

EI R2011:09

The Swedish electricity and natural gas markets 2010

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The Swedish Energy Markets Inspectorate
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Energy Markets Inspectorate R2011:09

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Foreword

The Swedish Energy Markets Inspectorate (EI) is the regulatory authority for the electricity, natural gas and district-heating markets. The report aims to describe trends on the electricity and natural gas markets in 2010.

In accordance with its instructions, the Inspectorate shall undertake tasks that stem from the EU Electricity and Natural Gas Market Directive, including the preparation of an annual report in compliance with the reporting requirements contained therein. The report addresses issues relating to regulation, competition and security of supply and it is produced in accordance with the reporting requirements in the aforementioned Directive.

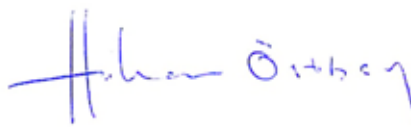
The report describes the remit on the part of the Swedish Competition Authority to report on certain issues of competition on the electricity market, and this account comprises the chapter entitled Measures to prevent market power. The report also describes the duty of the Swedish Energy Agency to report, in consultation with the Swedish state grid utility Svenska kraftnät, on measures to ensure a secure natural gas supply. This account appears in the chapter entitled Security of supply - natural gas.

This report follows the national report structure that was devised in collaboration with other European regulatory authorities and the EU Commission. As part of this common European initiative, a report summarizing all the national reports will be published during the autumn of 2011 and will be available, together with all the national reports of the member states, at www.energy-regulators.eu, the website of the Council of European Energy Regulators (CEER).

Eskilstuna June 9, 2011



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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.

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 national grid 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. Generation in Sweden is based on nuclear and hydropower plants, and in a normal year these two power sources account for around 90% of the total national electricity generation.

On the Nord Pool electricity exchange, electricity is bought and sold among actors in the Nordic countries and high turnover by Nord Pool boosts confidence in price formation.

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.

High demand, increased Swedish generation and volatile prices during the year

The global economic recovery contributed towards a 6% increase in total Swedish electricity consumption during the year. At the same time, nuclear power experienced another year of low generation, partly as a result of extensive refurbishment in 2009. Despite this, Swedish nuclear power generation rose by over 11% compared with the previous year. Hydropower generation increased, despite major shortages in the reservoirs, by almost 1.4% with respect to 2009, which also saw wind generation increase by nearly 40%. The gas-fired Öresund plant and other co-generation plants worked harder than usual in the cold weather, which contributed

to co-generation, which generates electricity and also produces heat at the same time, rising by almost 24%.

The mean spot price in Sweden in 2010 was SEK 0.5448 per kWh, the highest Swedish annual mean price ever recorded. The Nord Pool price trend was marked by price fluctuations, due to such factors as lower nuclear generation and the weaker hydrological balance, as well as higher demand for electricity. Prices peaked in February, when the spot price per MWh stood at SEK 14,000 for one hour. This grave situation continued to be felt during the rest of the year and, in general, the spot price was higher than in the preceding year.

As a result of the transmission limitations in the Nordic area, Nord Pool has divided the Nordic electricity market into several bidding areas, where prices in each one are determined by local generation and consumption as well as by power transmission to and from it. So far, Sweden has constituted a single area, but with effect from 1 November 2011, Sweden too will manage transmission limitations by creating such areas.

The disturbing power situation in Norway and Sweden contributed to the Nordic area having a common electricity price for only 18% percent of the time, a drop of just over eight percentage points in relation to 2009, when it was 26%. At the same time, Sweden was isolated from all other bidding areas for one hour during 2010.

Variable-price contracts still the most common type

A total of almost 1.5 million domestic customers were active on the power market during the year, as they either switched supplier or re-negotiated their contract with their existing one. This represents almost 34% of the total number of such customers on the Swedish electricity market.

For a domestic customer living in an electrically heated one-family house, the supply price represented 47% of the total cost, which can be compared with 41% the previous year. Network costs accounted for 16%, while energy taxes and VAT together comprised 37%.

To assist the consumers in choosing the contract and the supplier that suits them best, the Swedish Energy Markets Inspectorate provides the web-based price comparison site Elpriskollen, which features prices and also terms and conditions for all Swedish electricity supply companies.

Higher Swedish network costs

Network costs often have both a fixed and a variable element. In the case of an electrically heated detached house, the fixed component comprises on average slightly less than 50% of the network cost. The variable element can be modified by customer consumption patterns. During the year, the network companies raised their costs by 4.7% for flat-dwellers, 7.7% for detached-house owners without electric heating and 5.2% for those whose detached houses have electric heating.

The Swedish Energy Markets Inspectorate carries out annual checks to ensure that the network companies have reasonable costs, and the fairness of these costs is retrospectively assessed up to and including the year 2011. With effect from 2012, the Inspectorate will do this in advance. This new model means that the Inspectorate will decide in advance on the revenue volume that the companies may be permitted to amass during a four-year period. This new regulatory method is designed to prevent unreasonable network costs and ensure that grid operations are run efficiently. These revenues shall cover acceptable costs for these operations and also provide a reasonable return on the capital invested during the period, while account will also be taken of the transmission quality of the companies.

Swedish generating capacity rose during the year

The security of supply in the Swedish power system is generally good, and it has never been necessary to resort to manual disconnection of consumption, which is the method that Svenska kraftnät must use in accordance with the Electricity Act, should it not be possible by any other means to achieve balance between generation and consumption in the power system.

During 2010, an additional 869 MW of generating capacity at Swedish power stations came on line while 470 MW was decommissioned. The net increased was thus 396 MW, which brought the total capacity to 35,701 MW.

The long-term forecast¹ of the Swedish Energy Agency was published in the spring of 2011 and it addresses the long-term development of the power system up to 2030, by which time Sweden is expected to export 23 TWh of electricity, thanks to increased generation and a modest rise in consumption. In 2030, generation is estimated to total 175 TWh, and nuclear, wind and combined heat and power generation are all expected to increase, while consumption is estimated at 152 TWh.

Several authorities monitor the electricity market

Several authorities and bodies collaborate in monitoring the Swedish and Nordic electricity markets in order to use a variety of measures to ensure that they operate smoothly and to prevent market power.

¹The Swedish Energy Agency, Långsiktsprognos 2010, (ER2011:03).

The Energy Markets Inspectorate has the overall responsibility for the Swedish electricity market and the application of legislation relating to electricity and the law pertaining to certain pipelines. The Competition Authority is responsible for applying the rules relating to competition, while the Swedish Financial Supervisory Authority regulates those Swedish actors who, with the permission of the authorities, operate on the financial market. The Swedish Consumer Agency also plays a part in monitoring the electricity market, through such actions as drawing up standard general contractual terms and conditions for the entire industry in order to ensure fair contracts for the consumers on the electricity market. In addition, Nord Pool and Nasdaq OMX undertake internal supervision of trading and corporate behaviour, while Nord Pool Spot, located in Norway, is itself supervised by the Norwegian regulatory authorities NVE (The Norwegian Water Resources and Energy Directorate) and the Financial Supervisory Authority of Norway.

The natural gas market

Trading in natural gas, as distinct from natural gas operations, is open to competition and it has gradually switched from local monopolies to full competition. The last stage in opening up the market was implemented on July 1, 2007, when the natural gas markets in the majority of EU Member States, including Sweden, became completely open to competition. This market reform meant that all Swedish natural gas customers may freely choose their supplier. Around 3.5% of Swedish energy needs are met by natural gas.

No extraction of natural gas in Sweden

There is no natural gas extraction in Sweden, which imports all the natural gas consumed there from Denmark via a pipeline that links these two countries. There are also pipelines from Denmark to continental Europe, which means that Sweden is linked to the continental system.

E.ON Sverige and Dong Energy are the two companies that sell natural gas on the Swedish wholesale market. Dong Energy is 73% owned by the Danish state, while E.ON Sverige is owned by E.ON AG, which is the world's largest privately owned energy company. There are no figures available on their respective market shares in 2010, but there is no indication that there have been any major changes since 2006. In 2006, E.ON sold around 5.3 TWh on the wholesale market and thus had a 48% market share. However, this figure does not take into account that a part of this volume is sold to other companies in the E.ON Group, who in turn resell the natural gas to end-users.

Few actors and limited consumer activity

Sweden has around 37,000 natural gas consumers, of whom approximately 3,600 are business customers and the remainder are domestic ones. In recent

years, the number of end-users has declined due primarily to a drop in the number of households in Gothenburg and Malmö that use gas solely for cooking. E.ON, Dong Energy and Göteborg Energi had around 90% of the market in 2010.

The total natural gas costs for households can be broken down in supply costs and network costs as well as energy taxes and VAT. The proportion of the total natural gas cost attributable to supply costs has risen since the previous year. For a domestic customer, it accounted for 24% of the total natural gas cost in 2010, which can be compared with 18% one year earlier. Network costs accounted for 42% while energy taxes and VAT made up 34%.

During the year, 266 households switched natural gas supplier, a decrease over the previous year. The total number of switches continues to remain at a low level and is equivalent to around 1% of the total number of domestic customers.

New method for auditing gas network costs

The Swedish Energy Markets Inspectorate inspects the gas network companies and approves the methods that they use to calculate their network costs. Its preliminary audit of these methods provides a basis for establishing costs that aim to ensure that they are objective and non-discriminatory in accordance with the Natural Gas Act. This audit of the fairness of these network costs is currently performed retrospectively, but the Inspectorate has proposed changes to the Natural Gas Act and methods for advance regulation of gas network costs. This legislation is expected to come into effect 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 aim of deregulation was to increase consumer choice and provide conditions for an efficient utilisation of the generation resources. The electricity networks are run as monopolies as it would not be suitable for environmental and macro-economic reasons to construct parallel networks throughout the 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. It can be divided into three levels, i.e., the national grid, regional networks and local networks. The national grid transmits power over long distances at high voltage levels, while the regional networks take power from the grid to local networks and, in some cases, directly to major users. The local networks connect to the regional networks and carry power to households and other end-users. Svenska kraftnät is responsible for maintaining the power balance and the operational reliability of the Swedish power network 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. In 2010, five companies undertook regional network operations and 173 companies, local network operations in Sweden.

Transmission limitations result in Nordic sub-markets

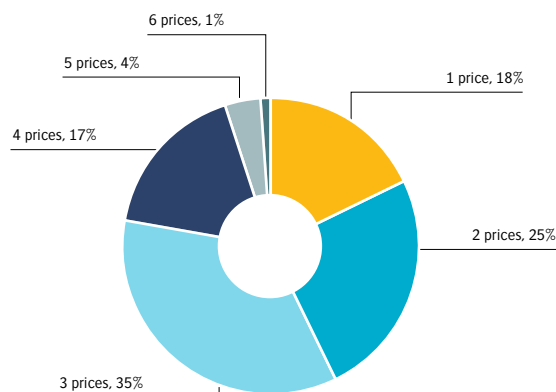
The need to transmit electric power within Sweden and the Nordic area is affected primarily by the availability of hydropower as well as seasonal variations in consumption. However, the power network in the Nordic area has certain limitations in its transmission capacity. Transmission limitations within the Swedish national grid are usually associated with a high level of hydropower 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. During periods of insufficient transmission capacity to meet needs, small sub-markets arise on the Nordic power market, which, as a result of these transmission limitations, Nord Pool has divided into different bidding areas, which are termed spot price or bidding areas. The prices in these individual bidding areas are determined by generation and consumption within the area and the transmission of power to and from it.

The most common bidding areas in Nord Pool are Sweden, Finland, eastern Denmark, western Denmark, northern Norway, central Norway and southern Norway. The latter can during periods of extensive transmission limitations be split into further bidding areas. As a result of Sweden's central geographical location within the Nordic area, it forms a common bidding area with at least one other power spot area virtually all the time. Sweden was isolated from all other bidding areas for one hour during 2010.

In 2010, the Nordic area had a common power price for 18% of the time, as shown in Figure 1. This is a reduction of eight percentage points in relation to 2009, when there was a common price for 26% of the time. One cause of this drop is the worrying hydrological situation in Sweden and Norway.

Figure 1: Proportion of the time during which there were one or more area prices in the Nordic area in 2010



Source: The Swedish Energy Markets Inspectorate

Transmission limitations within Sweden are managed using two methods, reduction of trading capacity and counter trading. By reducing the trading capacity, usually the export capacity to Denmark, market demand for electricity transmission is reduced, and thus the load on the grid. Decisions on reducing trading capacity are taken in the twenty-four hours prior to operation and made public to the market actors before the spot market closes. If a reduction in trading capacity is insufficient to avoid transmission limitations, or, alternatively, the conditions have changed between trading on the spot market and operating hours, Svenska kraftnät will use counter trading to manage the transmission limitation. Counter trading means that Svenska kraftnät orders increased generation in the area where there is a shortage and/or decreased generation in the area where there is a surplus.

These costs, which are termed counter trading costs, are born by Svenska kraftnät and thus provide an indication that the grid needs to be strengthened. In 2010, these costs totalled MSEK 132, an increase of MSEK 88 over the previous year.

Sweden to be divided into bidding areas on November 1, 2011

With effect from November 1, 2011, Sweden will manage transmission limitations through market division, which means that it will be divided into several bidding areas.

On April 14, 2010, the EU Commission took a decision to the effect that Sweden is obliged to alter the way in which it manages transmission limitations in the Swedish electricity network. This decision is a consequence of the fact that the model in use until then was considered to discriminate against foreign customers, and it forms a part of efforts by the EU to establish a common European electricity market. Svenska kraftnät will, as a result of this, divide Sweden into four bidding areas with effect from November 1, 2011. The areas have the following designations:

- The Luleå bidding area (SE1)
- The Sundsvall bidding area (SE2)
- The Stockholm bidding area (SE3)
- The Malmö bidding area (SE4)

This division clearly shows those locations in Sweden where it is necessary to extend the electricity grid. It also provides an indication of where in the country it is necessary to increase generation, in order to achieve a better match with consumption in that specific area, and thus decrease the need for long-distance electricity transmission.

Figure 2 illustrates the geographical boundaries of the bidding areas, which are located where there are limitations on electricity transmission within the Swedish grid, i.e., what are termed bottlenecks. Northern Sweden has a generating surplus compared with demand, while in southern Sweden, the opposite situation applies.

Figure 2: Map of the Swedish bidding areas with effect from November 1, 2011



Source: The Swedish Energy Markets Inspectorate

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. 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 electricity², Svenska kraftnät, together with other Nordic national grid operators, has decided to use the revenues from handling bottlenecks for investments designed to strengthen grids and connections between the countries.³ For 2010, Svenska kraftnät recorded MSEK 560 in bottleneck revenues.⁴ The Swedish

²The proposal of the European Parliament and Council regulation (EC/1228/2003) on conditions for access to networks for cross-border exchanges in electricity.

³Regulation (EC) No 1228/2003 of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity.

⁴According to the Congestion Management Guidelines relating to EC Regulation 1228/2003 conditions for access to networks for cross-border exchanges in electricity, the Swedish Energy Markets Inspectorate no later than 31 July every year shall account for the bottleneck revenues received by Svenska kraftnät and provide a specification of how they have been spent.

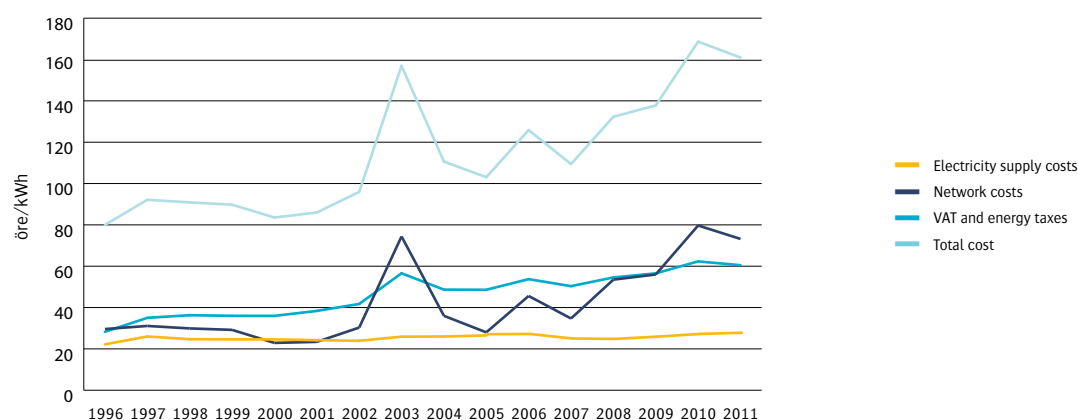
Energy Markets Inspectorate considers that these revenues were used for objectives permitted by the regulation.

Higher network costs for 2011

Network costs comprise around 16% of the total cost of electricity for a normal domestic consumer. As the Swedish electricity network is operated as a regulated monopoly, the Swedish Energy Markets Inspectorate annually monitors that the network costs for the electricity networks are fair. The network costs for some twenty typical customer groups are collected in order to allow easy comparisons of these costs between the network companies. In accordance with the Electricity Act, the companies are entitled to impose costs for operation and maintenance as well as a reasonable return on the capital that their operations represent. The companies are to ensure operational efficiency and provide a good-quality supply. The network costs paid by the customers to their local network companies also include official fees and transmission costs in higher-level networks such as regional ones and the national grid.

Network costs often have both a fixed and a variable element. In the case of an electrically heated detached house, the fixed component comprises on average almost 50% of the network cost. The variable element can be modified by customer consumption patterns. In 2011, the network cost comprises around 17% of the total electricity costs for a detached-house owner. VAT and energy taxes amount to circa 38% of the total electricity costs, while the remaining 45% relates to the electricity cost. Figure 3 shows that the network costs for a typical detached-house owner in Sweden were virtually unchanged between 1996 and 2008, after which they rose somewhat up to 2011.

Figure 3: Change in the total electricity costs for a detached-house owner (20A) with an annual consumption of 20,000 kWh at 2010 prices



During 2010, the network companies raised their costs by 4.7% for flat-dwellers, 7.7% for detached-house owners without electric heating and 5.2% for those whose houses have electric heating.⁵ There are major variations as to the effect on individual customers, ranging from cuts in costs of just over 2% to increases of almost 55%. The clearest trend was that flat-dwellers suffered lower increases than the majority of detached-house owners, while in 2009 the converse applied.

The network costs vary widely among network companies and for flat dwellers, the lowest charge is SEK 720 per annum excluding VAT and the highest, SEK 2,509. The corresponding per annum figures for an electrically heated detached house were a minimum of SEK 3,328 and a maximum of SEK 8,616. The costs for 2011 have not yet been audited, but previous audits have shown that these differences are due to many different factors. Among other factors, cable length, geography and ground conditions have a major impact on network operation costs. Other factors are efficiency and corporate rate of return requirements. Table 1 shows network costs for typical consumer groups in Sweden.

Table 1: Network costs as of 1 January 2011 for typical consumer groups in Sweden

	Median 2011, SEK	Change since 2010
Flat-dwellers, 16A, 2,000 kWh/year	1146,5	5%
Detached-house owners, 16A, 5,000 kWh/year	2538	8%
Detached-house owners, 10A, 10,000 kWh/year	4100	5%
Detached-house owners, 25A, 20,000 kWh/year	6196	5%
Detached-house owners, 25A, 30,000 kWh/year	7600	5%

Source: The Swedish Energy Markets Inspectorate

Low-consumption customers have fewer alternatives than high-consumption customers and the majority of network companies offer small customers only a single type of charge, a single tariff where the same charge is paid irrespective of the time of day at which power is consumed. A time-based tariff is available as an alternative and in this instance the customer pays an amount that depends on when power is consumed. In general, the price is lower at night and higher during the day.

Some network companies have introduced capacity-rated tariffs for domestic customers where a small part of the network costs comprises a fixed price that is linked to the fuse rating, which decides the maximum possible power consumed. In addition, a power charge is levied according to how the household makes use of the power network. The network charge is differentiated within a given fuse rating and different prices may be applied, both at different times of day and year.

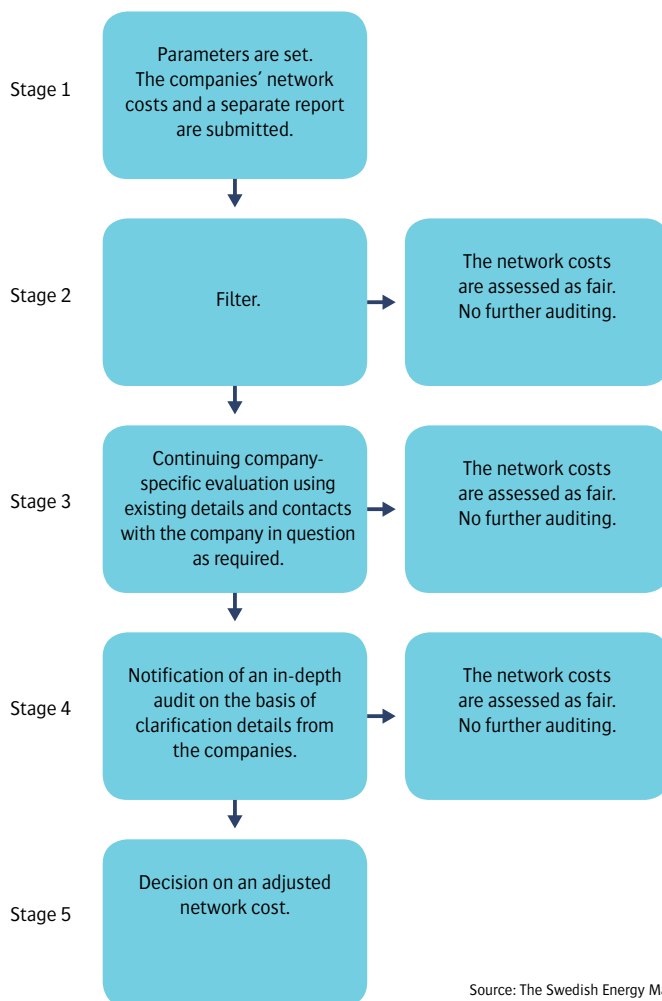
⁵The comparison refers to the difference between January 1, 2010 and January 1, 2011.

Audit of network costs for 2009

The 173 companies that own the Swedish local networks have an exclusive right to operate within their respective geographical areas. Since competition is absent, the Inspectorate exercises regulation by auditing the fairness of the costs that the network companies levy on their customers. Its assessment as to whether costs are fair is based on their reporting both their set costs no later than 15 January every year as well as annual data on financial and other matters no later than 31 July every year.

The data submitted by the network companies is then processed by the EI, verified and compiled for analysis. If any company is found to have costs that are higher than what is deemed fair, an in-depth audit is undertaken, which means that the company is contacted with regard to the underlying factors behind its costs.

Figure 4: Overview of the annual audit of network costs



Source: The Swedish Energy Markets Inspectorate

The 2010 audit included all 173 network companies⁶. The EI's assessment is that the majority of the country's network companies applied a reasonable rate of return in relation to the limits set by the EI. Thirty companies underwent a continuing company-specific evaluation that showed that they in 2009 raised their costs considerably more than the underlying costs increases, due primarily to the fact that many of them now chose to apply a higher rate of return.

The EI will undertake an in-depth audit of fourteen electricity network companies in order to more closely examine the data that they have provided, and they will therefore be finally evaluated in conjunction with next year's audit. At that time, the companies will submit proposed revenue frameworks for the period from 2012 to 2015, on which the EI will then decide. Two companies could not be audited on account of insufficient or missing data and their audits will therefore also continue.

The EI also audited the costs for 2009 levied by the regional network companies. The audit was based on the revenue and cost trend of recent years, and it was found that the trend in their costs was on a par with the underlying cost trend, for which reason no company was selected for a more detailed audit in respect of its costs in 2009.

In its role of system operator, Svenska kraftnät is responsible for designing the national grid tariff, and its total revenues from its network operations should be fair in relation to its objective and subjective pre-conditions for undertaking grid operations. The EI examines the fairness of the grid tariff and obtains annual economic and technical data from Svenska kraftnät in the form of an annual report.⁷ The annual report shall contain a comprehensive account of the network operations, with a profit and loss account and balance sheet. After completing its examination of Svenska kraftnät's compliance with the rules, the EI did not find anything that required any further comment.

New method for auditing network costs

During the year, the EI continued its work on the development of a new regulatory method, which commenced in 2009 in accordance with new rules in the Electricity Act (1997:857), which mean that with effect from 1 January, 2012, it will review the network costs of the network companies in advance. This new model implies that the EI will decide in advance on the volume of revenues that the companies may be permitted to amass during a four-year period.

⁶EIR 2010:25 - Assessment of the electricity network companies' network tariffs in 2009.

⁷This is done on the basis of the "National Swedish Board for Industrial and Technical Development regulations and general advice (1995:1) on reporting of network operations" revised by NUFTS 1998:1.

These revenues shall cover acceptable costs for these operations and also provide a reasonable return on the capital invested during the period, while account will also be taken of the quality of the manner in which the companies undertake their operations.

This regulatory method has been devised to allow predictability in regulatory efforts and it is used to calculate capital costs, current costs and the quality of network operations for a regulatory period.

At the end of March 2011, the network companies applied for revenue frameworks for the first period, which runs from 2012 to 2015. The EI will set these no later than October 2011, when an entirely new model for auditing company costs will be in place.

Harmonisation efforts for balance regulation in The Nordic area

There is limited scope for storing electricity and thus it must be generated and consumed instantaneously. In order to maintain the balance in the system, the market actors submit consumption and generation forecasts to the authority responsible for system operation, which, in the case of Sweden, is Svenska kraftnät. In those cases when the system becomes unbalanced, due, for example, to generation shortfalls or lower imports than estimated, it is the duty of the system operator to balance the system in real time. The Swedish, Norwegian, Finnish and East Danish power systems comprise a common synchronisation area, which means, among other things, that they all operate on a frequency of 50 Hz.

A number of power stations are so equipped that they detect frequency deviations and automatically increase or decrease generation should the system receive too much or too little power. The automatic reserves should be replaced as soon as possible by manual ones so that the former are available in order to manage the next imbalance in the system. Those bids for upward or downward regulation of generation or consumption submitted by the actors in the Nordic countries are compiled in a list and are normally⁸ activated in price order, with the lowest bid first (in the case of upward regulation and vice versa in the case of downward regulation). In this way, the Nordic system operators can minimise their costs. Collaboration on the Nordic regulating power market has existed since 2002 and the Nordic system operators have gradually adapted the requirements and conditions that apply to balance regulation, so that this collaboration works efficiently. There are still differences between the countries, but considerable progress has been made in harmonising the most important conditions, for example, those pertaining to the activation time for a bid on the list as well as the deadline for submitting final plans before the operating hour.

⁸If there is available transmission capacity all bids can be used. However, transmission limitations may cause the non-use of certain bids.

The links to Poland and Germany on their way towards completely open markets

During 2009, the EU Commission commented on the fact that principles for capacity allocation on the two DC links Baltic Cable and SwePol Link are not considered market based. These two cables are interconnections between the Swedish and the German and Polish systems, respectively, which means that the manner in which they are used also affects these countries. The Commission noted that solutions were absent where regionally co-ordinated methods are required such as intra-day handling and allocation of transmission capacity for years and months.

This prompted the EI to analyse the conditions that are attached to the use of Baltic Cable and SwePol Link.⁹ The report showed that there are concrete plans for action and measure relating to connecting Baltic Cable and SwePol Link to the market. The EI's assessment is thus that this market link solution, most of which has been initiated, addresses the concerns raised by the Commission.

New proposal on common Nordic balance settlement

When the system operators choose to activate upward or downward bids, this means that they buy or sell power from those actors who have submitted such bids and thus they incur costs. In the first instance, the variable costs are covered by the balance providers who have caused the imbalance, while the fixed costs are divided up among the entire collective of balance providers.

The balance responsibility for the Swedish actors is regulated in the Electricity Act and in the balance agreement between Svenska kraftnät and the respective balance provider. One actor may conclude a contract with another actor so that he is the one who shall fulfil the balance agreement. The main principle is that there should be a balance provider for every point of consumption.

For a number of years, the Nordic region has striven to establish a common Nordic end-user market, a project that enjoys the firm support of the Nordic energy ministers. This means that efforts focus on facilitating operations by electricity suppliers on all Nordic markets without complicated special rules.

An important step towards a common Nordic end-user market was taken in 2009, when the Nordic system operators introduced common rules as to which costs are to be borne by the balance providers and which are to be added to the network costs, respectively, as well as how the fixed costs of the operation are to be allocated among the balance providers. Furthermore, it was agreed that imbalances would be priced. The result is a system where imbalances on the consumption side are priced according to the cost of the regulating power, while those on the generation side are priced according to the spot price if the generation imbalance "assists" the system, and in other cases, according to the cost of the regulating power.

⁹EIR 2010:10 - Market opening of Baltic Cable and SwePol Link

The objective of a subsequent step is to achieve a common Nordic balance settlement. The idea is that the same balance agreement should apply in all Nordic countries instead of the current situation with one agreement in every country. It is also envisaged that a common Nordic unit will be established for settling the actors' imbalances, with which balance agreements will be signed. This assumes that regulating systems and routines are adapted to a common Nordic model, which will require amendments to existing legislation, but not everything will need to be harmonised for this to work. For example, there are different national rules for measuring and reporting meter readings and for standard estimation of consumption by customers who do not have hourly metering. These differences do not stand in the way of a common balance settlement but may naturally involve variations in costs at a national level.

At the end of January 2011, the Nordic system operators circulated a proposal for a common Nordic balance settlement for comment and consideration. The Nordic regulatory authorities are positive to this initiative and will be following continuing development efforts.

Monthly meter reading and proposals on hourly reporting

With effect from July 1, 2009, the electricity network companies are obliged to read all the electricity meters for domestic customers throughout the country every month, while previously this was to be done annually. One of the objectives of this reform was to allow customers to better monitor their consumption. The reporting of meter readings is the basis for ensuring a businesslike approach to retail electricity supply, planning the national electricity balance and end-user invoicing and it is essential to the proper functioning of the power market that this is done correctly.

During 2010, the Swedish Energy Markets Inspectorate audited meter reading and reporting of meter readings by ten network companies, in order to check whether they had complied with the new requirements. The results reveal shortcomings by eight of the ten companies audited. Therefore, in the spring of 2011, the EI demanded the submission of action plans from the companies involved that would show the measures that would be taken to ensure that the suppliers receive correct meter readings

Consumption flexibility - of major importance to the future electricity market

A higher level of customer activity, especially through greater consumption flexibility, is of major importance to the future development of the electricity market. One possible way to achieve this is to introduce hourly metering of customer consumption.

In 2010, the EI investigated the consequences of introducing hourly metering on the Swedish electricity market.¹⁰ It was concluded that in order for the

¹⁰EIR 2010:22 Increased influence for electricity market customers - Hourly metering for electricity customers with a subscription for a maximum rating of 63 amperes.

implementation of hourly metering and settlement to be positive for the customers and society, this must be done in a manner that minimises the costs while maximising the positive benefits at the same time. The EI thus proposed to the government that all points of consumption with a minimum annual level of 8,000 kWh should have their consumption recorded hourly. This report was submitted to the government in November 2010.

Proposal for an independent council for intelligent networks

The Riksdag has decided that renewable electricity generation in Sweden should increase by 25 TWh by 2020, compared with the level in 2002, which presents a challenge to the adaptation of current electricity networks. Security of supply must remain high despite the fact that this new form of generation affects the networks in a different manner than it does today. Consequently, new technical solutions termed intelligent electricity networks are needed, in order to prevent excessive loads and voltages and also to enhance operational safety.

In 2010, on behalf of the government, the EI investigated obstacles to the use of smart meters and intelligent networks and identified a number of such barriers to the development in Sweden of intelligent electricity networks.¹¹ A low level of knowledge, low priority for research into electricity networks, weak incentives for investments in the new technology, the lack of an action plan for a large-scale expansion of the electricity networks, the design of tariffs and the lack of interesting customer information services are some of the obstacles to such expansion.

In order to improve the conditions for intelligent electricity networks, an independent council ought to be established to increase and disseminate knowledge of such networks. This council shall identify a need for new research, development and demonstration and be able to advise in decisions of government financing of projects, while clear priorities for the field of electricity network technology should also be made within state-funded research. Moreover, the rules for the electricity network monopoly ought to be devised so as to provide incentives for new network services and higher network performance. Svenska kraftnät ought to be given the task of drawing up an action plan for expansion of the networks, while the design of tariffs ought also to be changed, in order to contribute towards preventing power and price peaks. Clear functional requirements must be introduced for information to the customers so that they can respond better to the market price signals. Finally, the present division into a national grid and regional networks ought to be reviewed, as it may constitute an obstacle to efficient use of the networks, pertaining to such matters as planning for the connection of renewable electricity generation.

Exemption from a concession for charging stations

Efforts are currently in progress in Sweden to reduce emissions of greenhouse gases, by, among others, the transport sector, in a cost-effective way. Electri-

¹¹EIR 2010:18 Adaptation of the electricity networks to a sustainable energy system.

cally powered vehicles offer a possibility for enhanced efficiency of energy utilisation and a phasing out of fossil fuels.

In the course of efforts to develop and promote the use of electric vehicles, it was noticed that the location of a charging station is crucial with regard to whether or not the cable that transmits the electricity to the vehicle must have a concession. If it does, the electricity network company must connect every charging post separately to the concessionary network. This carries a risk of both high costs for investment in a connection and for the necessary subscription.

In 2010, on behalf of the government, the EI examined the current concessionary requirement and found that a general exemption ought to be introduced for the construction and use of vehicle charging stations.¹² Exception from a network should in all likelihood favour the expansion of a charging infrastructure for electric vehicles and thus also promote the development of a non-fossil-dependant vehicle fleet.

Legislative changes for a clearer distinction between network operations and trading/generation

According to the Electricity Act, a company involved in network operations may not undertake generation or trading in electricity, but it may form part of a group that does so. Those network companies that are part of such groups generally use the group name with the addition of “network” or a similar term, in order to distinguish network operations from generation and trading. In such cases, the network company usually uses the same logotype and the group website is usually divided into separate areas for network and retail supply.

According to the Electricity Act, all network companies are obliged to produce both a separate financial account and a supervisory plan that will ensure that the network companies act objectively and do not illicitly favour any market actor. The network company shall produce an annual report¹³ on the measures taken in accordance with the supervisory plan to combat discriminatory behaviour towards other actors on the electricity market.

Since January 1, 2010, the following applies to those network companies that are part of a group whose combined network has at least 100,000 electricity consumers¹⁴.

- Company organisation and decision-making shall be separate from companies that undertake generation or trade in electricity.
- A member of the board, the managing director or authorised signatory of a company may not hold such a post in a company that undertakes generation or trades in electricity.

¹²EIR 2010:20 Charging for tomorrow's vehicles - exemption from a concession for charging stations.

¹³The report on the separate financial account and the report on the measures taken in accordance with the supervisory plan are public documents and should be sent to the EI.

¹⁴The six Swedish concerns whose networks have more than 100,000 customers, have just over 60% of the total number of customers in Sweden.

- The company may not grant employees in a leading position salaries or other benefits that are based on the results of those parts of the group that undertake generation or trade in electricity.
- The company shall ensure that it has the right to make independent decisions with respect to assets that it requires to safeguard operations, maintenance and expansion of the network.

Svenska kraftnät, which administers and operates the transmission grid in Sweden, is separated from operations that are open to competition through its ownership structure.

The wholesale power market

The Swedish wholesale power market is part of an integrated Nordic market. The Nordic countries, with the exception of Iceland, are linked together by electricity transmission connections, and the Nordic network is linked in its turn with the European one. Electricity is bought and sold on the Nord Pool Nordic electricity exchange, between actors in the Nordic countries. The operative management of the power grid is undertaken within each country, where the system operator is responsible for the balance in the national system.

Swedish generation is based primarily on nuclear and hydropower, and in a normal year, these two sources account for around 90% of the total national generation.

Increasing turnover at Nord Pool

A high turnover at Nord Pool increases confidence in price formation among the actors. Only a small part of the electricity generated in The Nordic area is sold through what are termed bilateral contracts, i.e., contracts signed directly between two parties. Nord Pool Spot's market share of total consumption in the exchange area rose from 72% to 74% during 2010 - the highest level ever. The total volume traded also increased compared with the previous year, to 307 TWh from 286 TWh in 2009. The number of actors on the Nord Pool Spot markets in January 2011 totalled 325, with 324 actors on Elspot and ninety-five on Elbas. Virtually all the electricity generated in Sweden is sold via Nord Pool Spot.

At Nord Pool Spot, trading is organised in physical power contracts; the physical market includes Elspot and Elbas. Elspot is a twenty-four hour market for short-term trading in physical power contracts. At Elspot, the system (spot) price is set twenty-four hours in advance for every hour of that period.

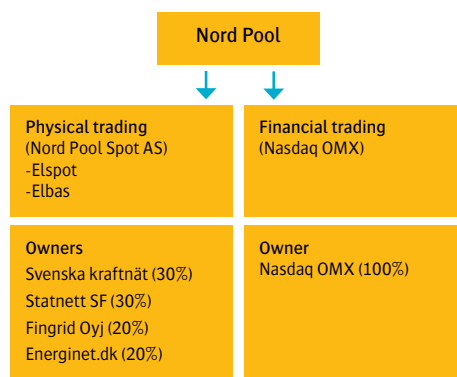
The system price is an equilibrium price, based on the total selling and buying bids in the area. Elbas is a physical adjustment market for continuous trading in hourly contracts in the Nordic countries, Germany and Estonia. Trading may take place up until one hour prior to delivery around the clock.

The financial trading on the Nordic power market takes place on Nasdaq OMX. The financial power market allows risk management for buyers and sellers by offering long-term contracts. These are available for days, weeks, months, quarters and years, with a maximum term of up to six years. The price on the spot market is the reference price for the financial contracts on the market. Emission rights are also traded on Nasdaq OMX.

Total turnover on Nord Pool is dominated by the financial market, and financial trading increased by 73% in comparison with 2009 and totalled 2,108 TWh. In December 2010, the Nasdaq OMX financial market for the Nordic market, the total number of actors amounted to 341.

Nord Pool Spot AS is owned jointly by the Nordic system operators, while in April 2010, financial operations were sold off to Nasdaq OMX by Svenska kraftnät and Statnett SF, and the name Nord Pool ASA was changed to Nasdaq OMX Commodities. The reason for this was that Svenska kraftnät did not consider that running a financial execution venue was part of its core operations. Figure 5 below shows the organisational structure of Nord Pool and its owners.

Figure 5: Execution venues for electricity in the Nordic countries



Source: Nord Pool

Major price fluctuations in 2010

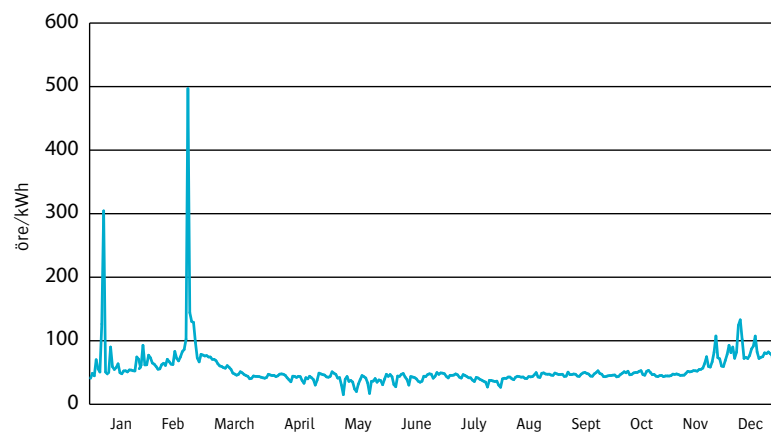
Price formation on the spot market is governed by several factors, certain of which reinforce one another while others operate in the opposite direction. Even if price formation on all markets is affected to a certain extent by

expectations, the price trend on Nord Pool Spot is explained by fundamental factors such as fluctuations in precipitation and wind and temperature shifts.

The price trend in 2010 was characterised by major price fluctuations and the average spot price in Sweden on an annual basis was SEK 0.5448 per kWh, the highest annual mean value so far. At the end of February, the spot price was noted as reaching the highest ever twenty-four hour average, almost SEK 5,000 per MWh, with an hourly price of close to SEK 14,000 per MWh. These price peaks were caused by a surge in demand that led the system operators to activate both the power reserve and request consumption reductions.

The spring of 2010 commenced with severe rainfall and an increased availability of nuclear power, which in April resulted, for the first time in more than six months, in Sweden having a spot price that was below the system price on Nord Pool. Despite this, the price was somewhat higher than during the corresponding period of the previous year during the spring and summer. The price trend during the autumn and winter was predominantly linked to the prevailing shortages in the reservoirs, limited availability of nuclear power and higher demand for electricity. During November and December a prolonged cold spell caused the price to increase considerably.

Figur 6: Spot price trend in 2010



Source: Nord Pool

Higher Swedish generation and consumption in 2010

In 2010, total generation in Sweden was around 145 TWh, a rise of just over 8% in comparison with 2009, as is shown in Table 2. Nuclear generation rose by just over 11% compared with the previous year. Hydropower generation increased, despite major shortages in the reservoirs, by close to 1.4% compared to 2009. Wind generation increased by nearly 40% compared to the previous year. The gas-fired Öresund plant and other co-generation plants worked harder than usual in the cold weather and thus contributed to an increase in co-generation (simultaneous generation and heat production) by almost 24%.

Table 2: The Swedish electricity balance 2005 to 2010, TWh

	2005	2006	2007	2008	2009	2010
Domestic generation	155	140,3	145	146	133,7	145
Hydropower	72	61,1	65,5	68,4	65,3	66,2
Nuclear power	69,8	65	64,3	61,3	50	55,6
Other thermal power	12,3	13,3	13,8	14,3	15,9	19,7
Wind power	0,9	1	1,4	2	2,5	3,5
Domestic consumption	147,6	146,3	146,3	144,1	138,3	147,1
Network losses	12,4	11	11,9	11	10,2	11
Imports	14,6	20,5	18,5	15,6	16,4	17,6
Exports	-22	-14,4	-17,2	-17,6	-11,7	-15,6
Net output	-7,4	6,1	1,3	-2	4,7	2,1

NB. Negative values denote exports.

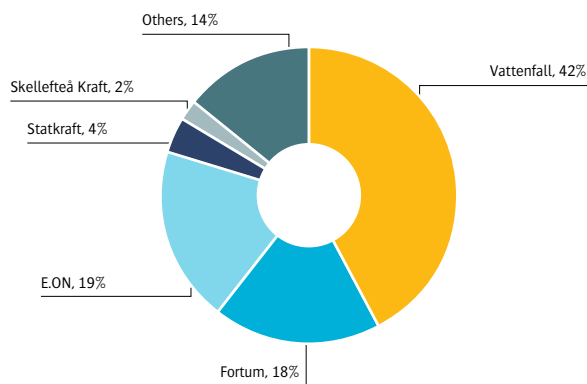
Source: SCB and Svensk Energi

As a consequence of the global recovery, total consumption in Sweden increased by 6% during the year. Industrial consumption increased by almost 7.6%. At the same time, domestic consumption of electricity rose by 2% during the year; thus it increased marginally and was virtually at the same level as in previous years. In the short term, domestic consumers have neither the same means nor the same incentive to cut consumption as do e.g., industrial users and companies.

Three major Swedish electricity producers

The five largest electricity producers in Sweden accounted for just over 85% of total generation in 2010, see Figure 7. Vattenfall, E.ON and Fortum together accounted for 80% of total electricity generation in Sweden in 2010.

Figure 7: The five largest Swedish electricity producers in 2010



Källa: Svensk Energi

Vattenfall is owned by the Swedish state and is the largest Swedish producer of electricity. In 2010, it generated 42% of Sweden's electric power, which was more than the total generation of E.ON Sverige and Fortum Sverige combined. The former is owned by E.ON, 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, while 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 somewhat.¹⁵

¹⁵Source: Svensk Energi.

The end-user market

The Swedish end-user market for electricity is a national one, and in the middle of the 1990s there were around 220 electricity supply companies. Since then, their numbers have fallen, due primarily to take-overs and mergers as many municipalities have decided to sell off their supply companies. In recent years, the number of such companies has remained virtually unchanged, and in 2009 there were 120 suppliers, a figure that had risen to 121 by December 2010. Of this number, around one hundred sell electric power to customers throughout Sweden, and more than half of them are part of a larger group of companies that also generate electricity. The total number of domestic customers on the Swedish end-user market at the end of 2010 totalled almost four million.

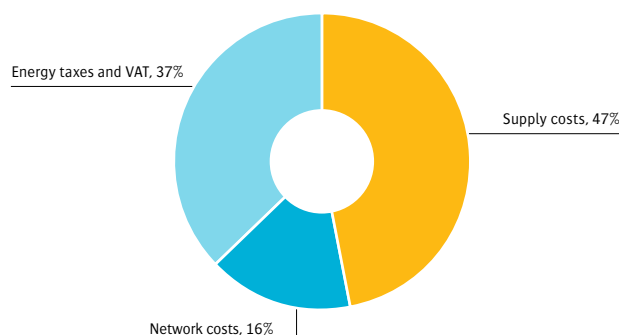
Electricity supply costs is the larger part of total electricity costs for private customers

Total consumer costs for electricity comprise:

- Supply costs
- Network costs
- Energy taxes and VAT

In the past decade, supply costs have accounted for an increasing proportion of the total cost of electricity. For a domestic consumer living in an electrically heated detached house, supply costs represented 47% of the total cost on January 1, 2010, as compared to 41% one year earlier. Distribution costs accounted for 16%, while energy taxes and VAT together accounted for 37%, as shown in Figure 8.

Figure 8: Total electricity costs for a domestic customer living in an electrically heated one family house as of January 1, 2011.



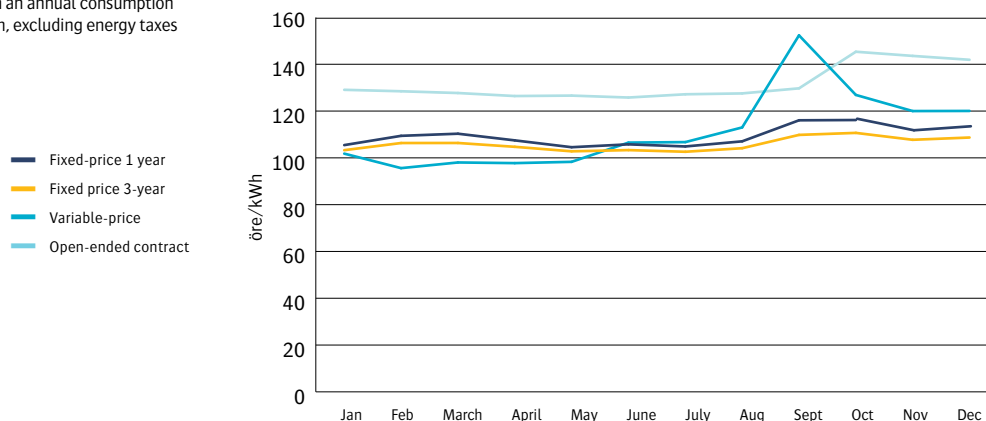
NB. The cost to a customer living in an electrically heated detached house not located in an area of Sweden where energy taxes are reduced. The prices refer to a one-year fixed-price contract and an annual consumption of 20,000 kWh. These figures have not been calculated in fixed prices.

Rising supply costs

Figure 9 shows the supply costs trend for the most common contract types for domestic customers with an annual consumption of 20,000 kWh. In 2010, those customers who had a fixed-price contract generally paid less for their electricity than those who this year had chosen a variable-price contract.

Figure 9: Supply costs trend for the most common types of contracts in 2010

N.B. Average comparative price for a customer with an annual consumption of 20,000 kWh, excluding energy taxes and VAT.



Source: The Swedish Energy Markets Inspectorate

Variable-price contracts still the most common type

Variable-price contracts are the most common type of electricity supply contract on the Swedish electricity market, but during 2010, the proportion of variable-price customers dropped somewhat. In December 2010, 28.8% of the customers belonged to this category compared with 29.8% the previous December.

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 2010, nearly 24% of all customers were in this category, a drop of two percentage points compared with the same month in 2009. 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 December 2010, around 19% of customers were on a three-year fixed-price contract, which is a marginal reduction in relation to 2009. By contrast, the proportion of one-year fixed contracts rose during the year by almost three percentage points to 16.7%.

Price clauses in supply contracts increasingly common

For the consumer, the introduction of bidding areas means that the price of electricity may vary from one area to the next. As investments in electricity networks and new generation are made in areas of high demand but short supply, the differences in the prices between different areas will probably fall. Since the supply companies at the present time do not know what the electricity purchase price will be after November 1, 2011, certain suppliers have inserted what is termed a price adjustment clause in their fixed-price contracts. This means that the supply company may adjust the contractual price both upwards and downwards during the current contractual period. Towards the end of 2010, there were approximately twenty companies among a total of 121 who were using such a price adjustment clause in sales of fixed-price contracts.

During 2011, the EI will follow up and analyse the effect on the customers of the division of Sweden into four bidding areas.

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

A total of over 1.5 million domestic customers were active on the electricity market during the year, as they either switched supplier or re-negotiated their contract with their existing one. This represents almost 34% of the total number of domestic customers on the Swedish electricity market.

The number of supplier switches in 2010 was almost 18% lower than in the previous year but almost 8% higher than in 2008. In all, around 11% of all domestic customers in Sweden switched their electricity supplier during the year. Apart from switching supplier, customers can be active on the market by re-negotiating their contract with their present supplier. In all, 24.4% of all domestic customers in Sweden did so in 2010, a drop of almost three percentage points in comparison with 2009. One reason why the number of customers switching supplier or re-negotiating their contract dropped somewhat during the year may be that more customers are now choosing a fixed-price contract as a result of last winter's price peaks.

A customer wishing to switch supplier signs a contract with the new supplier, who then reports this change of supplier to the customer's network company. Suppliers are obliged to report this switch and provide details of it to the latter company no later than the fifteenth day of the month before the month during which the switch is to take place, instead of one month before, as was previously the case. Customers are not charged for switching supplier.

This increased activity among the customers leads to more intense competition among the suppliers, which can squeeze prices and benefit the customers in the form of better offers.

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 2010, it registered around 380,000 visits; in total, there are around four million households in Sweden.

Current tax rules present obstacles to net charging

During the year, the term *prosumer* was discussed at both national and EU level. It means that customers with their own small-scale generation can be both their own producer and consumer. During the year, the EI studied the advantages and disadvantages of what is termed net charging¹⁶. This term refers to supply and network companies in their invoicing offsetting electricity consumed against that fed in during a specific period.

According to current legislation, net charging is incompatible with the tax rules currently in force. In order for it to be permitted and thus further increase the profitability of home generation, the report proposes that the government commission the Swedish Tax Agency to investigate the feasibility of amending the rules. As part of efforts to facilitate small-scale generation, it is also proposed that the government commission the Swedish Energy Agency to investigate the possibilities of small-scale electricity producers being themselves responsible on a monthly basis for the metering and reporting that form the basis for the allocation of electricity certificates.

Fewer complaints during the year

Every year, the Swedish Energy Markets Inspectorate receives enquiries and complaints from consumers on the electricity market, and in 2010, it replied to a total of 971 communications, which is fewer than in the previous year, consisting of complaints, general questions and feedback. The greater part of these communications comprised complaints and questions about network costs, questions relating to the Elpriskollen price comparison site, the retail electricity sector and also meter readings and records of power supplied. In addition to this correspondence, the EI also answers telephone enquiries and complaints. One possible explanation for the drop in the number of complaints is that the switch from annual to monthly meter reading has now become accepted, and that therefore there are fewer customers complaining about preliminary and final invoices.

The Consumer Electricity Advice Bureau also receives enquiries and complaints from consumers on the electricity market. The Swedish Energy Markets Inspectorate is one of the main bodies responsible for this Bureau,

¹⁶EIR 2010:23 Net debiting - proposals for new rules for users with their own generation.

which provides free information, advice and guidance on issues relating to the electricity market. In 2010, the Bureau received 3,200 questions and complaints, which was considerably fewer than in the previous year. Around 50% of the enquiries received were complaints and claims.

Work on a Nordic end-user market enters an intensive phase

For a number of years, there has been a political will for the establishment of a common Nordic end-user market for electricity, which would mean that the customers in the Nordic countries would enjoy a free choice of electricity suppliers across national borders.

During the autumn of 2010, the Swedish Energy Markets Inspectorate, together with its Nordic counterparts in NordREG, presented a concrete implementation plan to the energy ministers, which describes how a Nordic end-user market will be achieved by 2015. This has resulted in the formation of a project organisation, with MSEK 3.7 being allocated by the Nordic Council of Ministers in order to move this work forwards during 2011. NordREG is collaborating on this project with market actors including consumer representatives, in order to achieve an optimum market solution. Work in 2011 will focus primarily on how the market will be designed with a particular emphasis on a customer interface including an invoice model, information management and also customer protection. A common end-user market should enhance competition, which should in turn entail advantages for the customers, who will benefit from improved service and a wider range of products.

Measures to prevent market power

Several authorities monitor the electricity market

Several authorities and bodies collaborate in monitoring the Swedish and Nordic electricity market in order to use a variety of measures to ensure that they operate smoothly and to prevent market power. The Swedish Energy Markets Inspectorate has the overall responsibility for the Swedish electricity market and the application of legislation relating to electricity and the law pertaining to certain pipelines¹⁷. The Competition Authority is responsible for applying the rules relating to competition, while the Swedish Financial Supervisory Authority regulates those Swedish actors who, with the permission of the authorities, operate on the financial market. The Swedish Consumer Agency also plays a part in monitoring the electricity market, through such actions as drawing up standard general contractual terms and conditions for the entire industry in order to ensure fair contracts for the consumers on the electricity market. In addition, Nord Pool Spot and Nasdaq OMX operates an internal supervision of trading and corporate behaviour, while Nord Pool Spot, located in Norway, is supervised by the Norwegian regulatory authorities NVE (The Norwegian Water Resources and Energy Directorate) and the Financial Supervisory Authority of Norway.

¹⁷The Electricity Act (1997:857) and the law pertaining to certain pipelines (1978:160).

Areas of responsibility of the Competition Authority 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. The Act aims to eliminate and counter obstacles to effective competition in the production of and trade in goods, services and other necessities.

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 and the Competition Authority shall also contribute to effective competition by proposing amended rules and other measures to eliminate existing obstacles to competition. It is also charged with contributing funds for Swedish research in the fields of competition and procurement.

On January 1, 2010, the Competition Act²⁰ was supplemented so that the state, a municipality or a county council, or legal entities over which these have a dominant influence, can be forbidden to apply certain procedures in sales activities. 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.

Against this background, the Competition Authority took a positive view of the appointment by the government in the spring of 2008 of two negotiators with a remit to examine together with the owning companies the preconditions for restricting co-ownership within the Swedish nuclear power industry. Unfortunately, the negotiators found that it was not possible to reach agreement as to how to change the ownership of the Swedish nuclear

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

¹⁹Articles 101 and 102 of the Treaty of Lisbon.

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

plants so as to abolish co-ownership. It was against this background, among other factors, that in June, 2010 the EI was commissioned by the government to analyse a number of topical issues relating to supervision and transparency on the electricity market. Particular emphasis was placed on the analysis of the co-ownership of nuclear power.

As a result of the efforts by the EI, the owners of the nuclear power stations have agreed on common ethical rules for the industry for the exchange of information between the companies, and the owning companies have undertaken to report annually to the EI on compliance with these rules. Furthermore, independent observers have been given seats on the boards of directors of the nuclear power companies with a special remit to supervise compliance with these 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 the co-ownership of nuclear generation. A corresponding cutting back of other co-owned power facilities as well as a review of collaboration within the water regulation companies, according to the Competition Authority, ought to be undertaken in order to minimise contacts and exchanges of information between competing electricity producers.

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 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 regulations contain provisions on bidding on the spot market, and in order to supervise bidding and create confidence in price formation, it has a special market supervisory function that continuously follows trading. Consequently, all transactions are monitored 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 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 website. If and when an infringement of the rules is detected, there is a system of sanctions that include warnings, fines and the withdrawal of trading permits.

Since 2002, Nord Pool has operated a common market supervision for both physical trading (Nord Pool Spot) and financial trading (Nasdaq OMX).

With effect from the third quarter of 2011, separate market supervisory units will be established for both execution venues. This change is both a result of the gradual introduction at each execution venue of new products and markets with partially separated regulatory conditions and a natural step now that Nord Pool Spot and Nasdaq OMX no longer belong to the same group. However, close collaboration between these two market supervision units will still continue.

Greater transparency in Nord Pool Spot operations

A fundamental requirement for an efficient market open to competition is that all market actors simultaneously have access to all information that influences the market. Their confidence in the market is adversely affected in those cases where a number of actors have information advantages. This potential information asymmetry can distort competitive conditions to the benefit of actors that are vertically integrated, for which reason it is essential that the system that conveys market information²¹ has been developed in such a manner that all market actors receive information that influences prices, simultaneously and efficiently.

In 2010, the Swedish Energy Markets Inspectorate examined information transparency²² at Nord Pool and concluded that the management and design of its information distribution systems need to be reviewed and upgraded.

In December 2010, NordREG, the co-operative organisation for the Nordic regulatory authorities, chaired by the EI, proposed that a regulatory council be formed and its first meeting was held in the spring of 2011. Representatives of the regulatory authorities of Sweden, Finland, Norway, Denmark and Estonia, as well as the executive management of Nord Pool Spot, sit on this council, where Sweden is represented by the EI. Its functions include ensuring greater transparency for these regulatory authorities with regard to the bidding process at Nord Pool Spot.

²¹Urgent Market Messages (UMM).

²²EIR 2010:21 Monitoring and transparency on the electricity market - Measures to increase confidence in the electricity market.

A magnifying glass is positioned over a map of Europe. A white speech bubble with a drop shadow is centered over the map, containing text. The map shows various countries and cities, with a focus on the European continent. The magnifying glass is in the upper left corner, and the text bubble is in the center-right area.

Unlike natural gas grid operations, trading is done on a competitive basis, after a gradual transition from local monopolies to completely free competition. The last stage in opening up this market was taken on July 1, 2007, when the natural gas markets of most EU countries, including Sweden, became fully competitive. This market reform means that all Swedish natural gas customers have a free choice of supplier. Around 3.5% of national energy needs are met by natural gas.

The natural gas market

The natural gas grid

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 26,000 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 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.

Audit of gas network costs

The Swedish Energy Inspectorate regulates the gas network companies and approves the methods that they use to calculate their network costs. In setting costs 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 EI's preliminary audit of the methods that are the basis for the determination of costs aims to ensure that they are objective and non-discriminatory in accordance with the requirements of the Natural Gas Act (2005:403). The fairness of the network costs is audited by means of a retrospective follow-up.

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 report²³, which should reach the EI no later than seven months after the end of the financial year and provides the basis for its regulation.

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

²³The annual report shall contain a complete profit and loss account and a balance sheet for each respective accounting unit.

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 report²⁴ 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. It also proposes that the regulatory period should commence in 2013, i.e., as soon as it is deemed reasonable to assume that new legislation can come into effect.

Transmission limitations in the natural gas grid and available capacity

The actual available capacity of the Swedish transmission system is around 22TWh/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 14.00 hours on the day before the delivery day. Balance settlement by Svenska kraftnät is done on a twenty-four 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.

²⁴EIR 2010:14 Advance review of gas network costs.

Separation between transmission of and trading in natural gas

According to the Natural Gas Act, 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.

Metering and reporting customer consumption of natural gas

In 2008, the EI drew up new instructions, which regulate how natural gas consumption is to be metered and reported²⁵. One of the stipulations of these instructions is that the natural gas companies shall meter and report consumption by major customers at least once in any twenty-four hour period, at least once a month in the case of medium-sized customers and at least once a year for domestic customers.

During 2011, the EI was commissioned to produce an overall economic assessment of the costs and the benefit to the gas market and to the individual customer that would result in the long term from the use of smart meters. A report on this assignment is to be presented in March 2012.

²⁵EIFS 2009:1

The wholesale energy market

Just over thirty Swedish municipalities have access to natural gas, and in those where the gas grid is extensive, natural gas accounts for just over 20% of the final energy consumption, which is on a par with the average level for the rest of Europe. In recent years, natural gas consumption has risen sharply, due to a considerable extent to the coming into service of the Öresund facility in Malmö.

No extraction of natural gas in Sweden

There is no natural gas extraction in Sweden, which imports all the natural gas consumed there from Denmark via a pipeline that links these two countries. There are also pipelines from Denmark to the rest of Europe, which means that Sweden is linked to the continental system. In 2010, 30% of this natural gas was consumed by industry and 56% by co-generation plants, with housing accounting for around 5% and other commercial operations for the remaining consumption.

E.ON Sverige and Dong Energy are the two companies that sell natural gas on the Swedish wholesale market. Dong Energy is 73% owned by the Danish state, while E.ON Sverige is owned by E.ON. AG, which is the world's largest privately owned energy company. There are no figures available on their respective market shares in 2010, although there is no indication that there have been any major changes since 2006. In 2006, E.ON sold around 5.3 TWh on the wholesale market and thus had a 48% market share. However, this figure does not take into account that a part of this volume is sold to other companies in the E.ON Group, who in their turn have resold the natural gas to end-users. Table 3 shows the trend on the Swedish wholesale market.

Table 3: Trend on the wholesale natural gas market

	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

NB. Consumption is expressed in upper thermal value, which is around 10% higher than in lower thermal value.

Source: Svenska kraftnät and the Swedish Energy Markets Inspectorate

A changing market for biogas production

Biogas has a lower energy content and must therefore be enriched with propane before it can be injected into the gas grid. According to the current rules, the biogas producers must ensure that their biogas has the same energy content as the energy-rich Danish natural gas, which is due to the fact this is the only natural gas to be distributed in the Swedish grid. The requirement of propane enrichment is not unique to biogas but also applies to less energy-rich natural gas from Norway or Russia.

The adjustment that the biogas producers must currently make to be able to inject their gas into the natural gas grid makes it more expensive and thus less attractive to produce biogas for the grid compared with the production of, e.g., vehicle gas. Hence, the EI has been commissioned by the government to investigate the conditions that ought to apply to biogas producers who wish to inject biogas into the natural gas grid.²⁶

One possible way to increase the proportion of biogas on the Swedish market and simultaneously achieve more efficient use of the existing gas grid is to introduce a market-based support system for biogas production. This could be designed along the same lines as the existing system of electricity certificates, which implies the combination of a long-term planning objective with production support financed by costs on non-renewable forms of energy. The Swedish Energy Markets Inspectorate proposes that the government should take the initiative and study the introduction of such a market-based support system for biogas production.

²⁶EIR 2010:17 Changing market conditions for biogas production.

The end-user market

Sweden has around 37,000 natural gas consumers, of whom around 3,600 are business customers and the remainder are domestic customers. The number of end-users has declined in recent years, which is due primarily to a drop in the number of domestic customers in Gothenburg and Malmö.

A low number of market actors

Since the introduction of natural gas in 1985, the Swedish natural gas market has been characterised by a low number of actors. In 2010, there were five natural gas suppliers operating on this market, around 90% of which is accounted for by the three largest companies: E.ON, Dong Energy and Göteborg Energi

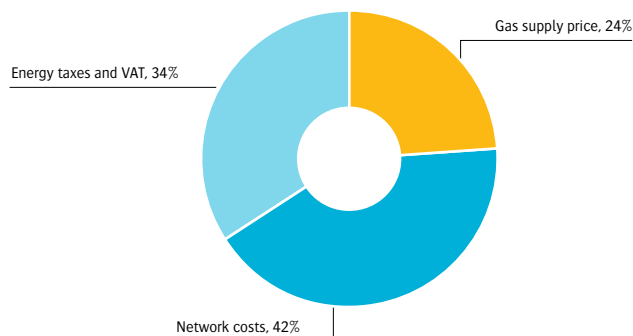
Network costs make up the largest part of natural gas costs for households

The total natural gas cost for households can be broken down into the following areas:

- Gas supply
- Gas grid
- Energy taxes and VAT

The proportion of the total gas costs attributable to the supply costs has increased since the previous year, and in 2010 it comprised 24% for a domestic customer, as opposed to 18% one year earlier. Network costs accounted for 42%, while energy taxes and VAT made up 34%, as shown in Figure 10.

Figure 10: Total natural gas costs for a domestic customer in 2010



Source: The Swedish Energy Markets Inspectorate

Table 4 shows the total natural gas cost for an end-user in 2010, for a number of types of users.

Table 4: Total natural gas cost to the customer in 2010 in öre per kWh at nominal prices

	Domestic gas	Heating and domestic gas	Central heating for at least ten households	Small industries	Medium-sized industries	Natural gas-intensive industries
Supply costs	38,5	28,1	27,9	36,7	34,2	32,7
Network costs	68,0	30,0	25,0	17,0	12,0	7,0
Taxes	22,7	22,7	22,7	4,8	4,8	4,8
VAT	32,3	20,2	18,9			
Natural gas cost	161,5	101,0	94,5	58,5	51,1	44,5

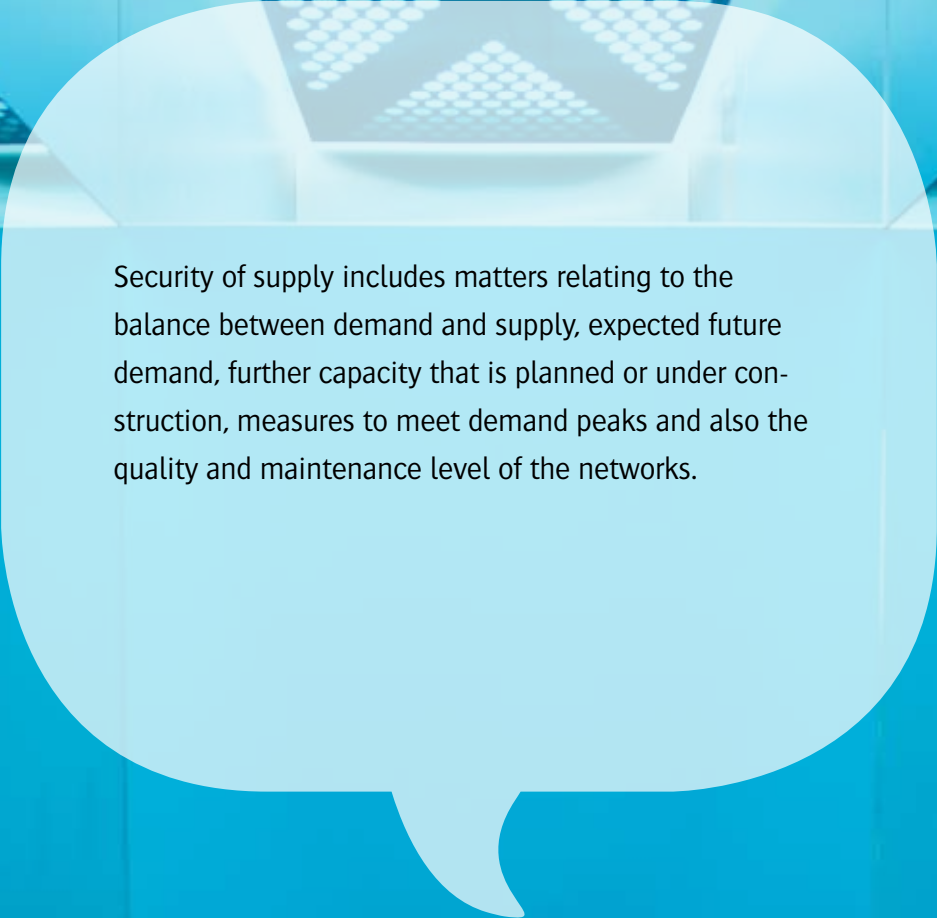
Source: SCB

Fewer customers switched natural gas suppliers during the year

In 2010, 266 households switched natural gas supplier, a 6.6% decrease over the previous year. The total number of switches continues to remain at a low level and is equivalent to almost 1% of the total number of domestic customers. The equivalent figure for non-domestic customers was 172, or just over 4.7% of all non-domestic customers.

The Swedish Energy Markets Inspectorate produced a study in 2008, that showed that only 13% of the domestic customers and 16% of the 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 supplier.

During the year, the EI held discussions with the Energigas Sverige trade association on extending the operations of the Consumer Electricity Advice Bureau to also encompass natural gas. The objective is to reach an agreement during 2011.



Security of supply includes matters relating to the balance between demand and supply, expected future demand, further capacity that is planned or under construction, measures to meet demand peaks and also the quality and maintenance level of the networks.

Security of supply

Security of supply – electricity

The security of supply in the Swedish power system is in general good, and it has never been necessary to resort to manual disconnection of consumption, which is the method that Svenska kraftnät must use in accordance with the Electricity Act should it not be possible by any other means to achieve balance between generation and consumption in the power system.

Installed generating capacity continues to increase

Installed generating capacity increased during 2010. In Sweden, investment in new generating capacity is undertaken on commercial grounds. The construction of a new generation facility does not require a permit from the Swedish Energy Markets Inspectorate, although such permits are mandatory in accordance with both the Environmental Code and the Planning and Building Act. In 2010, the generating capacity of Swedish power stations increased by 869 MW, while 470 MW was decommissioned. Hence, the net increase was 396 MW and the total capacity amounts to 35,701 MW.

Table 5: Installed generating capacity, MW

Power type	Installed generating capacity	Change since 2009
Hydropower	16 200	0%
Nuclear power	9 151	+2,4%
Other thermal power	8 187	-5%
Wind power	2 163	+39%
Total	35 701	+1 %

Source: Svensk Energi

The table shows the change in generating capacity by power type compared with the previous year. Hydropower had the highest capacity at 16,200 MW, followed by nuclear power at 9,151 MW²⁷. Other thermal power has declined since the previous year due to a drop in the number of condensing power stations, while capacity has increased within industrial co-generation and other combined heat and power facilities. The major part of the total net increase in generating capacity in 2010 came from wind power, which

²⁷This includes 1,200 MW at Oskarshamn 3 as the output has yet to rise to 1,400 MW.

contributed 603 MW, thereby increasing the installed wind power capacity by 39% compared with 2009.

In March 2011, the Swedish Energy Agency²⁸ published its short-term forecast²⁹, which covers the development of the Swedish electricity system during the period from 2009 to 2012.³⁰ It expects domestic electricity consumption to rise from 138 TWh in 2009 to 148 TWh in 2012, while Swedish generation in 2009 totalled 134 TWh, which, according to the forecast, will rise during the entire period and total 158 TWh in 2012. Its long-term forecast³¹ was published in the spring of 2011 and addresses the long-term development of the energy system up to 2030, by which date Sweden is expected to export 23 TWh, due to increased generation and a moderate rise in consumption. In 2030, generation is estimated to total 175 TWh and that contributed by thermal, wind and nuclear power is expected to rise, while consumption is expected to reach 152 TWh.

Power reserve activated

The installed power of the Swedish generating system has been falling 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 2003.³² 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. This law is a temporary measure that expires in March 2011. In February 2010, the government presented its draft law *The future of the power reserve*³³, which was largely based on the EI's study from 2008.³⁴ It proposed a gradual transition to a market solution during the period from 2011 to 2020 that envisaged the complete abolition of the power reserve by the end of the winter of 2019/2020.

During the winter of 2009/2010, there were three periods of severe strain on the power balance when Svenska kraftnät had to activate the power reserve and the highest level of consumption occurred on January 8, between 17:00 and 18:00.

For balance reasons the power reserve was not activated during the winter of 2010/2011. During this period, the highest level of consumption occurred on December 22 and totalled 26,690 MW. Sweden's highest level so far dates from February 5, 2001 when consumption reached 27,000 MW.

New transmission links

The Swedish electricity system has links to Norway, Finland, Denmark, Germany and Poland. In 2010, Sweden exported 12.9 TWh and imported 14.9 TWh, which resulted in net imports of 2.0 TWh. This can be compared

²⁸The Swedish Energy Agency is a government body that operates within different sectors of society to create conditions for efficient and sustainable energy consumption and a cost-effective Swedish power supply.

²⁹The Swedish Energy Agency, Kortsiktsprognos våren 2011. (ER2011:04)

³⁰The Swedish Energy Agency, Kortsiktsprognos våren 2011. (ER2011:04)

³¹The Swedish Energy Agency, Långsiktsprognos 2010. (ER2011:03)

³²The Power Reserve Act (2003:436).

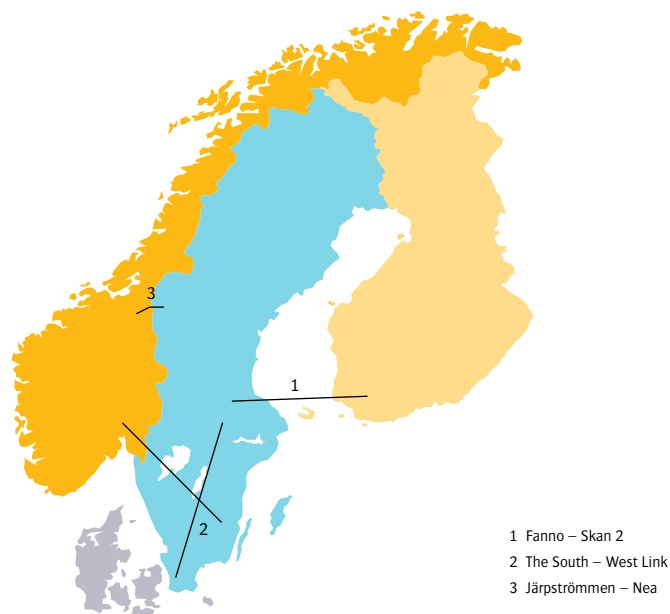
³³Draft law 2009/10:113 Effektreserven i framtiden.

³⁴The Swedish Energy Markets Inspectorate. Effektfrågan - Behövs en centralt upphandlad effektreserv?

with 2009, when net imports were 4.7 TWh. The principal reason for these net imports in the last two years is the low level of availability at the Swedish nuclear power stations.

Several projects are currently under way to increase the capacity and operational reliability of the Nordic power system. Figure 11 shows the projects in progress on Swedish territory.

Figure 11: Current projects to reinforce the Nordic grid



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 is estimated to come into service during the autumn of 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 1200 MW. From Jönköping, one link will run south to the Scania region and another, north to Hallsberg, while the third one 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 national grid company. The entire link is expected to be operational by 2015/2016.

The new 400 kV line between Järpströmmen in Sweden and Nea in Norway came into service in March 2010.

Svenska kraftnät is also planning a direct-current link, called NordBalt, between Sweden and Klaipeda in Lithuania. A permit application has been submitted to the Swedish Energy Markets Inspectorate, and a completed link is expected to be ready in 2015/2016.

Besides the projects mentioned above, there are a number of projects designed to strengthen the electricity networks in the major urban regions of Sweden. In addition, the Swedish Energy Markets Inspectorate is planning a grid link between Gotland and the Swedish mainland.

Security of supply in the electricity network

Electric heavy-current lines may not be built without a permit that is referred to as a network concession, which is granted by the Swedish Energy Markets Inspectorate or the government in the case of overseas links or lines in the national grid.

Security of supply is also affected by the type of lines used. The proportion of underground cables in local networks has risen in order to weatherproof these. 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, while in the case of lines at medium- and high-voltage levels this figure is around 58%³⁵.

In accordance with the requirements of the Electricity Act, consumers whose supply has been interrupted for at least twelve hours have the right to compensation from their network company. This requirement relates to outages that are within the sphere of responsibility of the network owner. Such compensation is standardised and shall be paid automatically. The Electricity Act also regulates the right to damages from the electricity network 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 provisions³⁶

³⁵According to data for 2009.

³⁶The Electricity Act (1997:857)

of the Electricity Act. These instructions were revised in 2010 in order to take into account such matters as the new advance regulation of network costs. 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 January 1, 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 costs. Table 6 shows outages in the local networks between 2000 and 2009³⁷. The figures state average values per customer and are divided into notified and unnotified outages.

Table 6: Outages in the local networks due to internal network faults, average values per customer

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
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
Unnotified outages	0,88	1,03	0,97	0,90	0,89	1,26	1,05	1,49	1,04	0,88
Average outage duration per customer (in minutes)										
Notified outages	27	27	29	27	25	32	22	22	26	20
Unnotified outages	89	128	123	118	72	891	88	307	104	63

Source: The Energy Markets Inspectorate

The electricity network companies gave a voluntary undertaking in 2001 to weatherproof all 57,000 kilometres of uninsulated conductors through the forests. The violent storm of January 2005 led to an increase in the rate of investment, and by the end of 2006, around half of these investments had been completed. Weather protection of the electricity networks is expected to be completed in 2011, when the functional requirement³⁸ of the Electricity Act comes into force.

With effect from 1 January 2006, the electricity network companies are obliged in accordance with the Electricity Act to undertake risk and vulnerability analyses and also to draw up an action plan 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 requirement 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.

³⁷Latest available statistics.

³⁸In 2005, the Riksdag introduced a functional requirement that stipulated that outages must not last longer than twenty-four hours. This requirement will apply with effect from 2011 and will be applicable to events that the network owners are legally obliged to monitor.

The EI has decided on instructions relating to the requirements that shall be fulfilled in order to ensure good transmission quality as stipulated by 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 will be issued in 2011.

Security of supply – natural gas

Although, historically, the security of supply has been high, the Swedish natural gas market can still be considered vulnerable in both the long and the short term. The fact that there is only a single supply point and also that domestic natural gas production does not exist renders the market susceptible to short-term external disruptions. In a longer perspective, Danish gas supplies will decrease as the supply of gas in the Danish gas fields starts to drop.

Increased natural gas consumption

Total natural gas consumption has increased in Sweden since its introduction in 1985. In 2010, 19 TWh of natural gas was consumed, which is just over 5% more than in the preceding year. Most of this increase is due to the coming into service in the autumn of 2009 of the Östersund co-generation plant in Malmö. Owned by E.ON, it has been modernised and is now a gas-fired co-generation plant with a production capacity of 440 MW of electricity and 250 MW of heat. Natural gas consumption is expected to rise in the coming years as a number of new plants are planned.

A number of projects associated with the Swedish natural gas system with regard to extraction, production, and other operations are under way, of which the following can be mentioned:

- A gasification plant for bio-fuel is planned in Gothenburg, 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 bio-fuel that is intended to be located in conjunction with the existing natural gas system. Once in service, in 2016, it may deliver 200 MW of gas, and a first preliminary investment decision may be taken in 2011.
- An LNG reception terminal is planned in Gothenburg, primarily in order to supply ships with LNG as a fuel. The plan includes a gasification plant with a possible capacity of around 200 MW that can supply gas to natural gas consumers, which is expected to be ready by 2013.

A natural gas storage facility

Sweden does not have a storage facility for seasonal equalisation of natural gas consumption, although there is a smaller one that can equalise consumption peaks that is owned by E.ON Sverige and is located in the south of the province of Halland. The volume of stored gas as of February 28, 2010, was 0.01 billion cubic metres, which had fallen to zero by October 1. The daily withdrawal capacity varies from 0.6 to 0.9 million cubic metres, equivalent to between 10% and 20% of the gas requirements on the Swedish market under winter conditions. This variation is due to the pressure prevailing in the facility and in the grid, 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 a new supply in the natural gas system

All the natural gas consumed in Sweden is imported from Denmark via the pipeline that links these two countries. There are also pipelines from Denmark to the rest of Europe, which means that Sweden is linked to the continental system. The Swedish market is concentrated on the west coast along the pipeline network that extends from Trelleborg in the south to Stenungsund in the north with a branch pipeline to Småland. See Figure 12.

Figure 12: The Swedish natural gas network



Source: The Swedish Gas Trade Association

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. The following plans for a new supply for the Swedish natural gas system are under way:

- During the spring of 2010, the EI approved the government's granting of a permit to the Norwegian state company Gassco and Swedish Swedegas to build and operate a new pipeline, to be called Skanled, between Norway, Sweden and Denmark. The Skanled project envisages the possible laying at sea of a natural gas pipeline from southern Norway to the Swedish west coast. Skanled is an industrial collaboration that is being planned by Swedish, Norwegian and Danish actors. It is planned to connect to the Swedish natural gas network via three branch pipelines on the West Coast. This project is currently mothballed due to the uncertain economic situation but it may be resumed once conditions improve. However, efforts to obtain various permits will continue in order to facilitate a smooth resumption of the project.
- 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 kilometre-long gas pipeline commenced in 2010, and the first pipeline is expected to come into service in 2011, followed by the second pipeline in 2012. Once this happens, total annual capacity will be fifty-five billion cubic metres. 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. 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 forty years, while certain items of monitoring, control and regulation equipment are expected to have a useful life of between fifteen and twenty 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	Interval	Procedure
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 assured.

The EC Gas Supply Directive³⁹ has been incorporated into Swedish legislation by means of amendments to the Natural Gas Act. These new provisions mean that the actors on the natural gas market shall plan for and take necessary measures to secure the natural gas supply, that special minimum requirements for a secure natural gas supply for consumers are to be introduced and also that a national plan for crisis situations in the area of natural gas is to be drawn up.

In accordance with the Natural Gas Ordinance (2006:1043), natural gas companies shall, when planning and implementing necessary measures in accordance with the Natural Gas Act, secure the consumers' supply of natural gas in at least the following instances.

³⁹The Gas Supply Directive (2004/67/EC).

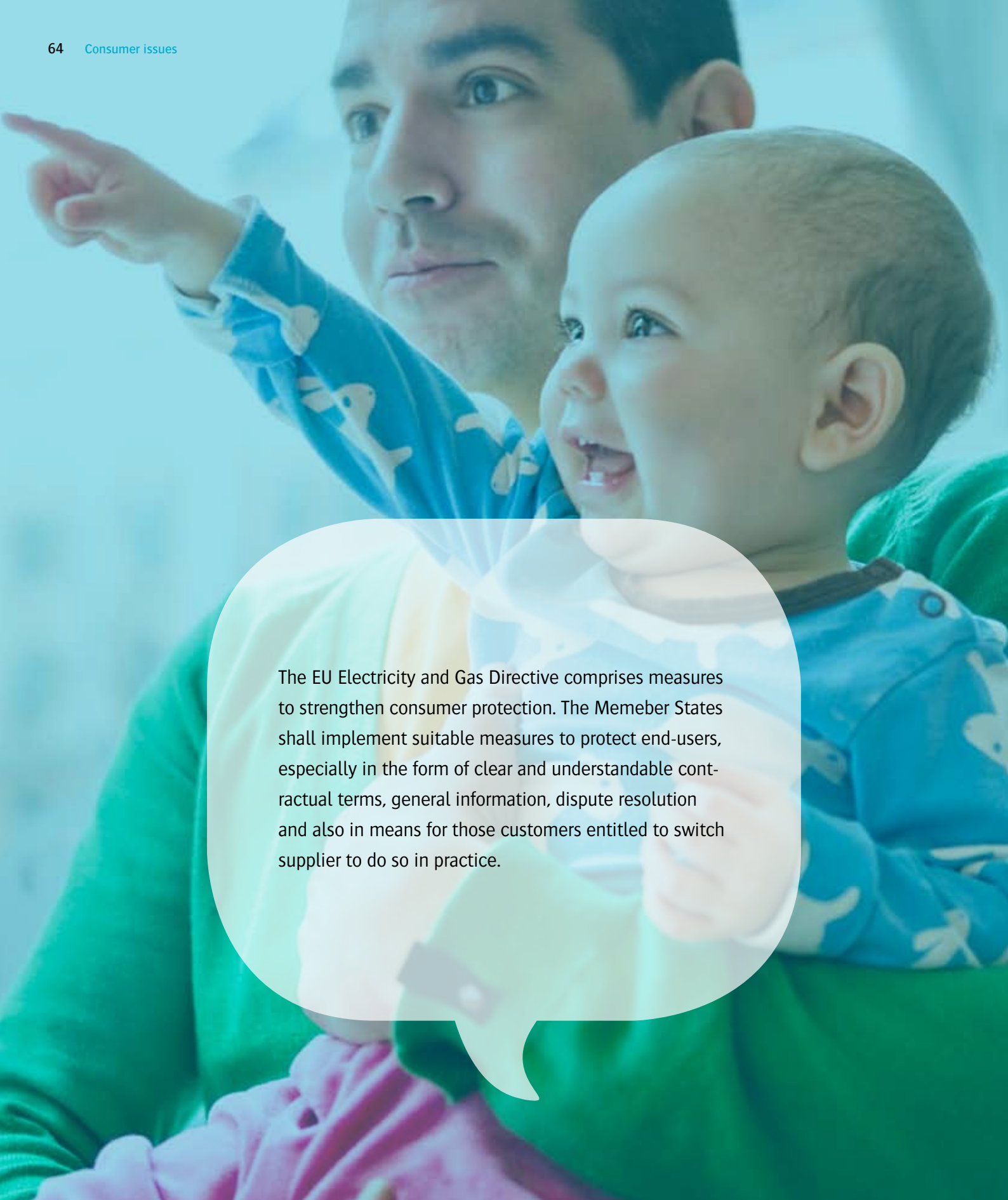
- In the event of a partial disruption of the national natural gas supply not exceeding twenty-four hours.
- Annually during the winter period from and including December, up to and including February.
- During periods where the temperature is four to five degrees below the normal winter temperature.

Owners of a natural gas pipeline, storage facility or gasification plant shall implement planning and other measures for crisis situations relating to the operation and security of their own installations. These measures shall comprise both crisis and information management in the event of a crisis situation as well as regular assessment of vulnerability and threat patterns. Owners shall draw up a plan for crisis and information management in the event of a crisis 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 latter drew up a national plan for crisis 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.

Extent of long-term agreements on gas supplies

There is no obligation for natural gas companies to report agreements on gas supplies that have been concluded, and the Swedish Energy Agency has therefore not had any sight of such agreements.

A photograph of a man and a baby. The man is in the background, looking to the left and pointing with his right hand. The baby is in the foreground, also looking to the left. The image has a light blue tint. A white speech bubble is overlaid on the bottom right of the image, containing text.

The EU Electricity and Gas Directive comprises measures to strengthen consumer protection. The Member States shall implement suitable measures to protect end-users, especially in the form of clear and understandable contractual terms, general information, dispute resolution and also in means for those customers entitled to switch supplier to do so in practice.

Consumer issues

Electricity suppliers obliged to state the origin of the electricity

Electricity suppliers are obliged by the Electricity Act to provide consumers with details of the origin of the electricity either on or in connection with their invoices and in advertising material. This involves information on the proportion of each energy source in the generation of the electricity sold by the supplier during the previous calendar year. In addition, the consumers are also to be given information on the environmental effects in the form of carbon dioxide emissions as well as on the quantities of nuclear fuel waste resulting from the generation of the electricity sold.

In 2010, the EI was commissioned to attempt to bring about a voluntary industry solution for co-ordinating the regulatory mechanisms for guarantees of origin and the origin marking of electricity, within the framework of existing regulatory mechanisms. Should this not prove feasible, proposals for a developed regulatory mechanism for the origin marking of electricity shall be drawn up by co-ordinating the regulatory mechanisms for guarantees of origin and the origin marking of electricity.

The premises behind these efforts are as follows:

- Electricity customers are to be given better and more reliable conditions than those currently available to evaluate the degree of environmental impact of their purchases of electricity. Correct details of its origin shall enable customers to make active choices that will enable them to choose electricity which has the lowest environment impact.
- A new Swedish regulatory mechanism is to be harmonised to the greatest possible extent with similar mechanisms under development in the Nordic countries and the EU. Ongoing international standardisation efforts and studies within the Nordic collaboration are also to be taken into account.
- Administrative costs for the actors involved are to be kept as low as possible. Additional regulatory mechanisms and procedures are to be designed in as cost-effective and simple a manner as possible on the basis of the primary objective of these mechanisms.

This assignment is to be performed in consultation with the Swedish Energy Agency, Svenska kraftnät and the Consumer Agency and shall be reported to the government no later than October 1, 2011.

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. Since this legislation does not regulate in detail all aspects of the energy market, the General Contractual Terms and Conditions provide supplementary protection. These have been agreed upon in negotiations between the Swedish Consumer Association and the trade organisation known as Swedish Energy and have the same status as trade practice, while Swedish Energy encourages its member companies to provide their customers with details of these terms and conditions, which are applied by the majority of electricity suppliers and network companies.

The Swedish Energy Markets Inspectorate follows the general price trend but does not exercise any regulation of electricity or gas supplier costs. However, electricity suppliers are obliged to provide details of prices and supply conditions appertaining to the supply of electricity to consumers. These details form the basis for the electricity price comparison website (www.elpriskollen.se) provided by the EI. It helps consumers to find information on the most important terms and conditions of supplier contracts, such as period of notice for termination of the contract, any costs for premature termination and whether the contract is renewed automatically when it expires. In addition, the Consumer Agency, municipal consumer advisors and the Consumer Electricity Advice Bureau also provide information about these general terms and conditions.

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