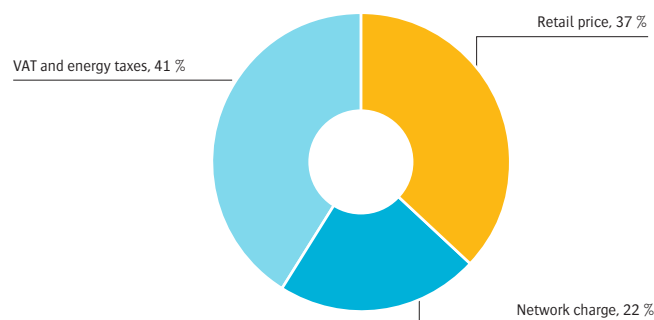
The EI in conjunction with its European counterparts within CEER (Council of European Energy Regulators) have also agreed on 13 recommendations for how actors on the electricity and gas markets shall act. Among other measures, the CEER recommends that electricity and gas retailers shall be the primary contact for customers in relation to switching suppliers, invoicing and moving house. The electricity and gas retailers shall also invoice the cost of both the electricity supply and network fees, which is well in line with the market model selected for the Nordic market. The purpose of the recommendations is that the EU member countries shall achieve the common goal of a harmonised electricity and gas market throughout Europe.

Electricity supply costs is the larger part of total electricity costs for private customers

Total consumer costs for electricity comprise the cost of supplying the electricity itself (supply cost), the cost of transmitting the electricity (network cost) and also energy taxes and VAT.

The proportion of the electricity supply price of the households' total electricity cost has increased over the last decade. The total electricity cost for a household in 2011 amounted to SEK 1.37 per kWh. In January 2012, the electricity supply price for a household customer living in an electrically heated single-family house made up 49 % of the cost, compared to 47 % one year earlier. The network fee made up 15 %, while energy tax and VAT together represented 36 %, as shown in Figure 9.

Figure 9. Total electricity cost for a household customer in an electrically heated single-family house as at 1 January 2012

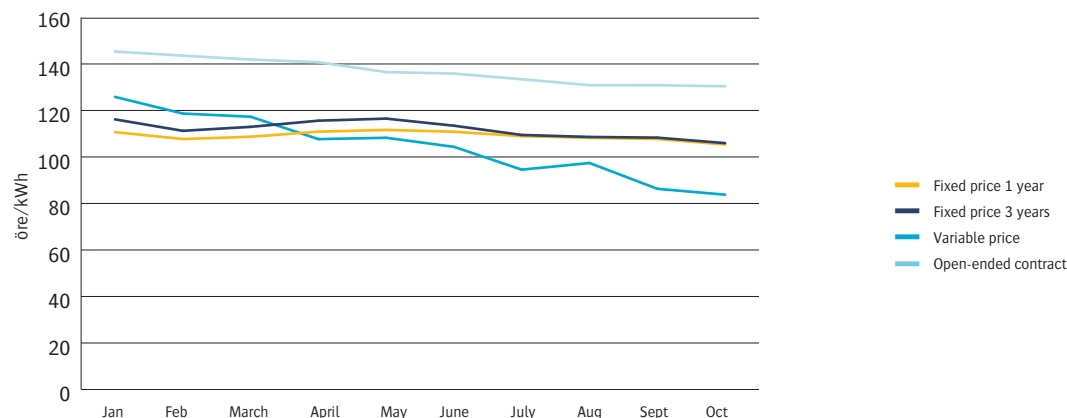


Source: The Swedish Energy Markets Inspectorate and SCB

Falling electricity supply prices

Figure 10 shows the development of the electricity supply price for the most common contract forms for household customers with an annual consumption of 20 000 kWh. Those customers who had fixed price contracts in 2010 in general paid slightly less for their electricity than those who chose a variable price during the year. As from 1 November 2011, Sweden was divided up into four bidding areas, which meant that the price sometimes varies across the country. The figure on the following page shows the price development up until 1 November.

Figure 10. Development of the electricity supply price for the most common contract forms during 2011



Source: The Swedish Energy Markets Inspectorate

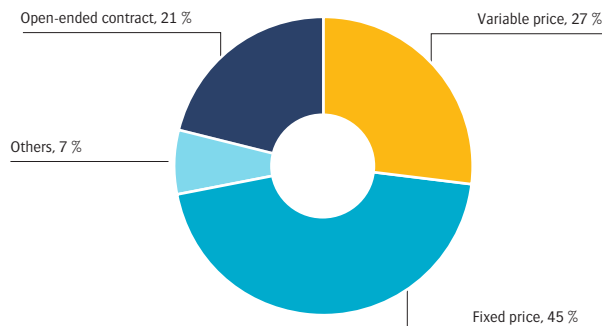
Most customers choose fixed price contracts

Approximately 42 % of customers had fixed price contracts in December 2011. Of these, almost 20 % of customers had fixed their price for three years, which is a marginal increase compared to 2010. Fixed price contracts for one year increased to 18 % during the year. In December 2010, just over 27 % of customers had variable price contracts, compared to almost 29 % at the same time in 2010.

Fewer and fewer electricity customers in Sweden choose open-ended contracts, where customers who have not made an active choice of supply contract have to pay the price stipulated. In December 2011, just under 24 % of all customers were in this category, a drop of two percentage points compared with the same month in 2010. The declining proportion of customers with open-ended contracts is probably a result of customers on the electricity market having become more aware that this price is often set higher than in the case of variable- or fixed-price contracts, which the customer actively concludes with a supplier. In May 2012, the EI presented a proposal for reducing the proportion of customers with open-ended contracts²¹. In order to increase awareness in inactive customers, facilitate rational choices by them and ensuring everybody receives synonymous information about designated agreements, the EI proposes more stringent requirements for the information issued by designated electricity suppliers to designated customers. The EI also proposes that network owners shall appoint designated electricity suppliers in an open, non-discriminatory and market-orientated manner in the future.

²¹ EI R2012:07 Systemet med anvisad elhandlare.

Figure 11. Distribution of household customers per contract type in December 2011



Source: SCB

More than every third household changed or re-negotiated their contract

In total, more than 1.6 million households were active on the electricity market during the year, either by changing electricity suppliers or by entering into a new contract. This corresponds to almost 37 % of the total number of household customers on the Swedish electricity market. Increased activity among customers leads to increased competition among electricity suppliers, which may put downwards pressure on price and favour customers through better offerings.

The number of switches in electricity suppliers rose slightly in 2011 compared to 2010. In total, 11.2 % of all household customers in Sweden changed their electricity supplier during the year. Apart from switching electricity suppliers, customers can be active on the market by renegotiating their agreement with their current supplier. In total, 25.6 % of all household customers in Sweden entered into new electricity contracts during 2011, which was an increase of 1 % compared to 2010.

A customer wishing to change electricity suppliers enters into a new agreement with the new supplier, who then reports the change in suppliers to the customer's network company. According to new regulations in the Electricity Act, the switch may take place on any day of the week, and must take no longer than two weeks. The customer pays no fee for changing electricity suppliers.

The web-based price comparison site Elpriskollen

All Swedish electricity suppliers are obliged by law to supply the Swedish Energy Markets Inspectorate with details of the terms and conditions they offer the consumers. At the end of January 2008, the EI launched its independent, web-based price comparison site Elpriskollen, which brings together prices and terms and conditions for all Swedish suppliers in order to facilitate consumers choosing the supplier and the contract that best suits them. During 2011, Elpriskollen registered just over 150 000 visits. In total, there are around four million household customers in Sweden.

The Swedish Consumer Energy Markets Bureau was appointed a common contact point for consumers

In December 2011, the EI appointed the Swedish Consumer Energy Markets Bureau to be the joint contact point for electricity and gas consumers according to the EU's Electricity and Gas Market Directives. The background to this was EU regulations stating that member countries should have such contact points to which consumers could turn with questions about their rights and opportunities for dispute solution. The Swedish Consumer Energy Markets Bureau is an independent bureau informing and giving advice and guidance on issues relating to the energy market. The advice is free of charge. The task of the Bureau is also to capture consumer problems within the energy market area and pass them on to the authorities and companies affected.

The EI is one of the principals behind the bureau, which informs and gives advice and guidance on issues relating to the energy market. During 2011, the bureau received around 2 800 direct contacts from consumers, which was considerably fewer than in 2010. Just under half of the contacts concerned complaints and questions about the companies' treatment of customers. The bureau contributed to the complaints being quickly referred back to the companies, and then solved in a proper and customer-friendly way. Most complaints concerned electricity price agreements or invoices. These concerned unclear points about pricing or agreement terms and conditions, or problems in conjunction with outreach sales. Customers of some companies suffered from failure to supply invoices over a long time, despite meter readings being available.

Electricity suppliers are obliged to state the origin of the electricity

According to the Electricity Act, electricity suppliers are obliged to provide information about the origin of the electricity in or in conjunction with invoices and advertising to customers. This means information about the proportion of each individual energy source in the generation of the electricity sold by the supplier during the previous calendar year. The customers shall also receive information about the impact on the environment in the form of carbon dioxide emissions and the amount of nuclear waste caused by the generation of the electricity sold.

During 2010, the EI was mandated to try to achieve a voluntary industry solution within the framework for the existing regulations for coordinating the regulatory frameworks for guarantees of origin and origin marking of electricity. The result of the report²² was that the EI drew up regulations²³ entailing that guarantees of origin shall be a prerequisite for being allowed to sell electricity with a specific origin. The purpose of the regulations is to provide clear information to customers about the origin of the electricity and the impact the electricity generation has had on the environment.

²² Ursprungsmärkning av el EIR 2011:10.

²³ EIFS 2011:4

The system of guarantees of origin means that an electricity producer can apply for guarantees of origin for the electricity produced by the company. With the help of these guarantees, electricity traders can then guarantee a customer who chooses to buy wind power electricity, for example, that the same amount of wind power electricity has been fed into the system as the customer has consumed. A large number of electricity suppliers are already offering electricity contracts based on guarantees of origin. To date, it has not been mandatory for electricity suppliers to use guarantees of origin specifically in order to mark the origin of electricity to end users. Nor have there been any requirements for how electricity suppliers shall transmit information about the origin of the electricity to customers.

Implementation of consumer protection measures in the Electricity Market Directive

Sweden has implemented large sections of Annex A on consumer protection measures in the Electricity Market Directive, by means of the Electricity Act and its associated instructions. During 2011, a definition of vulnerable customers was introduced in the Swedish regulatory framework. It follows from the definition that vulnerable customers refers to persons who are permanently lacking ability to pay for the electricity or natural gas transferred and delivered to them for purposes that fall outside business operations. During the year, regulations in the Electricity Act were also introduced concerning the information to be included in the electricity suppliers' and network owners' contracts with individual consumers.

During autumn 2011, the EI carried out an audit of the electricity suppliers' new liability to state the obligations they have towards consumers, the terms and conditions of invoicing, payment, extension and termination, and also the term and conditions for compensation if the electricity supplier does not fulfil its obligations. The EI also audited whether electricity suppliers state or refer to information on their websites and invoices about the consumers' rights, how consumers shall go about making complaints and where consumers can turn for information and dispute solution. After the EI had notified failings, the companies audited carried out measures to rectify the failings.

EI monitors the general price development, but does not supervise the electricity or gas supply prices. The electricity suppliers are, however, obliged to provide information about the price and the terms and conditions of supply used for delivery of electricity to consumers. This information forms the basis for the electricity price comparison aimed at consumers which is available on the EI's website, www.elpriskollen.se. At Elpriskollen, consumers also get information about the most important terms and conditions for electricity supply contracts, such as notice period, any cost of early termination of the contract and whether the contract is extended automatically when the contract period ends. The Swedish Consumer Agency, municipal consumer guides and the Swedish Consumer Energy Markets Bureau also provide information about the general terms and conditions of contract.

The Swedish Energy Markets Inspectorate work in line with national and European legislation

The EI continuously investigates the function of the electricity markets. This task follows from the EI's role as the network authority in accordance with the Electricity Act and the supervision the network authority shall exercise in accordance with Chapter 12 Section 1 second paragraph of the Electricity Act. According to its instruction, the EI also has the task of monitoring and analysing the development of the electricity market and to provide proposals for changes to the regulatory framework or other measures to promote the function of the markets. Section 1 of the instruction further states that the EI shall promote effective competition on the electricity market, among other tasks.

According to Article 37.1 d of the Electricity Market Directive, the national regulatory authorities shall monitor and carry out the legally binding and relevant decisions made by ACER and the European Commission. No special legislation is required for this to apply in Sweden, as the regulation is of information character. In order to make it possible for the EI to follow the Commission's decision, provisions have been introduced in Chapter 12 Section 1 b of the Electricity Act and Chapter 3 Section 4 and Chapter 4 Section 3 of the Act (2011:710) on Certification of Transmission System Operators for Electricity. The provisions entail that EI, in decisions which are affected by such guidelines as referred to in Article 29 of the Electricity Market Directive, shall state that the decision may be changed or reversed at the request of the European Commission. The EI is allocated an appropriation from the state budget each year. According to Section 10 of the Appropriations Ordinance (2011:223), a public authority that has been allocated an appropriation is entitled in accordance with the applicable terms and conditions to use state funds for those purposes to which the appropriation relates.

According to the Electricity Act, it is part of the EI's tasks as network authority to exercise supervision to ensure the companies fulfil their obligations under the electricity legislation. Chapter 12 Section 1 fourth paragraph of the Electricity Act states that the EI is also the regulatory authority in accordance with the Directive (EC) 714/2009. From Section 1 6 e of the Ordinance with Instruction for the Energy Markets Inspectorate, it further follows that the EI shall fulfil tasks within its area that follow from the Electricity Market Directive. According to Chapter 12 Section 2 of the Electricity Act, the EI is entitled to request and receive such information and read such documents as is required for the regulation. From Chapter 12 Section 3, it emerges that the EI may issue such injunctions as are required in order to safeguard compliance with the regulations and terms and conditions are covered by the regulation. According to Chapter 12 Section 3, the EI may issue such injunctions as are required in order to safeguard compliance with the regulations and terms and conditions are covered by the regulation. According to Chapter 12 Section 3 first paragraph second sentence of the Electricity Act, such injunctions may be accompanied by a fine. There is nothing to stop such a fine amounting to up to 10 % of a company's turnover.

Security of supply

Supply security in the Swedish electricity system is generally good. It has never been necessary to resort to manual disconnection of consumption, which is the method Svenska Kraftnät must use in accordance with the Electricity Act when it is impossible to achieve balance between generation and consumption in the electricity system.

The installed electricity generation capacity continued increasing

The installed electricity generation capacity increased during 2010. In Sweden, investments in new electricity generating capacity is made on a market basis. No permit from the EI is required to build new plant for electricity generation in Sweden, however permits are needed according to both the Environmental Code and the Planning and Building Act. During 2011, an additional 948 MW of generating capacity came on line, while 202 MW was decommissioned. The net increase was therefore 746 MW, which brought the total capacity to 36 447 MW.

Table 5. Installed electricity generation capacity, MW

Type of power	Installed electricity generation capacity	Change from 2010
Hydroelectric power	16 197	0 %
Nuclear power	9 363	2.3 %
Other heating power	7 988	- 2.4 %
Wind power	2 899	34 %
Total	36 447	2.1 %

Source: Swede Energy

The table shows the change in production capacity per power type compared to last year. Hydroelectric power had the greatest installed electricity generating capacity, with 16 197 MW, followed by nuclear power with 9 363 MW. Other heating power fell compared to last year. Of the total net increase in electricity generating capacity in 2011, wind power was responsible for the greater proportion, with 736 MW. Wind power capacity thereby increased by 34 % compared to 2010.

The short-term forecast²⁴ of the Swedish Energy Agency was published in March 2011 and covers the Swedish energy system's development during the period 2009-2012. In the forecast, domestic electricity consumption is expected to increase over the period, from a level of 138 TWh in 2009 to 148 TWh in 2012. Electricity generation in the country amounted to 134 TWh for 2009. According to the forecast, generation will increase

²⁴ Swedish Energy Agency, Kortsiktsprognos våren 2011, (ER2011:04).

throughout the period, and by 2012 will be 158 TWh. The long-term forecast²⁵ of the Swedish Energy Agency was published in spring 2011, and addresses the long-term development of the power system up until 2030, by which time Sweden is expected to export 23 TWh of electricity. This is due to increased electricity generation and a moderate increase in electricity use. By 2030, electricity generation is expected to total 175 TWh. Combined heat and power, wind and nuclear power generation is expected to increase. Electricity usage is estimated to be 152 TWh.

Market-based power reserve

The installed power of the Swedish electricity generating system has fallen since the 1990s. The capacity margin between supply (including imports) and demand dropped by almost 20 % between 1996 and 2000. This means a greater risk of disconnection for certain customers if a major power station should break down in severe winter weather, a scenario that prompted the government to pass a power reserve law in 2003²⁶. This reserve will be formed by Svenska Kraftnät concluding agreements with producers and consumers on making available further production capacity or a means of cutting consumption. On 20 April 2010, the Riksdag decided to extend the validity of the Power Reserve Act, and also to amend the same Act as from 16 March 2011. The decision means that the Power Reserve Act with the centrally procured reserve will be extended, in order to be gradually phased out by 15 March 2020.

By means of the legislative amendment, the Government and Riksdag have established that the issue of maintaining the power balance in the long term must be solved by the actors on the market. The fact that the state, via Svenska Kraftnät, procures electricity generation and consumption reductions on a market open to competition is deemed to disrupt the function of the electricity market. However, a transfer to a market-based solution should take place under reasonable conditions, and not jeopardise the security of supply, at the same time as promoting consumption flexibility.

Svenska Kraftnät has carried out a review of the management of the power reserve, partly as a result of the new legislation. The review has resulted in a change in the management of the reduction aspect of the power reserve. Contrary to previous years, the procurement of the consumption reductions will only cover bidding on the balancing market. Again contrary to previous years, the management of the consumption reduction resources shall also permit plant owners to make their own bids for the resource to the Elspot market. If the resource is not activated on the spot market, it will remain at the disposal of the balancing power market. By means of the resources being available as bids on the spot market, they participate in the price formation, which differs from the current management.

²⁵ Swedish Energy Agency, Långsiktsprognos 2010, (ER2011:03).

²⁶ Power Reserve Act (2003:436).

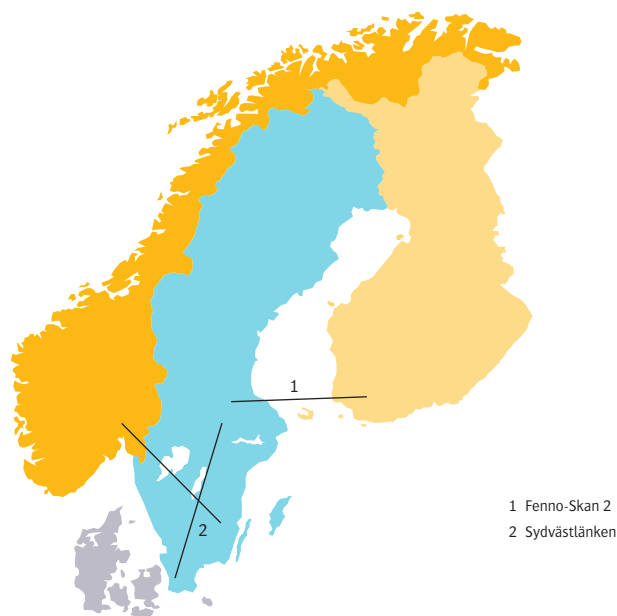
The greatest electricity consumption in 2011 was 25 820 MW, and occurred on 23 February between 8 am and 9 am. Sweden's greatest electricity consumption to date is 27 000 MW, and occurred on 5 February 2001.

New transmission links

The Swedish electricity system has links to Norway, Finland, Denmark, Germany and Poland. Sweden exported 22 TWh electricity and imported 14.8 TWh during 2011, which resulted in Sweden being net exporters of 7.2 TWh on an annual basis. This can be compared with 2010, when Sweden imported 2 TWh net. The primary reason for the increased export is higher filling levels in the Swedish water reservoirs, and greater availability of Swedish nuclear power.

Several projects are in progress to increase the capacity and operational security in the Nordic power system. Figure 12 shows the projects impacting on Swedish land which are under construction.

Figure 12. Current projects to reinforce the Nordic grid



Source: Svenska Kraftnät

As far back as 1989, an 800 MW capacity power link was constructed between Finnböle in Sweden and Rauma in Finland. Due to the greater demands on transmission capacity, this link now needs to be extended. The

new Fenno-Skan 2 cable will follow the same route as the existing one and have a transmission capacity of 500 MW. Cable laying commenced during the spring of 2008, and the cable came into operation on 16 December 2011.

The purpose of the South-West Link is to reduce the existing transmission limitations from the Mälardalen region to Southern Sweden and between southern Norway and Sweden. It will be built in three sections, with a junction point in Jönköping, and will have an estimated capacity of 1 200 MW. From Jönköping, one link will run southwards to the Skåne region and another northwards to Hallsberg, while the third link will run westwards to Norway. Svenska Kraftnät is building the Swedish section of the link, while the section under construction in Norway will be financed by Statnett, the Norwegian TSO. The entire link is expected to be operational by 2015/2016.

Svenska Kraftnät has also applied for permission to build a direct-current link, called NordBalt, between Sweden and Klaipeda in Lithuania, linking the three Baltic states' electricity networks with the Nordic network. During spring 2011, the EI proposed that the Swedish Government approves Svenska Kraftnät's concession application. The link is part of the work of creating an efficient and integrated electricity market in Europe, which is needed in order to achieve the EU's climate policy goals. Currently, a cable between Estonia and Finland is the only link between the Baltic and Nordic countries. The new direct-current link between Sweden and Lithuania is also important in order to reinforce the security of supply in the Baltic countries. The technology used also facilitates future link-up of wind power farms at sea, for example on the Mid-Sea Banks. It is anticipated that a completed link could be ready by 2015/2016.

In addition to the projects mentioned above, there are a number of projects aimed at reinforcing the electricity network in the major city regions in Sweden. Svenska Kraftnät is also designing a grid link between Gotland and the Swedish mainland.

As opposed to natural gas network operations, trading in natural gas is exposed to competition. The trading has gradually been transformed from local monopolies to becoming totally competitive. The final step in opening up the market was taken on 1 July 2007, when the natural gas markets in most EU countries, including Sweden, were entirely opened up to competition. The market reform means that all of Sweden's natural gas customers can choose their natural gas supplier entirely freely. Approximately 3.5 % of Sweden's energy needs are covered by natural gas. However, in the areas where the gas network is installed, natural gas covers more than 20 % of the energy needs, which is in line with the average in the rest of the EU.

The natural gas market

The natural gas network

The Swedish natural gas network stretches from Trelleborg in the south to Stenungsund in the north, with a branch line through Småland. There are plans to expand this branch line, which currently ends in Gnosjö, to Jönköping and thereafter onwards to Oxelösund via Linköping and Norrköping. In March 2011, the Government decided to approve the concession application for the stretch to Jönköping. The transmission network is owned by the company Swedegas.

In Sweden, just over 30 out of the 290 municipalities have access to natural gas. In those municipalities where the natural gas network is installed, natural gas covers just over 20 % of the final energy consumption, which is at the same level as the average for the rest of Europe.

In recent years, the use of natural gas has increased markedly, which is largely due to the Öresundsverket plant in Malmö having become operational.

Figure 13. The Swedish natural gas network



Source: Swedish Gas Association

The natural gas grid can be divided into transmission, distribution and storage operations. Gas is conveyed in pipelines over long distances under high pressure, after which it undergoes pressure reduction at metering and regulating stations before reaching the customers via a local distribution network. The Swedish natural gas grid consists of a ca 620 kilometres long transmission pipeline and around 27 200 kilometres of distribution pipeline. Svenska Kraftnät has overall responsibility for short-term maintenance of the balance between injection and withdrawal of natural gas in the national system. The transmission network is owned by the company Swedegas. The responsibility for operating, maintaining and enlarging the pipeline system rests with the owners of the respective natural gas pipelines. Natural gas can be stored in two ways: by injecting more gas into the transmission pipelines, which thus function as a storage facility, and by using the storage facilities that are part of the system.

No transmission limitations in the natural gas network

The actual available capacity of the Swedish transmission system is around 22 TWh per year. There are currently no transmission limitations in the grid, either nationally or in the import link from Denmark.

Sweden has no secondary market for transmission capacity, where unutilised capacity is made available for trading. This is a consequence of the fact that the gas market model in Sweden diverges from the traditional one used within the EU.

Svenska Kraftnät a balance provider

Svenska Kraftnät is the official system operator on the Swedish natural gas market, which means that it is responsible for maintaining the short-term balance in the Swedish natural gas system. As far as possible, imbalances are managed through market mechanisms, but in those instances where a commercial solution proves ineffective, Svenska Kraftnät orders the pipeline owner to restrict or shut down natural gas supplies to customers.

In order to maintain the short-term balance in the natural gas system, Svenska kraftnät enters into balance responsibility agreements with natural gas companies, according to which the balance provider shall plan to achieve a balance between his supply and withdrawal of natural gas. A balance plan shall be sent to Svenska Kraftnät no later than 2 pm hours on the day before the delivery day. Balance settlement by Svenska Kraftnät is done on a twentyfour hour cycle no later than 12.00 noon on the day after the twenty-four delivery period, and this is based on the reported meter readings from the network owners and reported trading values from the balance providers.

According to the Natural Gas Act, Svenska Kraftnät cannot conclude balance agreements with individual gas suppliers until the methods used for drafting the agreements have been approved by The Swedish Energy Markets Inspectorate.

Svenska Kraftnät has drawn up a standard agreement that shall provide a basis for the way in which the individual balance agreements will be drafted.

Currently there are preparations in progress to transfer the system from Svenska Kraftnät to Swedegas. According to Article 10 of the Gas Market Directive, those responsible for the systems in the transmission systems shall be certified. On 9 June 2011, a Swedish enactment on certification of transmission system operators was issued, and came into force on 1 August 2011.

An application for certification from Swedegas AB was received on 30 August 2011 and supplementary appendices dated 11 November 2011. The EU made its preliminary decision on 1 March 2012. The preliminary decision was reported to the European Commission on 8 March 2012. The Commission issued its statement on the preliminary decision on 30 April 2012, and this was received by the EI on 14 May 2012. From this date, the EI has two months in which to make a final decision.

Audit of gas network costs

The Energy Markets Inspectorate regulates the gas network companies and approves the methods that they use to calculate their network fees. In setting fees for the transport of natural gas, particular attention should be paid to the number of customers supplied, their geographical location, the amount of energy transmitted, subscription costs for above-ground pipelines, security of supply and the pressure in the pipelines.

The Natural Gas Act will be amended²⁷ so that the method approval is expanded to also cover tariffs for access to a gasification plant. Those who own such plants may thus not start to implement their access fee until the EI has approved the methods used for designing the tariff. The amendment will be made against the background of the requirements that follow from Article 41.6 a in the Gas Market Directive, and comes into force on 1 July 2012, but is conditional during a transfer period by transfer regulations.

The EI's monitoring of the methods on which the design of the fees are based is aimed at ensuring that they are objective and non-discriminatory in accordance with the requirements in the Natural Gas Act (2005:403). Auditing the fairness of the network fees is currently carried out in arrears. The EI's regulatory decisions may be appealed within three weeks by the person or company to which the decision relates. The assessment is made by a public administrative court.

In accordance with the Natural Gas Act, the gas network companies are obliged to draw up a separate financial account of their transmission, distribution and storage operations, in the form of an annual report, which should reach the EI no later than seven months after the end of the financial

²⁷ Government Bill 2011/12:77

year and provides the basis for its regulation. The EI has proposed an ex ante regulation of the fairness of gas network costs, and since 2008 it has therefore developed a method for ex ante regulation of natural gas costs together with the industry and its customers.

In its 2010 letter of appropriation, the EI was commissioned to investigate how the Natural Gas Act can be harmonised with the Electricity Act with respect to the introduction of advance review of gas distribution costs. In its report²⁸, the EI proposes that the Natural Gas Act in all its essential aspects should have the same wording as the Electricity Act with regard to advance review.

Separation between transmission of and trading in natural gas

In order to prevent cross-subsidisation, a company that undertakes transmission of natural gas may not trade in natural gas within the same company, which is termed legal separation. It thus follows that these operations should be accounted for separately. In a company that has a permit for a natural gas pipeline, a member of the board of directors, the managing director or an authorised signatory may not at the same time hold these posts in a company that trades in natural gas. However, Swedish law does not stipulate that a gas network company may not be part of a group of companies that produces or trades in natural gas.

In those cases where a natural gas company does not follow the provisions of the Natural Gas Act, the Swedish Energy Markets Inspectorate has the power to enjoin the company to take measures to comply with the rules and this injunction can be enforced by means of a fine.

According to the Natural Gas Act, companies that transmit natural gas shall draw up a supervision plan and also publish an annual report that describes the measures they have adopted according to this plan. The objective of the supervision plan is to ensure that companies will act objectively and will not unduly favour any market actor. The supervision plan shall describe the measures the company will take in order to counteract discriminatory behaviour in relation to other market actors.

Increased international cooperation

EI is involved in cross-border cooperation in several cooperation bodies. Although there is no formalised cooperation with the other Nordic regulatory authorities, there are continuous discussions with the Danish regulatory authority on how the common market can be developed or the way in which security of supply can be improved. The EI also cooperates with European regulatory authorities in Germany, the Netherlands, Belgium, Luxemburg, France, Great Britain and Ireland. The goal of the cooperation is a common European gas market model by 2014. The cooperation is also aimed at

²⁸ EIR 2010:14 Förhandsprövning av gastariffer

facilitating rapid implementation of European legislation. During 2011, the cooperation has focused primarily on a common trading platform for capacity, with implicit auctions for the entire region.

Since ACER became active in March 2011, the EI has worked on the development of Framework Guidelines in accordance with the process established for developing European regulatory frameworks for a common European market for natural gas.

The wholesale power market

Natural gas was introduced in Sweden in 1985 through an expansion of the Danish natural gas system to southern Sweden via a transmission pipe from Dragör on Zealand to Klagshamn outside Malmö. Sweden does not extract any natural gas, instead all supplies of natural gas come via Denmark. However, Sweden is increasing its biogas production. Between one and two per cent of the natural gas distributed in the Swedish natural gas system is domestically produced biogas. Both the total biogas production and the amount of biogas introduced to the natural gas network are continually increasing, and there is a political ambition to replace natural gas by biogas in its entirety in the long term.

During 2011, 30 % of the natural gas was consumed within industry, and 56 % in combined power and heating and district heating plants. Housing represented around 5 % of total consumption. Other businesses were responsible for the remaining consumption.

Two companies, E.ON Sverige and Dong Energy, sell natural gas on the Swedish wholesale market. Dong Energy is 73 % owned by the Danish government, and E.ON Sverige is owned by E.ON AG, which is the world's largest privately owned energy company. There is no information about the companies' market share for 2011, but there is nothing to indicate that any major changes have occurred since 2006. During 2006, E.ON sold around 5.3 TWh on the wholesale market. This gives it a market share of 48 %. However, this figure does not take into consideration that part of this volume is sold to companies within the E.ON group, which in turn have sold the natural gas on to end users. Table 6 shows the development in consumption on the Swedish wholesale market.

Table 6. Development on the wholesale market for natural gas

	Total consumption (TWh)	Production	Total import capacity (TWh)
2006	11.2	0	15
2007	11.7	0	15
2008	10.7	0	15
2009	14.2	0	15
2010	19.0	0	22
2011	15	0	22

Comment: Consumption expressed as upper heating value. Lower heating value is around 10 % lower.

Source: Svenska Kraftnät and Swedegas

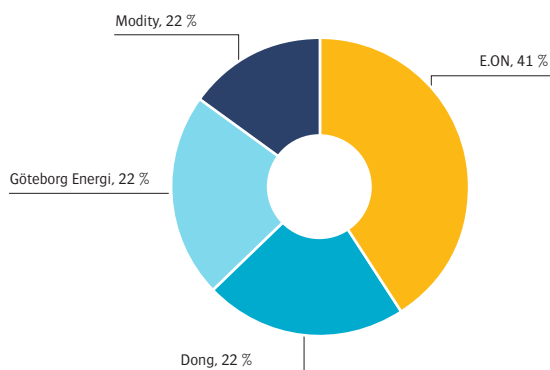
The retail market

There are around 37 000 users of natural gas in Sweden, of which 3 600 are company customers and the rest household customers. The number of end users has fallen in recent years. The reduction is primarily due to the number of household customers having fallen in Göteborg and Malmö.

Few market actors

Since the introduction of natural gas in 1985, the Swedish natural gas market has been characterised by a low number of actors. During 2011, five natural gas suppliers operated on the Swedish natural gas market. The three largest natural gas suppliers, E.ON, Dong Energy and Göteborg Energi, had just under 85 % of the market in 2011.

Figure 14. Market share on the retail market for natural gas in Sweden in 2011



Source: The Swedish Energy Markets Inspectorate

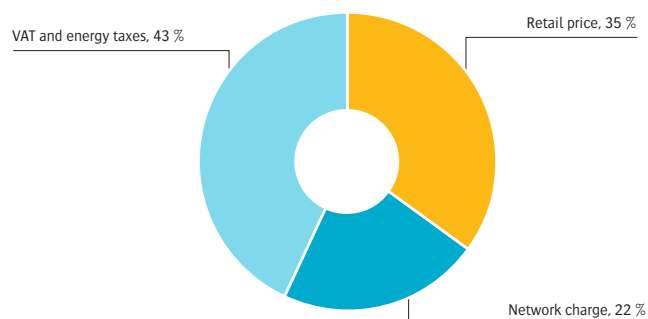
Network fees make up the largest part of natural gas costs for households

The total cost of natural gas for households can be divided up as follows:

- Retail price
- Gas network charge
- Tax and VAT

The proportion of the gas supply cost out of the total cost of gas has increased since last year. For household customers, the supply costs made up 24 % of the total cost of natural gas for 2010, compared to 18 % one year earlier. The network fee made up 42 %, while energy tax and VAT together represented 34 %, as shown in Figure 15. The total cost of natural gas for a household in 2011 amounted to SEK 1.10 per kWh for a household with gas heating, or just over SEK 5 000 for the year.

Figure 15. Total cost of natural gas for a household customer in 2011



Source: SCB

More consumers switched natural gas suppliers during the year

During 2011, 281 households switched natural gas suppliers, which is an increase of 6 % compared to the previous year. The number of switches remains at a low level, and corresponds to almost one per cent of the total number of household customers. The corresponding figure for non-household customers was 177, or just under 5 % of all non-household customers.

The EI produced a study²⁹ in 2008, which showed that only 13 % of household customers and 16 % of business customers on the Swedish natural gas market had actively been searching for a better natural gas contract since the market opened up in July 2007. A third of the customers surveyed were not aware of the possibility of switching suppliers.

In December 2011, the EI appointed the Swedish Consumer Energy Markets Bureau to be the joint contact point for electricity and gas consumers according to the EU's Electricity and Gas Market Directives. The background to this was EU regulations stating that member countries should have such contact points to which consumers could turn with questions about their rights and opportunities for dispute solution. Previously, the advice offered by the Bureau was limited to electricity consumers only.

Implementation of consumer protection measures in the Gas Market Directive

Sweden has implemented large sections of Annex A on consumer protection measures in the Gas Market Directive, by means of the Natural Gas Act and its associated instructions. In 2011, a definition of vulnerable customers was introduced in the Swedish regulatory framework. It follows from the definition that vulnerable customers refers to persons who are permanently lacking ability to pay for the electricity or natural gas transferred and delivered to them for purposes that fall outside business operations. During the year, regulations in the Natural Gas Act were also introduced concerning the information to be included in the natural gas suppliers' and network owners' contracts with individual consumers.

²⁹ Kundaktivitet på naturgasmarknaden
EI R2008:11

The Swedish Energy Markets Inspectorate works in line with national and European legislation

The EI is continuously investigating the functioning of the natural gas market, which follows from the EI's role as regulatory authority in accordance with the Natural Gas Act and the supervision that is to be exercised in accordance with Chapter 10 Section 1 of the Natural Gas Act. According to its instruction, the EI also has the task of monitoring and analysing the development of the natural gas market and to provide proposals for changes to the regulatory framework or other measures to promote the function of the market. Section 1 of the instruction further states that the EI shall promote effective competition on the natural gas market, among other tasks.

According to Article 41.1 d of the Gas Market Directive, the national regulatory authorities shall monitor and carry out the legally binding and relevant decisions made by ACER and the European Commission. No special legislation is required for this to apply in Sweden, as the regulation is of information character. Other regulations, such as an EU Directive, are required to show which decisions are binding and relevant. In order to make it possible for the EI to follow the Commission's decision, provisions have been introduced in Chapter 10 Section 1 a of the Natural Gas Act and Chapter 3 Section 4 and Chapter 4 Section 3 of the Act (2011:711) on Certification of Certain Natural Gas Companies. The provisions entail that EI, in decisions which are affected by such guidelines as referred to in Article 43 shall state that the decision may be changed or reversed at the request of the European Commission.

The EI is the regulatory authority in accordance with Chapter 1 Section 9 of the Natural Gas Act. From Chapter 10 Section 1 first paragraph of the Natural Gas Act, it emerges that the regulatory authority shall exercise supervision of the compliance with the provisions of the Natural Gas Act. From Chapter 10 Section 1 first paragraph 2 of the Natural Gas Act, it further follows that the EI shall exercise supervision that the Directive (EC) 715/2009 is complied with and in Section 1 6 f of the Ordinance with Instruction for the Energy Markets Inspectorate, it also follows that the EI shall fulfil tasks within its area that follow from the Gas Market Directive.

According to Chapter 10 Section 3 of the Natural Gas Act, the EI may issue such injunctions as are required in order to safeguard compliance with the regulations and terms and conditions that are covered by the regulation. Such an injunction may be accompanied by a fine. There is nothing to stop such a fine amounting to up to 10 % of a company's turnover. Chapter 10 Section 2 of the Natural Gas Act shows that the EI is entitled to request and receive such information and read such documents as is required for the regulation. According to Chapter 10 Section 3 of the Natural Gas Act, the EI may issue such injunctions as are required in order to safeguard compliance with the directions covered by the regulation.

Security of supply

Although supply security has been high historically, the Swedish natural gas market can be said to be vulnerable, both in the short and the long term. The situation with a single supply point, together with the fact that Sweden does not extract any natural gas of its own, makes the Swedish natural gas market vulnerable to external disruption in the short term. In a more long-term perspective, gas deliveries from Denmark will reduce. The reason is that the supply of gas from Danish gas fields is falling.

Reduced consumption of natural gas during the year

During 2011, 155.2 TWh of natural gas was consumed in Sweden, a reduction on last year of almost 4 TWh. The reduction was largely due to milder temperatures, which reduced consumption, and the fact that major consumers had had their plants mothballed during part of the year.

A number of projects in conjunction with the Swedish natural gas system for extraction and production are in progress. Natural gas consumption is therefore expected to rise over coming years. Among these the following can be noted:

- A gasification plant for biofuel is planned in Göteborg, which should be able to produce 100 MW of gas of a similar quality to that of natural gas. Production capacity is planned to be 20 MW during the first stage, which is expected to be completed in 2012, followed by the second in 2016.
- Planning is in hand for a second gasification plant for biofuel that is intended to be located in conjunction with the existing natural gas system. The plant may deliver 200 MW of gas starting in 2016. A first preliminary investment decision has been taken in 2011.
- An LNG reception terminal is planned in Göteborg, primarily in order to supply ships with LNG as a fuel. The plan includes a gasification plant that can supply gas to natural gas consumers. The gasification plant may have a capacity of around 200 MW. The plant is planned to be completed by 2012.

A storage facility for natural gas

Sweden has no storage facility for seasonal equalisation of consumption of natural gas. There is a small storage facility which can smooth out consumption peaks. The storage facility is owned by Swedegas and is located in southern Halland.

The daily withdrawal capacity varies from 0.6 to 0.9 million cubic metres per day, which corresponds to 10-20 % of the gas requirement of the Swedish market under winter conditions. The variation is dependent on the pressure prevailing in the storage facility and the grid pipe respectively.

For the foreseeable future, Sweden will have to rely on facilities in other countries or storage in transmission pipelines (linepack), or, alternatively, adapt deliveries to manage market consumption variations, or take measures to address demand.

Plans for new supplies to the natural gas system

The existing pipeline between Malmö and Gothenburg has an annual transport capacity of around 22 TWh, which can be increased to around 30 TWh by means of compressors.

In the autumn of 2009, the Swedish government decided to grant Nord Stream AG a permit to build a natural gas pipeline through the Swedish economic zone in the Baltic Sea. The Nord Stream project comprises a gas pipeline in the Baltic Sea from Russia to the European gas network. It consists of two parallel pipelines that pass through the economic zones of five countries (Russia, Finland, Sweden, Denmark and Germany). Construction of the 1,220 km long gas pipeline commenced in 2010, and the first pipeline came into service in 2011, with both pipelines being expected to be in service during 2012. The objective of the project is to provide an alternative delivery route for the Russian gas reserves. Russia is now the single largest supplier of gas to Europe, and the bulk of this supply is currently transported by pipelines through the Ukraine. No plans have been presented with respect to a connection to Sweden.

Quality control of the natural gas network

The Swedish transmission system consists primarily of steel pipelines. The system status is inspected at regular intervals, and defective or worn equipment is replaced. In the actors' assessment, the pipelines have an expected useful life of at least 40 years, while certain items of monitoring, control and regulation equipment are expected to have a useful life of between 15 and 20 years. Table 7 gives a summary of the inspections carried out, inspection frequency and procedure.

Table 7. Company inspection of the transmission system

Inspection of the transmission system	Time interval	Method
Supervision of works close to the pipeline	6 times/year	Aerial inspection
Inspection of the safety zone close to private dwellings	Once/year	Inspection on the ground
Inspection of the Öresund pipeline	Every third year	Echo sounding
Inspection of the protective pipeline coating	Every eight year	Inspection by "intelligent pig"
Pipeline thickness checks	Every eight year	Inspection by "intelligent pig"

Source: The Swedish Energy Markets Inspectorate

The distribution pipelines are mainly made of polyethylene (PE) material. Steel pipelines are in some instances used to supply gas to customers who need pressures in excess of four bar. Guidelines for the design, operation, care, maintenance and other aspects of distribution networks for a maximum operating pressure of four bar are co-ordinated in the Energy Gas Standards drawn up by the Swedish Gas Trade Association.

Measures to address consumption peaks and delivery shortfalls

Consumption peaks and delivery shortfalls are managed in the first instance by the balance providers by means of the balancing window provided by pressure variations in the transmission network (linepack). If additional measures are required, Svenska Kraftnät will use market mechanisms as far as possible to manage imbalances. In those situations where commercial agreements are not considered adequate for managing imbalances in the natural gas system, the Natural Gas Act allows Svenska Kraftnät to order the owners of natural gas storage facilities and gasification plants to increase or reduce injection or withdrawal on commercial terms. Svenska Kraftnät can also order network owners to limit or interrupt the transmission of natural gas to customers. If this is done, the supply to consumers must be safeguarded.

The actors on the natural gas market shall plan for and take necessary measures to secure the natural gas supply, shall introduce special minimum requirements for a secure natural gas supply for consumers and shall draw up a national plan for crisis situations in the area of natural gas.

When planning and implementing necessary measures in accordance with the Natural Gas Act, natural gas companies shall secure the consumers' supply of natural gas in at least the following instances:

- In the event of a partial disruption of the national natural gas supply not exceeding 24 hours.
- Annually during the winter period from and including December, up to and including February.
- During periods where the temperature is four to five degrees below the normal winter temperature.

Owners of a natural gas pipeline, storage facility or gasification plant shall implement planning and other measures for emergency situations relating to the operation and security of their own installations. These measures shall comprise both crisis and information management in the event of an emergency situation as well as regular assessment of vulnerability and threat patterns. Owners shall draw up a plan for emergencies and information management in the event of an emergency situation and ensure that this plan is disseminated within their own organisation and that it is followed. The owners shall also notify the authority with responsibility for system

operation and other relevant actors of their plan. The natural gas companies submitted their plans to the Swedish Energy Agency for approval for the first time in 2009, while the Agency drew up a national plan for emergency situations in the area of natural gas in 2007.

The measures described in the previous section are aimed at network owners and are not considered to affect the competitive situation of the gas market actors.

In accordance with the requirements of the new Ordinance on Natural Gas Supply³⁰, the assessment of the risks that exist to the secure supply of natural gas in Sweden was made available to the Commission at the end of 2011. Also in compliance with the requirements of the Ordinance, at the beginning of June 2012, a preliminary version of the national preventative measures plan and the national emergency plan was made available to the Commission and the Danish regulatory authority for consultation. The plans are expected to be adopted in September 2012, and become applicable as from 1 October 2012.

³⁰ (EU) 994/2010

Kungsgatan 43
P.O. Box 155
SE-631 03 Eskilstuna
Sweden
Tel +46 16-16 27 00
www.ei.se

Energy Markets
Inspectorate

