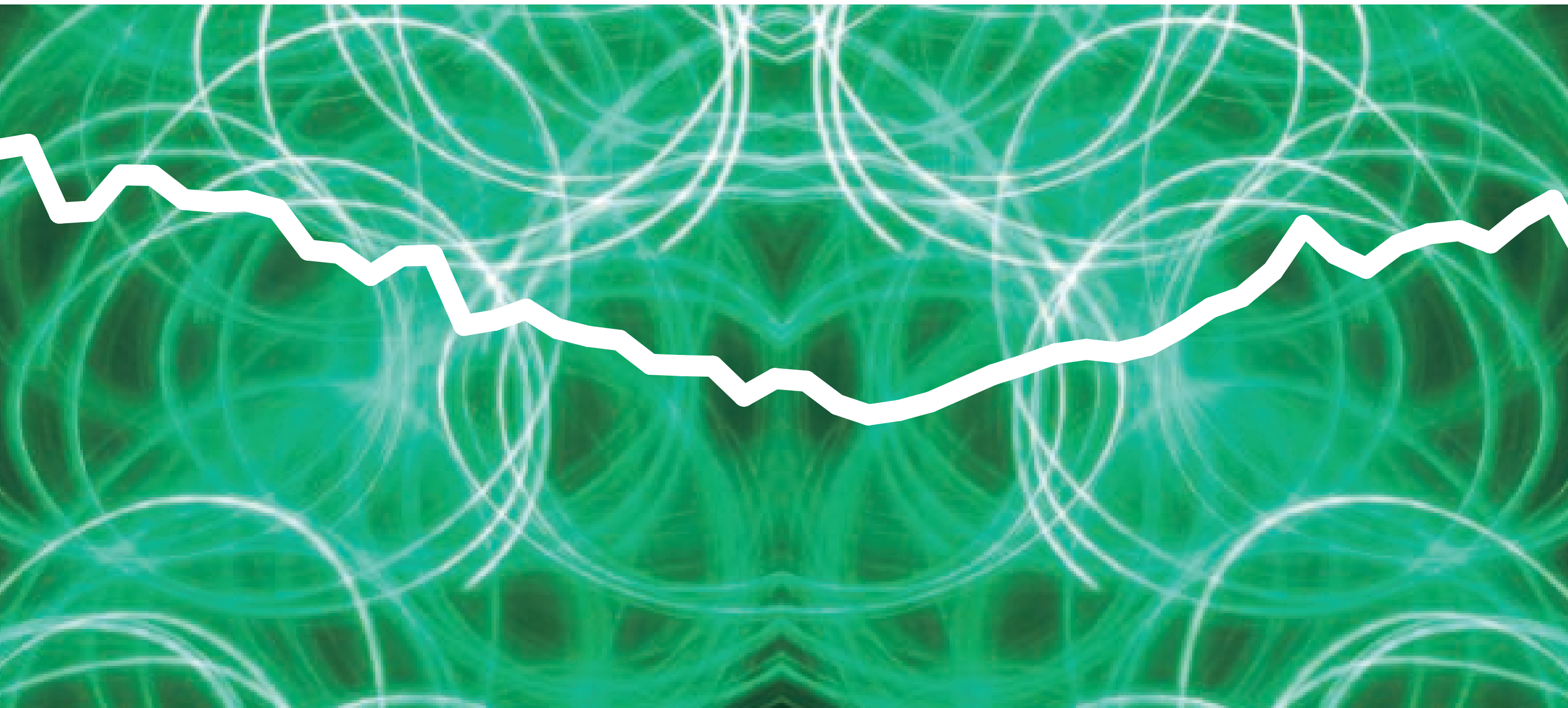
The electricity year 2004



The year in review

RESTORED WATER BALANCE AND RECORD PRODUCTION OF NUCLEAR POWER

At the end of the year the Nordic reservoirs returned to more normal levels after two years of a periodically severe water deficit, bringing down electricity prices on the Nordic power exchange Nord Pool during the autumn. At the same time, the eleven Swedish nuclear reactors generated a record volume of 75 TWh (billion kWh).

Hydropower production on an annual basis was lower than normal. The spring flood started early and was intensified by a period of unusually mild weather. When the warm temperatures later gave way to cold, the spring flood ceased and gave rise to fears of a continued water deficit that were relieved by the arrival of the summer and autumn rains. At the beginning of the year the Nordic reservoirs were only 49 percent full, but by year-end had reached a more normal 65 percent.

Sweden's aggregate hydropower output in 2004 was 59.5 TWh (52.9 in 2003), around ten percent lower than normal but 12 percent higher than in the previous year. Wind power production continued to rise in 2004 and contributed close to 0.9 TWh (0.6). Table 1 shows the statistics for 2004.

Nuclear power production amounted to 75 TWh (65.5), the highest annual value of all time. Other thermal power accounted for 13.1 TWh (13.6) and the country's total electricity output was 148.5 TWh (132.5), of which just over 4 percent was biomass-based.

The major Swedish import requirement in 2003 (12.8 TWh) shifted to a weak net export in 2004 (2.1 TWh), mainly due to a combination of abundant nuclear power and a modest increase in electricity consumption. As a whole, however, the Nordic region remained a net importer in 2004, with a combined net inflow of 12 TWh. In spite of the improved water balance and record nuclear power output in Sweden, the Nordic countries are dependent on imports from Russia, Germany and Poland.

Total electricity consumption in Sweden reached 146.4 TWh (145.3), a slight increase over 2003. Nordic consumption also rose and amounted to 390.9 TWh (380.9).

Table 1

PRELIMINARY STATISTICS FOR 2004

Source: Statistics Sweden

Supply	**2004 prel TWh**	**2003 TWh**	**Change from 2003**
Hydropower	59.5	52.9	12%
Wind power	0.9	0.6	35%
Nuclear power	75	65.5	15%
Other thermal power	13.1	13.6	-3%
Total electrical power	**148.5**	**132.5**	**12%**
Net import/export	-2.1*	12.8	
Total domestic electricity consumption	**146.4**	**145.3**	**0.7%**
Temperature-adjusted electricity consumption	147.4	146.2	1%

** A negative value is equivalent to export*

LOWER PRICES AND INCREASED TRADING VOLUME ON NORD POOL

The year's higher runoff contributed to a drop in prices on Nord Pool (Diagram 1). The average spot rate in the Swedish price area during 2004 was 25.6 öre/kWh, compared with 33.3 öre/kWh in 2003 and 25.2 öre/kWh in 2002.

In the summer of 2004 electricity prices on Nord Pool were more or less stable at around 30 öre/kWh due to a prolonged dry spell – the driest in 50 years. The Norwegian and Swedish reservoirs did not recover until heavy rains arrived at the end of the year. By December the price had fallen to 23 öre/kWh as a monthly average.

As shown in Diagram 2, trading on the spot market rose by 40 percent to 167 TWh and financial trading (forward market) increased by 8 percent to 590 TWh. The total volume of cleared bilateral contracts fell marginally to 1,207 TWh (1,219 TWh in 2003).

Lower prices are one explanation for the increased trading volume in 2004. While the previously high and volatile prices caused players to reduce their exposure in line with financial conditions and risk policies, the current lower prices have provided scope to hedge larger volumes with roughly the same available amount of money.

DIAGRAM 1

Nord Pool electricity spot prices in 2004 - Stockholm price area

Source: Nord Pool

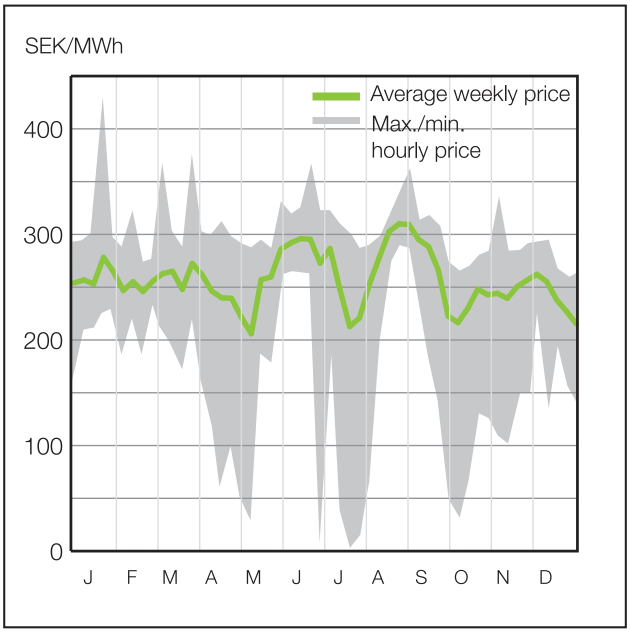
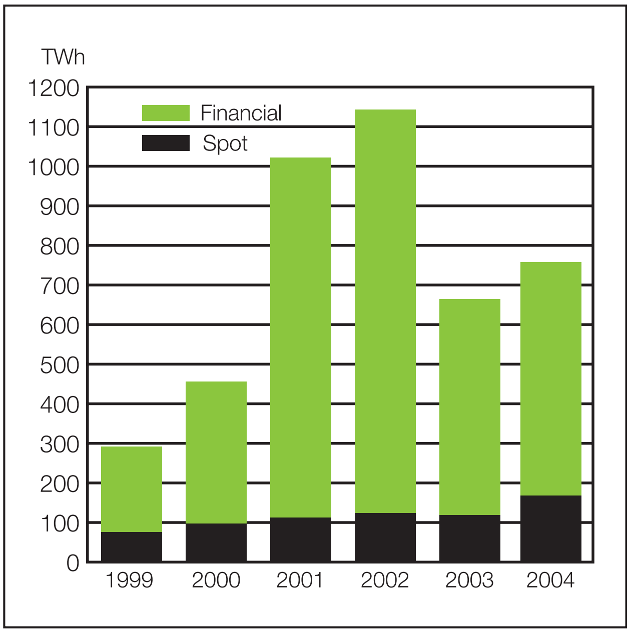


DIAGRAM 2

Trading on the Nordic spot and financial markets

Source: Nord Pool



RISING COST OF COAL AFFECTED ELECTRICITY PRICES

One key factor influencing electricity prices in the Nordic market is the amount of precipitation. The supply of water in the Nordic power system determines the extent to which the coal-fired condensing power plants in our neighbouring countries need to be used. Low precipitation or temperatures mean greater utilization of coal-fired power, while the opposite is true in years with ample runoff and high temperatures. This, in turn, affects the average price over the year.

Consequently, prices on Nord Pool are closely linked to production costs in coal-fired condensing power plants. In 2003 the Nordic electricity market was affected by rising coal prices due to both price hikes for the coal itself and increased transport costs. At its peak the coal price doubled to more than 80 USD/tonne, compared with the normal 35-40 USD/tonne.

In recent years Norway and Sweden have invested very little in new power production and the Nordic countries have become increasingly dependent on Finnish and Danish coal-fired power and imports from other countries – primarily Russia, Poland and Germany. In 2003 the net import for the Nordic region was equal to nearly 5 percent of its total electricity requirement, and for Sweden close to 9 percent. As a result of this growing deficit, power prices on the continent are having a growing impact on the Nordic market.

STABLE INDUSTRY STRUCTURE

Structural changes during the year were essentially limited to completion of the activities started in 2003.

In January Sydkraft completed its bid for Graninge, whose share was delisted from the Stockholm Stock Exchange in February. According to an agreement in principal between Sydkraft's largest shareholders – Norwegian Statkraft and German E.ON – Statkraft purchased hydropower production equal to 1.6 TWh/year in Graninge and the right to use the Graninge brand.

In May Fyrstad Kraft became a wholly owned subsidiary of Östkraft. Following the merger, Östkraft has eight co-owners: Tekniska Verken i Linköping, Växjö Energi, Katrineholm Energi, Mjölby-Svartådalen Energi, Trollhättan Energi, Uddevalla Energi, Oxelö Energi and Borgholm Energi.

The merger between the Lunds Energi group and Ringsjö Energi was carried out in June. Ringsjö Energi will retain the status of subsidiary with its own brand. The new Lunds Energi group will have some 160,000 customers and annual electricity sales of 2.6 TWh.

Pursuant to an agreement signed during the year, Sydkraft became sole owner of Bråvallakraft and Tekniska Verken i Linköping took over Sydkraft's holding in Mjölby-Svartådalen Energi.

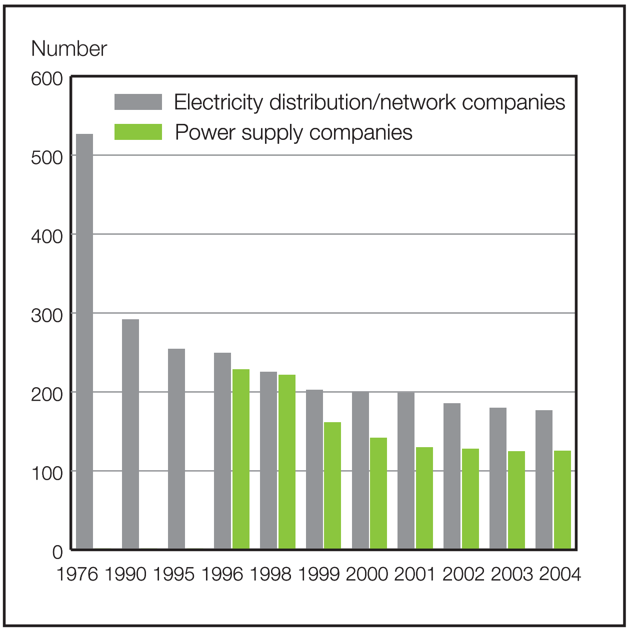
A company named Dala Nät was formed to study the potential for a merger between the network companies in Malung, Leksand-Rättvik, Gagnef, Enviken and Säter.

Changes in the network and power supply

DIAGRAM 3

Changes in the number of network and power supply companies since 1976

Source: Swedenergy



companies are shown in Diagram 3. At the end of the year there were 175 network companies and 124 power supply companies.

NORDENERGI IMPROVING THE NORDIC ELECTRICITY MARKET

Nordenergi is a collaborative body for the power industry's national organizations – Swedenergy, the Norwegian Electricity Industry Association, the Finnish Energy Industries, the Association of Danish Energy Companies, and Samorka in Iceland – whose objective is to promote development and harmonization of the Nordic electricity market. Central issues include the elimination of all remaining transmission bottlenecks between countries and management of peak loads during the coldest winter days. For more information visit www.nordenergi.nu.

Prior to the meeting of the Nordic energy ministers in Iceland on 2 September, Nordenergi urged the ministers to take full responsibility for ongoing efforts to develop the Nordic electricity market. At the meeting in Akureyri, it was concluded that the Nordic electricity market is functioning well and that the harmonization process should be continued. In the subsequent Akureyri declaration, the Nordic system operators were assigned the task of investigating how functions for system responsibility, financing and organization of Nordic investments in the transmission networks and joint management of system capacity can be further coordinated.

The escalating Nordic dependency on imported power is creating upward pressure on electricity prices. But while electricity consumption continues to rise, few new power plants are being built. In view of these factors, securing the Nordic region's future energy supply will be a major challenge.

SURVEY SHOWS SATISFIED CUSTOMERS

Customer activity in the electricity market is growing steadily. According to a TEMO survey in November, more than half of all electricity customers (54 percent) have either changed electricity supplier or renegotiated prices with their existing supplier.

The majority of all respondents are satisfied with their current electricity supplier, according to 77 percent of those who have changed supplier, 69 percent of those who have renegotiated their electricity price and 59 percent of those who have not taken active measures.

The results of the survey indicate a rising level of activity among electricity customers in the market. The share that have changed supplier is highest in the big cities, while loyalty to the old supplier is stronger in rural areas where it is more common to renegotiate prices. The share of electricity customers with no intention to actively change supplier has continued to decrease and had dropped by four percentage points in the autumn survey to 32 percent.

Attitudes towards the electricity market reform, i.e. the deregulation of the electricity market that started in 1996, were also predominantly positive (67 percent). However, overall attitudes towards the electricity market have deteriorated further. Only 19 percent claimed to be positive in any sense, compared with 28 percent in the survey conducted earlier in the year.

The political year

ELECTRICITY AND GAS MARKETS COMMISSION

In 2004 the Electricity and Gas Markets Commission completed the ongoing inquiry that started in 2003. The Commission's task was twofold, and consisted of determining how to incorporate the EU's new electricity and natural gas directives into Swedish law, as well as studying competition and customer influence in the electricity and natural gas markets.

With regard to legislative incorporation of the directives, the Commission recommended that Sweden waive the EU's right of exemption for companies with fewer than 100,000 customers from the rules against cross-subsidization between distribution/network companies and power suppliers. Nonetheless, at the end of the year the government submitted a Legislative Council statement whereby network companies with fewer than 100,000 customers are not required to implement a separation of management and decision-making.

The Commission's final report was presented at the beginning of January 2005 and will be circulated for comment during the spring. The Commission's overall conclusions are that the electricity market is functioning well and that price formation is sound with regard to both physical and financial trading on Nord Pool. The Commission felt that that there were natural explanations for the high prices on Nord Pool during 2002 and 2003.

DECISION TO CLOSE BARSEBÄCK 2

Negotiations between the power industry and government representative Bo Bylund were broken off in October 2004. Immediately afterwards, the government formally decided to close reactor 2 at Barsebäck during 2005. The decommissioning date was later set for 31 May.

EMISSIONS TRADING – SWEDISH POWER PLANTS AT A DISADVANTAGE

When Sweden's allocation plan for CO_2 emission quotas was presented in April 2004, it was clear that the energy sector would be disadvantaged in favour of base industries. Swedenergy has expressed its dissatisfaction with the allocation plan in many different contexts, including a request to the EC competition authority for an inquiry into and correction of the unjust allocation of emission allowances to the Swedish energy sector. However, the request was denied and the EC has accepted the proposed allocation plan.

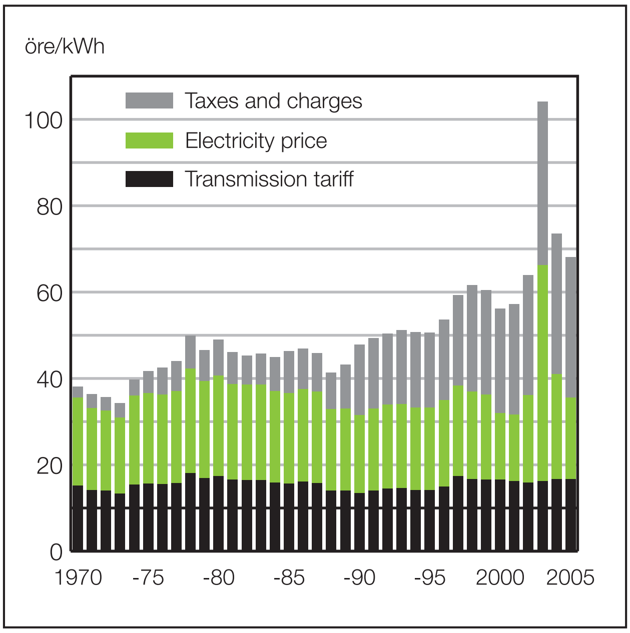
The most serious consequences of this allocation are linked to the implications for new electricity and CHP plants. Based on the national allocation plans, Swedenergy has calculated a few examples that illustrate emission allowances for new power generation facilities:

- A new natural gas-fired CHP plant in Sweden using the best available technology is allocated only around 60 percent of the necessary emission rights, while a similar plant in Denmark is allocated 90 percent, in Finland 100 percent, in Germany 120 percent and in Poland at least 100 percent.
- A new natural gas-fired condensing power plant using the best available technology is not allocated any emission rights at all if located in Sweden, while the same plant in Finland would be allocated 100 percent, in Denmark around 70 percent, in Germany 100 percent and in Poland 100 percent of the required emission allowance.

DIAGRAM 4

Breakdown of total electricity price for a detached home with electrical heating and a variable rate contract, 1990 prices

Source: Swedish Energy Agency and Statistics Sweden



Over time, this could create a situation where new power production capacity is not built in Sweden but is instead located in our neighbouring countries. Work has already been started on the allocation plan for the next trading period and intensive efforts are under way to ensure that this allocation is more just, particularly for new plants.

It is still unclear how the carbon dioxide tax will be dealt with. The Flexmex2 delegation has proposed that carbon dioxide tax be abolished in Sweden for those participating in the emissions trading system, with the exception of district heating production, but no definite decision has yet been made on this subject. In the spring budget for 2005, it is stated that this issue will be resolved in a special government bill to be put forward in the spring of 2005.

MARKET REFORM COMMISSION STUDY ON DEREGULATION

The task of the Market Reform Commission was to evaluate the long-term effects of deregulation in the telecom, electricity, postal, domestic aviation, taxi and rail markets on consumers, trade and industry, the labour market and socioeconomic conditions. The Commission's final report was presented at the beginning of January 2005 and will be circulated for comment during the spring.

However, at a press conference in September 2004 the Commission claimed that deregulation of these markets has led to significant price increases, a move that set off a heated debate and earned sharp criticism from all sectors covered in the study. The power industry argued, in particular, that no consideration was given to factors such as a 50-year low in reservoir storage levels. Since then, the conclusions in the Commission's report have been toned down considerably.

NETWORK PERFORMANCE ASSESSMENT MODEL DEPLOYED

The new Network Performance Assessment Model (NPAM) was applied for the first time in 2004. Based partly on calculations according to the model, the Swedish Energy Agency selected some 40 companies for in-depth review. At year-end the Agency had not yet issued any final rulings on tariff levels in 2003 and it will not be clear how the model is to be applied in tariff regulation until some time during 2005.

ENERGY TAX RAISED

The so-called "green tax shift" has led to further increases in energy taxation. On 1 January 2004 the Swedish energy tax was raised by 1.4 öre/kWh to 24.1 öre/kWh for the majority of users. For certain municipalities in northern Sweden, the energy tax was set at 18.1 öre/kWh. Furthermore, a decision was made during the year to raise this tax additionally to 25.4 öre/kWh with effect from 1 January 2005, after which the combined energy tax and VAT will amount to 31.8 öre/kWh. Added to this is the green certificate charge of around 3.2 öre including VAT. Given the price situation at the beginning of 2005, this means that around half of the cost paid by electricity customers goes directly to the public treasury.

Prior to 1975, power tax was charged based on the value of the electricity supplied, and not in terms of the öre/kWh model that was introduced in the mid-1970s. Since then, VAT was introduced on top of the total electricity price in 1990 and major tax hikes have been made in recent years. The energy tax has more than doubled over the past ten years which, for household customers, has offset the competitive pressure on electricity prices resulting from reforms in the electricity market.

Development of electricity prices and the breakdown for a detached home with electrical heating and a variable rate contract is shown in Diagram 4. In this case, the tax share (including charges) has increased from 7 to 46 percent of the price paid by customers since 1970.

PROPOSED TAX ON HYDROPOWER

In the spring of 2004, the Property Tax Committee proposed that the hydropower tax in Sweden be raised by a further SEK 700 million to cover the reduction in wealth tax for private individuals.

Later in the year, several different commissions called for increases in property tax that would raise total tax revenue from the hydropower sector to nearly SEK 1,600 million. At present, the net tax levy on the energy sector is around SEK 60 billion. Since the mid-1990s Swedish electricity customers have seen a tripling of electricity taxes.

Sweden's total energy supply

ENERGY SUPPLY

Sweden's energy requirements are covered partly by imported energy sources – mainly oil, coal, natural gas and nuclear fuel – and partly by domestic energy in the form of hydropower, wood and peat, as well as wood waste from the forest products industry (bark and lignin). Development of the energy supply since 1973 is shown in Diagram 5. The most significant changes between 1973 and 2004 are that the percentage of oil in the energy mix has fallen from 71 to just over 25 percent and that nuclear power has increased from 1 to nearly 40 percent. Sweden's total energy supply in 2004 amounted to a preliminary 617 TWh, compared with 580 TWh the year before.[1)]

ENERGY CONSUMPTION

Steady growth in demand for goods and services is generating increased demand for energy. Diagram 6 shows energy consumption in relation to gross national product, GNP (kWh/GNP-SEK). The generally accepted international calculation method based on the energy content of the fuel is now applied, since the Swedish statistics previously disregarded conversion losses in the nuclear power plants. Although it is clear that energy consumption calculated according to the older Swedish method has fallen since 1973, not until recent years has it started to decrease according to the international method.

In absolute terms, energy consumption among end-users has been relatively constant since 1973. At the same time, consumption in relation to GNP has fallen by almost 40 percent. This is partly due to increased usage of processed energy in the form of electricity and district heating, and partly to improved energy-efficiency in general. The oil share of energy usage has decreased sharply in the industrial, residential and service sectors, etc., while oil-dependency is still considerable in the transport sector.

According to preliminary figures from Statistics Sweden, energy consumption rose by 0.4 percent to 405 TWh in 2004. Electricity usage was up by 0.7 percent, while use of oil products and district heating fell by 2.2 and 4.9 percent, respectively.

DIAGRAM 5

Total energy supply in Sweden 1973-2004
Source: Statistics Sweden

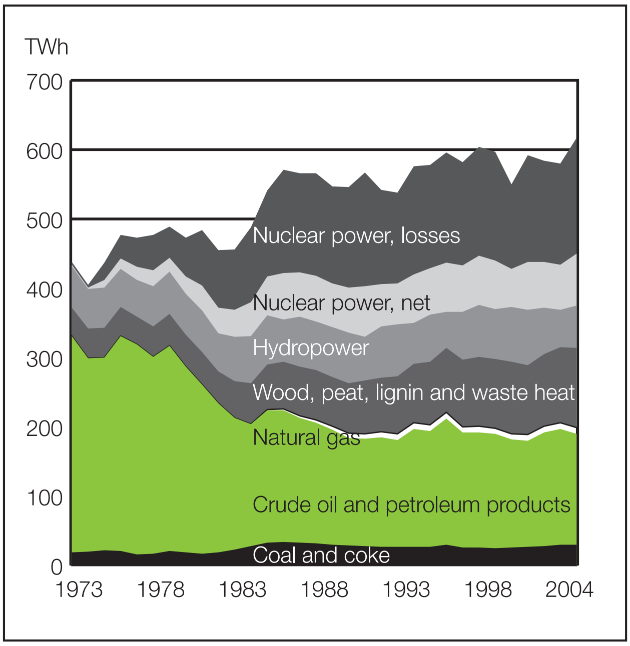
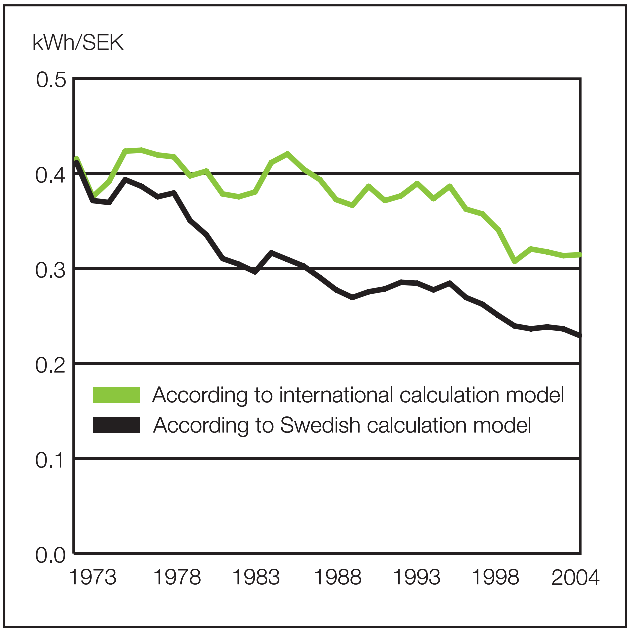


DIAGRAM 6

Total energy supplied in relation to GNP 1973-2004 (1995 prices)
Source: Statistics Sweden



[1)] Excluding net electricity imports, bunkering for international shipping and usage for non-energy purposes.

Electricity consumption

DIAGRAM 7

Electricity consumption as a function of GNP 1970-2004 (1995 prices)
Source: Statistics Sweden

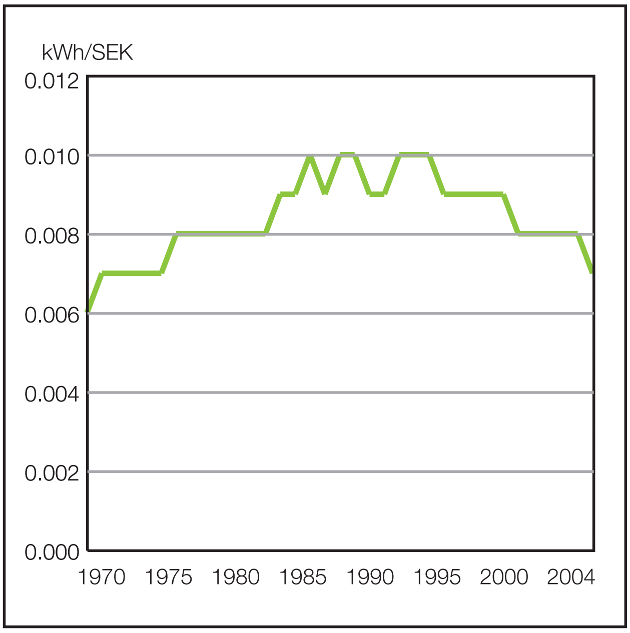
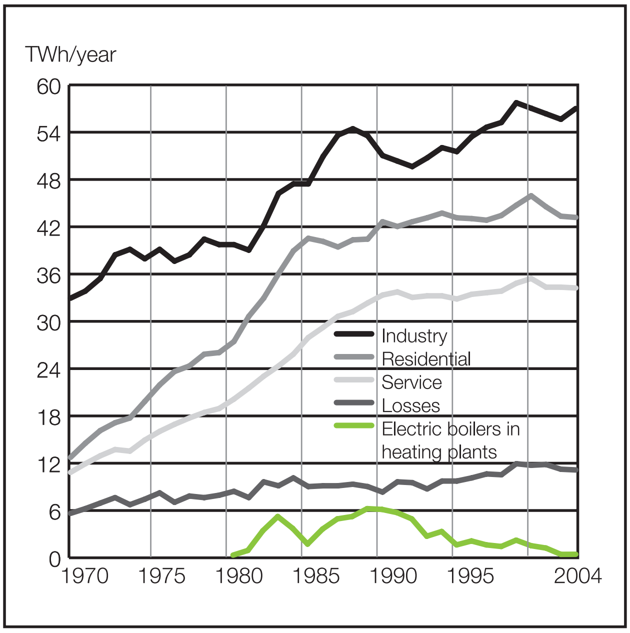


DIAGRAM 8

Breakdown of electricity consumption by sector 1970-2004
Source: Statistics Sweden



Total electricity consumption including transmission losses and large electric boilers in industries and heating plants rose from 145.3 TWh in 2003 to a preliminary 146.4 TWh in 2004.

Sweden has a relatively high proportion of electrical heating, more than 32 TWh in total, of which two thirds are dependent on the outdoor temperature. Temperature variations must therefore be taken into consideration when making year-on-year comparisons. Virtually the entire temperature adjustment is attributable to electricity consumption in homes and the service sector. Temperature-adjusted consumption in 2004 amounted to a preliminary 147.4 TWh, compared with 146.2 in 2003.

Electricity consumption trends are closely linked to economic growth. Diagram 7 shows development from 1970 onwards. Until 1986, the rise in electricity usage outpaced growth in GNP. During the years 1974-1986 this was largely attributable to increased use of electrical heating. Since 1993, however, electricity consumption has increased at a slower rate than GNP.

INDUSTRIAL ELECTRICITY CONSUMPTION

Diagram 8 shows that electricity usage in the industrial sector rose dramatically between 1982 and 1989 in conjunction with an extended economic boom. Devaluation of the Swedish krona in 1982 gave the electricity-intensive base industries, particularly pulp and paper, favourable conditions for growth. Consumption then declined during the economic recession and structural transformation of the early 1990s. At mid-year 1993 electricity utilization began rising again and continued upwards through the end of 2000. For the next three years industrial usage of electricity then declined somewhat – an effect of economic slowing and higher electricity prices. In 2004 this trend reversed and industrial electricity consumption rose by 3 percent.

Diagram 9 illustrates how the industrial sector's specific electricity usage, expressed in kWh per SEK of value added, has developed since 1970. Since 1993, industrial consumption in relation to value added has fallen sharply. This is due to the heterogeneous industrial structure in Sweden, where a handful of sectors account for a large share of electricity consumption, see Table 2. From 1993 onwards, the strongest growth in production of goods has been seen in the manufacturing and engineering industry, where value added output has more than doubled since then. Value added output in the energy-intensive industries has risen by only 25 percent, at the same time that its electricity consumption has climbed by 18 percent.

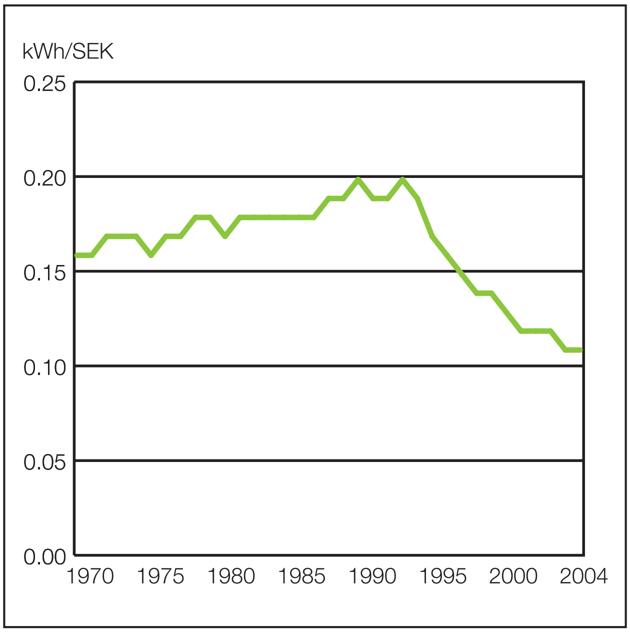
Table 2

INDUSTRIAL ELECTRICITY CONSUMPTION BY SECTOR 1999-2004, TWh
Source: Statistics Sweden

	2000	2001	2002	2003	2004 prel.
Mining	2.6	2.5	2.6	2.6	2.4
Food and beverages	3.0	2.8	2.7	2.5	2.3
Textiles and clothing	0.4	0.4	0.4	0.3	0.3
Wood products	2.3	2.2	2.3	2.2	2.1
Pulp and paper, graphics	24.1	23.2	23.4	23.2	23.0
Chemicals	7.6	7.7	7.7	8.0	8.1
Soil and stone products	1.2	1.4	1.2	1.1	1.1
Iron, steel and metalworking	8.2	7.9	7.8	7.5	8.1
Manufacturing and engineering	7.5	7.6	7.4	6.9	6.9
Small industries, craftsmen, etc.	1.0	1.2	1.0	0.9	2.8
TOTAL, incl. disconnectable electric boilers	57.8	57.1	56.4	55.3	57.0

DIAGRAM 9

Electricity consumption by industry in relation to value added (1991 prices)
Source: Statistics Sweden



ELECTRICITY USAGE IN THE SERVICE SECTOR, HEATING PLANTS, PUBLIC TRANSPORTATION, ETC.

Electricity consumption in the service sector (offices, schools, retail, hospitals, etc.) rose sharply during the 1980s, particularly with regard to lighting, ventilation, office equipment and electrical space heating.

This increase was generated by a considerable rise in standards for renovation, rebuilding and new construction of service industry premises, as well as a massive surge in the volume of computers and other equipment. The late 1980s saw a huge increase in the number of new buildings. However, few new construction projects were undertaken during the economic slump of the early 1990s, which together with more efficient appliances and equipment has caused electricity usage excluding large electric boilers to stabilize at 33-34 TWh per annum. The high electricity prices of recent years have contributed to a slight drop in consumption.

Most of the property sector's buildings use district heating. Electrical heating as the principal heat source is used in around 9 percent of the total building area, but accounts for around 20 percent of the total heating energy due to widespread use of electrical heating as a complement.

The service sector also includes technical services such as district heating plants, water utilities, street and road lighting and railways. These areas also

Table 3

NUMBER OF SUBSCRIBERS AND AVERAGE ANNUAL HOUSEHOLD CONSUMPTION IN 2003

Source: Statistics Sweden

	No. of subscribers	GWh	MWh/subscr.
Detached homes with consumption of > 10 MWh	1,065,231	21,198	19.9
Detached homes with max. consumption of 10 MWh	822,022	5,836	7.1
Apartment buildings, direct delivery with consumption of > 5 MWh	117,828	966	8.2
Apartment buildings, direct delivery with max. consumption of 5 MWh	1,988,416	4,573	2.3
Apartment buildings, aggregate deliveries	3,981	594	149.2
Holiday/summer homes	483,904	2,710	8.0
Total residential according to the above	4,481,382	35,878	8.0
Share of total number of subscribers	86.2%	26.4%	30.6%
Total number of subscribers	**5,197,689**	**136,033**	**26.2**

underwent powerful growth during the 1980s, when the district heating plants introduced large heat pumps that consumed over 2 TWh of electricity in 2000. Consumption in this sector reached only around 0.5 TWh in 2003 and 2004, with high electricity prices as one of the contributing factors.

RESIDENTIAL ELECTRICITY CONSUMPTION

The residential sector includes detached single-family homes, farms, apartment buildings and holiday/summer homes. Electricity for agricultural activities is attributed to the service sector. Electricity consumption, excluding electrical heating, has increased at an even pace since the 1960s, with the exception of the oil crisis in 1973-74 and a temporary conservation campaign in 1980-81 when the upward trend was temporarily curbed.

Consumption of household and operating electricity for apartment buildings has risen steadily, partly due to the growing number of homes and partly to a higher standard of electrical appliances and equipment. However, the rate of increase has slowed in recent years and is today essentially linked to the renovation of old apartment buildings and the fact that households are acquiring more appliances such as dishwashers, freezers, and home computers. In all housing types, the replacement of old equipment, such as refrigerators and washing machines, with modern and more energy-efficient models is offsetting the increase.

Electrical heating accounts for 30 percent of heating energy used in the residential sector, primarily in detached homes. A large number of detached homes with direct electrical heating were built during the period 1965-1980. After 1980 the majority of newly built detached homes have been equipped with electrical boilers for hot water systems. In order to reduce oil-dependency after the second oil crisis in the early 1980s, many detached homes converted from oil-fired to electric boilers during 1982-1986. In recent years the number of heat pumps has increased dramatically, thereby reducing the need to purchase energy for residential heating and hot water.

The preferred choice in new construction and conversion of apartment buildings has been district heating, where available. Outside the district heating networks, however, electrical heating has been installed, primarily in new construction. Electrical heating as a complement to other forms of heating is also widespread, and around 4 percent of the surface area in apartment buildings relies mainly on electrical heating.

Table 3 shows the number of subscribers and average consumption for various categories in the residential sector. The table excludes homes in the agriculture, forestry and similar sectors since it is not possible to distinguish residential usage from that for commercial activities.

Electricity production

DIAGRAM 10

Electricity production in Sweden by power type, TWh/year
Source: Swedenergy

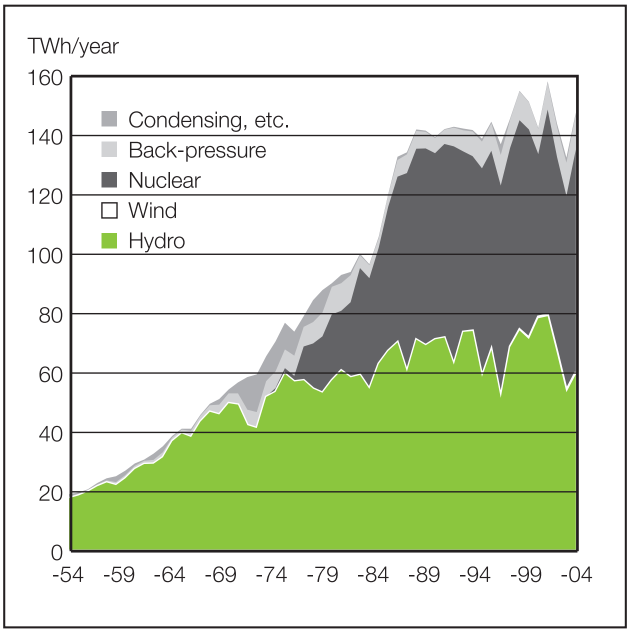
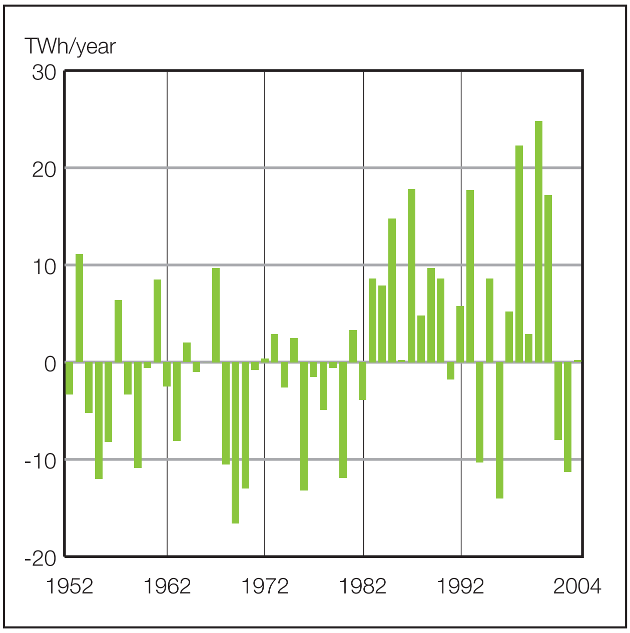


DIAGRAM 11

Runoff variations in relation to normal year runoff 1952-2004
Source: Swedenergy



Electricity production in Sweden is dominated by CO_2-free hydro and nuclear power. Although a large number of wind power plants have been built in recent years, their aggregate output is still marginal. Other types of thermal power, fired with fossil and biomass fuels, account for a combined 5-10 percent of total electricity output.

The Nordic electricity market and the exchange of electricity with neighbouring countries are of crucial importance for Sweden's electricity supply.

Sweden's aggregate domestic electricity output in 2004 amounted to 148.5 TWh, up by 12 percent compared with the previous year (132.5 TWh). The country's electricity production over the past 50 years is shown in Diagram 10.

WEATHER CONDITIONS

Weather conditions have a powerful influence on Sweden's power supply. Outdoor temperatures affect electricity consumption, particularly for heating of homes and other premises. The amount of precipitation, and subsequently also runoff to the reservoirs and hydropower stations, is critical for hydropower production and therefore also the entire Nordic electricity market.

Like the two preceding years, 2004 was unusually warm. Annual precipitation was 7 percent higher than normal.

RUNOFF AND RESERVOIR LEVELS

Total runoff in 2004 amounted to 66 TWh, close to the median value for the past fifty years and a slight recovery after two years of low runoff.

Diagram 11 shows that annual runoff can vary dramatically from year to year.

Runoff variations during the year are illustrated in Diagram 12. The grey field shows runoff with a probability rate of between 10-90 percent. There is a 10 percent probability that runoff will exceed the upper limit, and 90 percent probability that it will exceed the lower limit in the grey field. The black curve represents normal runoff (50 percent probability) and the green curve shows actual weekly runoff during 2004.

As seen in Diagram 12, runoff during the winter and up to the spring flood was fairly normal. The spring flood then arrived very early and was intensive. In a single week, more energy flowed into the reservoirs and hydropower plants than Barsebäck 2 produces in an entire year.

DIAGRAM 12

Runoff variations in the power-producing rivers
Source: Swedenergy

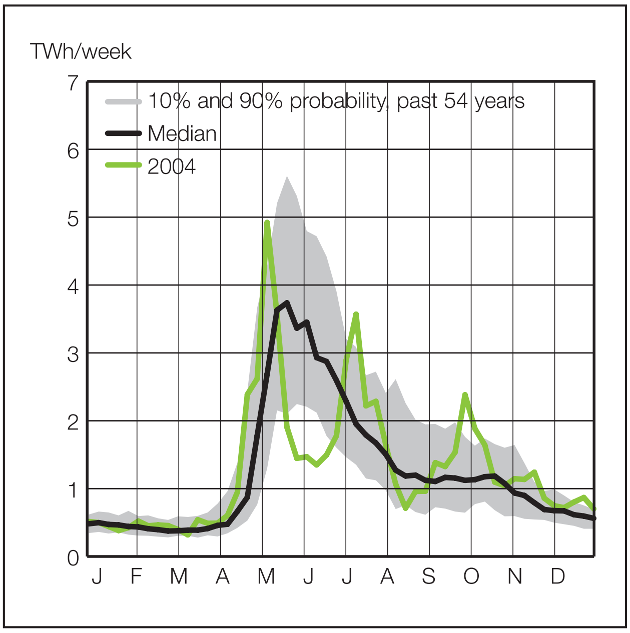
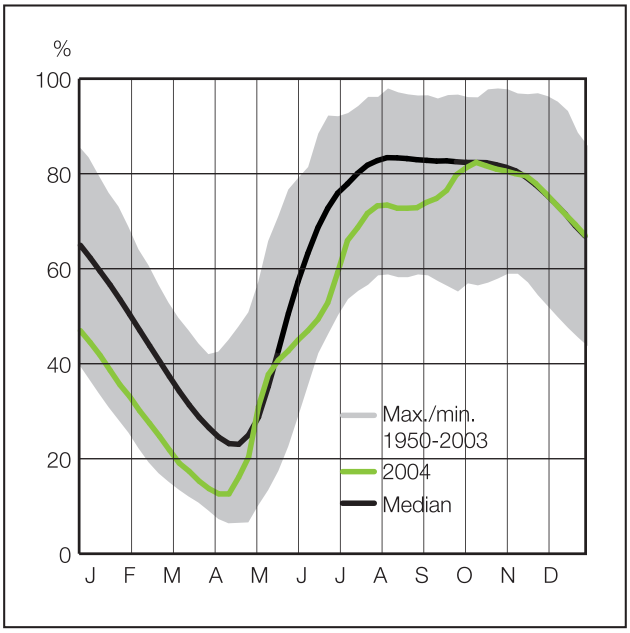


DIAGRAM 13

Storage levels in the regulating reservoirs
Source: Swedenergy



The country's aggregate reservoir storage is shown in Diagram 13. At the beginning of the year the storage level was 49 percent, which is 18 percentage points below average for the comparison period 1950-2003. Storage levels remained extremely sub-normal throughout the spring and bottomed out at 12 percent, a very low value although higher than the exceptionally low 8 percent recorded in 2003.

Because the spring flood does not start simultaneously throughout the country it is not possible for all reservoirs to be drawn down during the spring flood, since there are always some reservoirs in the process of being either filled or emptied at any given time. Although the spring flood came early and brought reservoir levels nearly up to average, the early summer's unusually low runoff caused storage levels to rise at a below-normal rate. Precipitation and runoff throughout the rest of the summer and autumn were higher than normal, after which the storage level rose gradually and reached a normal value in November. At year-end 2004 the storage level was 65 percent, which is close to average.

In conclusion, the water year 2004 can be characterized as fairly normal, although it started with severely drawn-down reservoirs that were later filled to normal levels with the help of abundant runoff in the second half of the year.

HYDROPOWER PRODUCTION

Sweden's hydropower production in 2004 amounted to 59.5 TWh, up by 12 percent over the previous year (52.9) and around 92 percent of normal year production. Hydropower accounted for 40 percent of Sweden's total electricity output in 2004.

The spread of hydropower production among the country's rivers is shown in Table 4. The four largest rivers – Luleälven, Umeälven, Ångermanälven including Faxälven, and Indalsälven – together represented 68 percent of total hydropower production.

Table 4

HYDROPOWER PRODUCTION

Breakdown by river in 2004, TWh

Source: Swedenergy

River	Net production
Lule älv	13.2 (11.3)
Skellefte älv	3.8 (3.0)
Ume älv	8.4 (6.0)
Ångermanälven	7.1 (6.5)
Faxälven	3.4 (3.3)
Indalsälven	8.3 (8.3)
Ljungan	1.4 (1.5)
Ljusnan	2.6 (3.1)
Dalälven	3.7 (4.0)
Klarälven	1.5 (1.5)
Göta älv	1.4 (1.1)
Other rivers	4.7 (3.3)
Total production	**59.5 (52.9)**

(2003 values in brackets).

The maximum quantity of water that can be stored, if the regulation reservoirs are used at full capacity, corresponded to an energy volume of 33.7 TWh at the end of 2004, on par with the preceding year. The energy production capacity in the country's hydropower stations during a normal year is 65 TWh, according to calculations based on runoff data for the years 1950-2000.

The installed power capacity in Sweden's hydropower stations at the end of 2004 was around 16,100 MW. No significant rebuilding or new construction took place during the year.

WIND POWER

The contribution of wind power to electricity production in 2004 was around 850 GWh, an increase of around 35 percent over the preceding year and equal to approximately 0.6 percent of the country's annual electricity output.

Seventy new wind power plants went into operation during the year and at the end of 2004 Sweden had some 700 wind power plants with an output of more than 50 kW each. The installed capacity increased by around 40 MW during 2004 and at year-end the total installed wind power capacity was approximately 442 MW.

NUCLEAR POWER

Nuclear power production in Sweden during 2004 amounted to 75.0 TWh (65.5 TWh in 2003). Table 5 shows the nuclear power plants' energy availability and output for the years 2001-2004 and total output per reactor from the year of commissioning.

In 2004 the Oskarshamn plant produced a net volume of 17.4 TWh (13.9), representing around 12 percent of the country's total electricity production.

Aside from the four reactors at Ringhals, the Ringhals group also includes Barsebäck 2. These plants produced a net volume of 32.7 TWh (27.8), equal to 22 percent of the country's total electricity output and an increase over the previous annual record of 11 percent.

2004 was a record year for the Ringhals group, when the net production output in four of the five reactors reached an all-time high. Average energy availability (power generation capability) exceeded 91 percent, with Ringhals 3 leading at a world-class 94 percent. R3 was also the first Ringhals reactor to produce more than 7 TWh in a single year. In spite of the decommissioning decision last autumn, Barsebäck 2 achieved its best net output since starting up in the mid-1970s.

Thanks to record-high energy availability Forsmark was able to produce an unprecedented 25 TWh (23.8) in 2004, and at the same time achieved the highest energy availability factor in the company's history. The net output corresponded to 18 percent of Sweden's total electricity production.

Table 5

NUCLEAR POWER PLANT ENERGY AVAILABILITY AND PRODUCTION

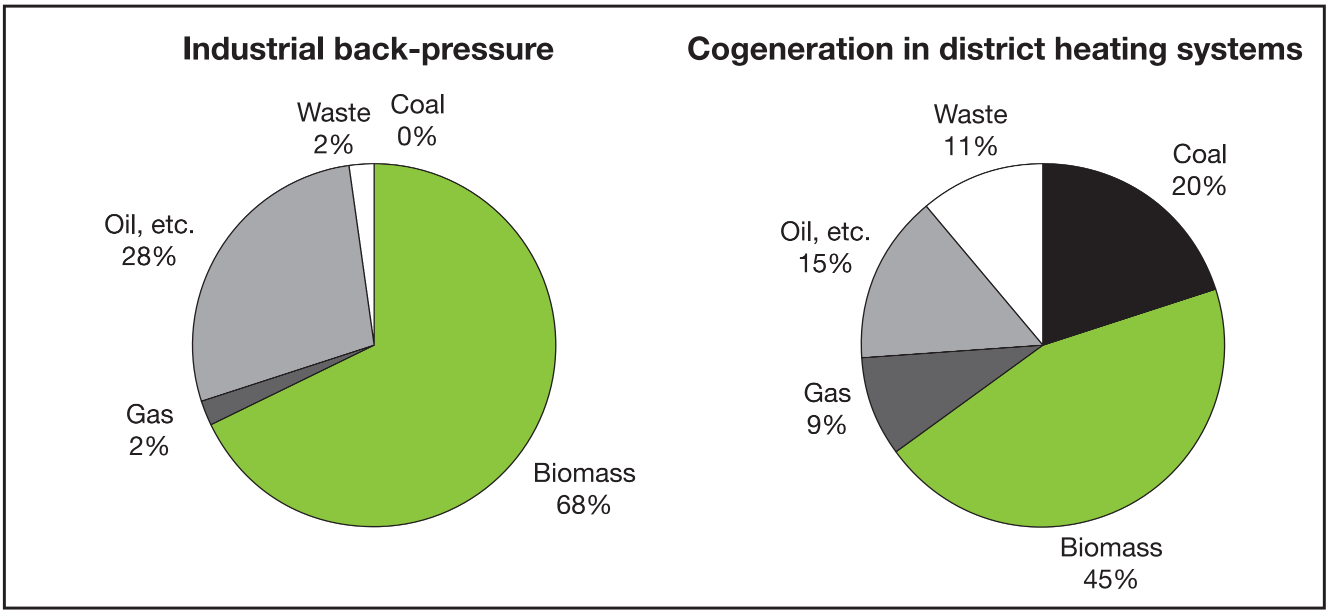
Source: OKG, Ringhalsgruppen, Forsmarks Kraftgrupp

	Net capacity		Energy availability				Production volume				Total output from start-up date
			2001	2002	2003	2004	2001	2002	2003	2004	
Reactor	MW	Start-up	%	%	%	%	TWh	TWh	TWh	TWh	TWh
Barsebäck 1	(600)	1975									92.7
Barsebäck 2	600	1977	88.4	77.2	45.4	91.1	4.4	3.9	2.2	4.6	105.7
Forsmark 1	961	1980	94.8	91.3	92.1	97.5	7.3	7.1	7.4	8.0	162.2
Forsmark 2	959	1981	92.3	90.1	89.2	97.0	7.4	6.8	7.3	8.0	157.4
Forsmark 3	1,185	1985	86.2	95.1	96.9	89.4	8.2	9.1	9.1	9.0	164.3
Oskarshamn 1	467	1972	83.7		75.7	87.6	3.1	0.0	3.1	3.5	78.6
Oskarshamn 2	602	1974	92.3	91.0	59.4	89.1	4.7	4.5	3.1	4.6	117.8
Oskarshamn 3	1,155	1985	92.6	92.0	77.9	93.0	9.1	8.9	7.7	9.3	161.1
Ringhals 1	835	1976	86.1	86.9	70.5	90.1	5.8	6.0	5.1	6.5	134.9
Ringhals 2	872	1975	87.0	92.3	92.4	90.4	6.3	6.5	6.8	6.8	148.1
Ringhals 3	920	1981	88.5	90.3	85.3	93.9	6.3	6.9	6.7	7.5	139.4
Ringhals 4	915	1983	88.2	80.2	89.1	92.0	6.6	5.9	7.0	7.2	134.2
	9,471		89.1	89.2	82.0	92.3	69.2	65.6	65.5	75.0	1,596.5

DIAGRAM 14

Electricity output per fuel type in industrial back-pressure and cogeneration in district heating systems

Source: Swedenergy



The foundation for Forsmark's impressive results was laid during the summer's annual maintenance inspection. Extensive maintenance at Forsmark 3 that included the replacement of low pressure turbines proceeded smoothly and annual maintenance at Forsmark 1 and Forsmark 2 was completed in record time.

Energy availability at Forsmark – i.e. the ratio of the energy that the available electric capacity produced during this period relative to the energy that the maximum capacity could have produced during the same period – was 94.3 percent in 2004 (93.0 percent in 2003).

Forsmark is expected to exceed this record result in the next few years, partly thanks to replacement of low pressure turbines at Forsmark 1 and 2 in 2005 and 2006 and planned capacity increases in all three reactors during 2008-2010.

Average energy availability during the year for the eleven Swedish reactors was 92.3 percent, compared with a global average of 75 percent for nuclear power plants of similar types.

The country's installed nuclear power capacity was 9,441 MW at the beginning of 2004 and 9,471 MW at the end of the year. Net output from Forsmark 3 has increased from 1,155 MW to 1,185 through the installation of a new and more efficient turbine.

ELECTRICITY PRODUCTION BASED ON FOSSIL AND BIOMASS FUELS

Fossil fuels include oil, coal and natural gas. Peat is normally also regarded as a fossil fuel, but is classified separately in Sweden. Biomass fuels include wood waste, energy forest, one-year crops, agricultural waste, and recycled lignin from the cellulose industry.

Combustion of biomass fuels offers environmental advantages in that the amount of carbon dioxide stored in trees and other plants as they grow is equal to the amount they release when burned. Provided that this balance is maintained, biomass fuels make a zero contribution to the greenhouse effect.

In 2004 electricity generated from other thermal power (fossil and biomass fuels) amounted to 13.1 TWh (13.5), representing close to 9 percent of Sweden's total electricity output. Of this, 5.5 TWh (5.2) was produced in industrial CHP (back-pressure) plants and 6.8 TWh (6.5) in cogeneration plants in district heating systems. Diagram 14 shows the fuel types used for industrial back-pressure stations and cogeneration plants in district heating systems.

The condensing power plants and gas turbines (both of which generate only electricity) produced 0.8 TWh (1.8).

The installed capacity in fossil and biomass fuel-fired power plants (other thermal power) does not include diesel back-up generators in hospitals, hydropower plants, etc.

No major power plants were taken into operation during the year. The Marviken CHP plant (200 MW, oil condensing) was prepared for recommissioning after having been mothballed for many years. With effect from the winter of 2004/05, Marviken is part of the Svenska Kraftnät's power reserve. Otherwise, a number of gas turbines were sold abroad or scrapped.

DIAGRAM 15

Ownership of electricity production

Source: Swedenergy

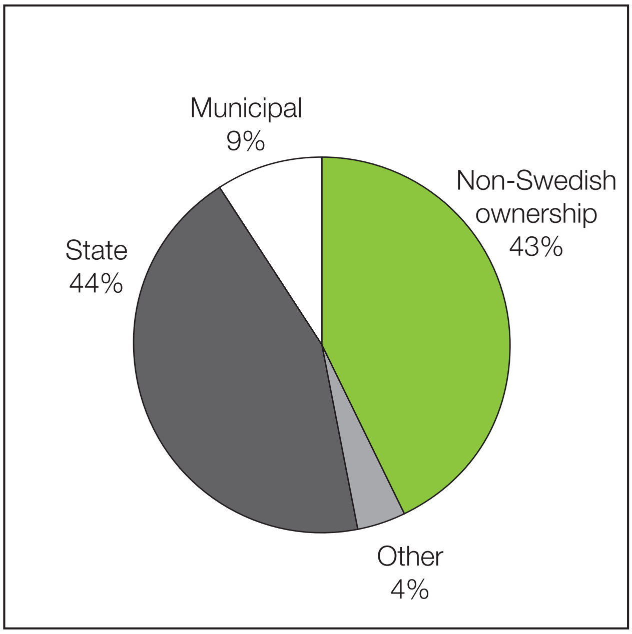
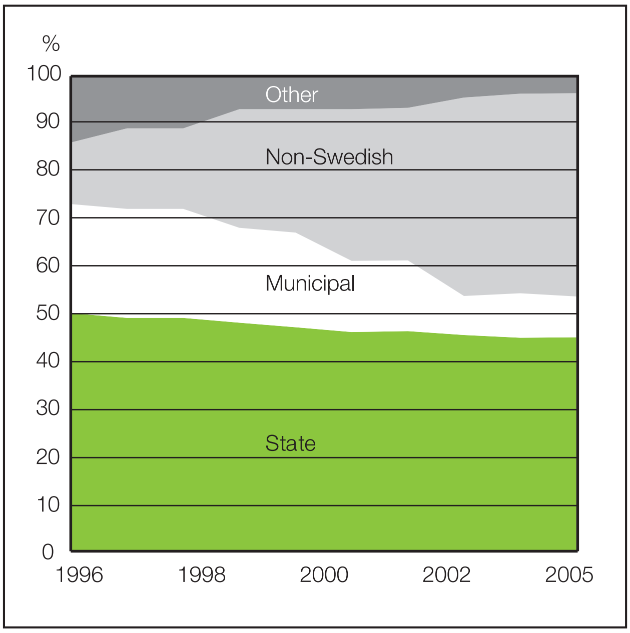


DIAGRAM 16

Changes in ownership of electricity production 1996-2005

Source: Swedenergy



INSTALLED CAPACITY

The aggregate installed capacity in the country's power stations at the end of the year was 33,551 MW, divided between the various power types listed in Table 6. The total installed capacity consists of 48 percent hydropower, 1 percent wind power, 28 percent nuclear power and 23 percent other thermal power.

Due to hydrological limitations, etc., it is not possible to utilize the entire installed capacity at the same time. During certain parts of the year, there are also constraints in physical grid transmission from northern to central and southern Sweden. Furthermore, some capacity must be reserved to regulate voltage in the power grid and deal with disturbances.

In order to continuously secure the power supply and avoid power shortages, reserve power at least equivalent to the output of one of the country's largest power plants must always be available. International connections enable neighbouring countries to quickly assist each other in the event of disturbances.

Table 7 shows how the installed capacity in the country's power stations is divided between the member companies in Swedenergy and other companies.

Table 6

INSTALLED CAPACITY IN SWEDISH POWER STATIONS, MW

Source: Swedenergy

	31 Dec. 2003	31 Dec. 2004
Hydropower	16,143	16,137
Wind power	399	442
Nuclear power	9,441	9,471
Other thermal power	7,378	7,501
- CHP, industry	979	980
- CHP, district heating	2,572	2,600
- Condensing	2,108	2,298
- Gas turbines, etc.	1,719	1,623
Total	33,361	33,551
Added	+1,140	+323
Removed	-42	-133

ELECTRICITY PRODUCERS

In total, the Swedish state owns approximately 44 percent of the power production capacity, non-Swedish owners around 43 percent, municipalities around 9 percent and others roughly 4 percent, see Diagram 15. Diagram 16 shows how foreign ownership, in particular, has increased in recent years.

Acquisitions and mergers have progressively reduced the number of major electricity producers over the past 20 years, and this structural rationalization has led to a strong concentration of power production. The four largest electricity producers generated around 131 TWh or 88 percent of Sweden's total electrical output in 2004. In the production figures shown in Table 8, minority shares have been omitted and leased electricity production is included only for the company utilizing this production.

Table 7

MEMBER COMPANY POWER ASSETS IN SWEDEN (MW) ON 1 JANUARY 2005

Source: Swedenergy

Company	Hydropower	Nuclear power	Wind power	Other thermal power	Total
Vattenfall AB	7,960	5,119	26	1,262	14,367
Sydkraft AB	3,030	2,590	17	1,735	7,372
Fortum Power and Heat AB	3,130	1,653	0	1,446	6,229
Skellefteå Kraft AB	674	62	0	59	795
Jämtkraft AB	210	0	1	45	256
Holmen Kraft AB	247	0	0	0	247
Tekniska Verken i Linköping AB	91	0	0	150	241
Mälarenergi AB	43	0	0	170	213
Umeå Energi AB	153	0	0	15	168
Öresundskraft AB	3	0	0	127	130
Karlstads Energi AB	24	47	0	34	105
LuleKraft AB	0	0	0	90	90
Växjö Energi AB	0	0	0	60	60
Göteborg Energi AB	0	0	4	50	54
Sundsvall Energi Elnät AB	0	0	0	54	54
Sollefteåforsens AB	49	0	0	0	49
Borås Energi Nät AB	12	0	0	34	46
Eskilstuna Energi & Miljö AB	2	0	0	39	41
Jönköping Energi Nät AB	20	0	0	9	29
Ängelholms Energi AB	0	0	0	29	29
Lunds Energikoncernen AB (publ)	0	0	1	25	26
Other member companies	128	0	15	93	236
TOTAL	15,776	9,471	64	5,526	30,837
NON-MEMBER COMPANIES					
Svenska Kraftnät	0	0	0	640	640
Others	361	0	378	1,335	2,074
Total in Sweden	16,137	9,471	442	7,501	33,551

Table 8

LARGEST ELECTRICITY PRODUCERS

Output in 2004, TWh

Source: Swedenergy

	Nordic region		Sweden	
Vattenfall	70.5	(61.5)	70.0	(61.5)
Fortum	50.7	(49.9)	24.0	(24.7)
Sydkraft	34.0	(29.5)	33.9	(29.5)
Skellefteå Kraft	3.5	(2.8)	3.1	(2.4)
Total	**158.7**	(143.7)	**131.0**	(118.1)

(2003 values in brackets).

DIAGRAM 17

Electricity production and consumption in Sweden 2002-2004, TWh/week

Source: Swedenergy

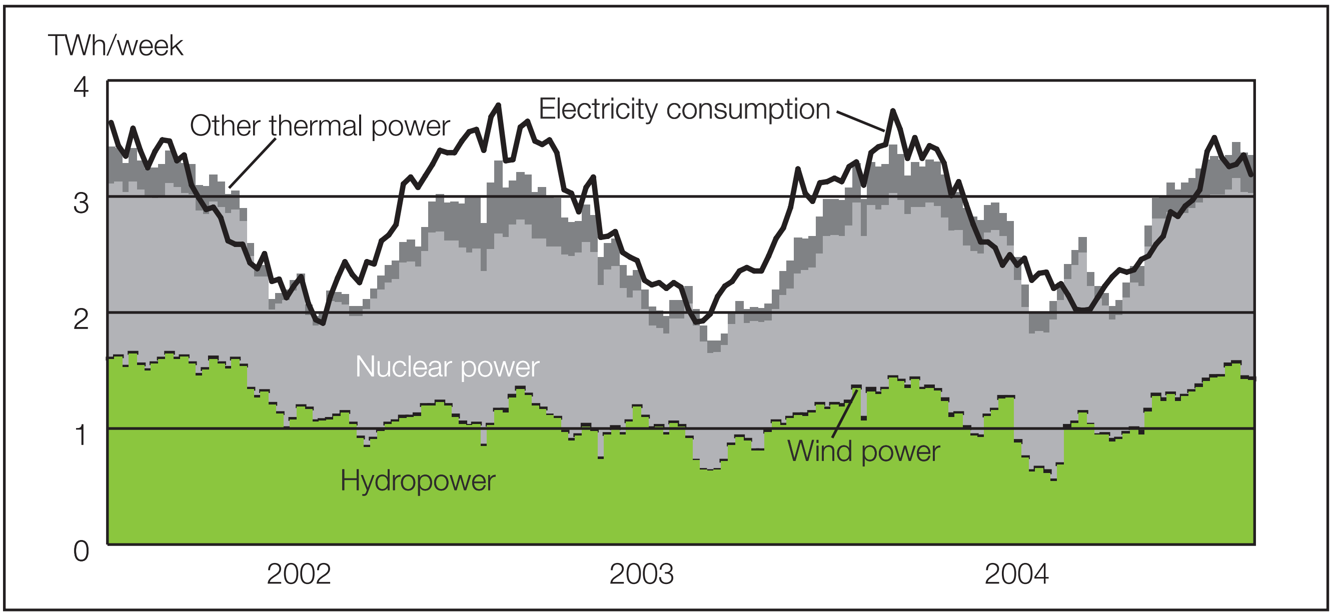
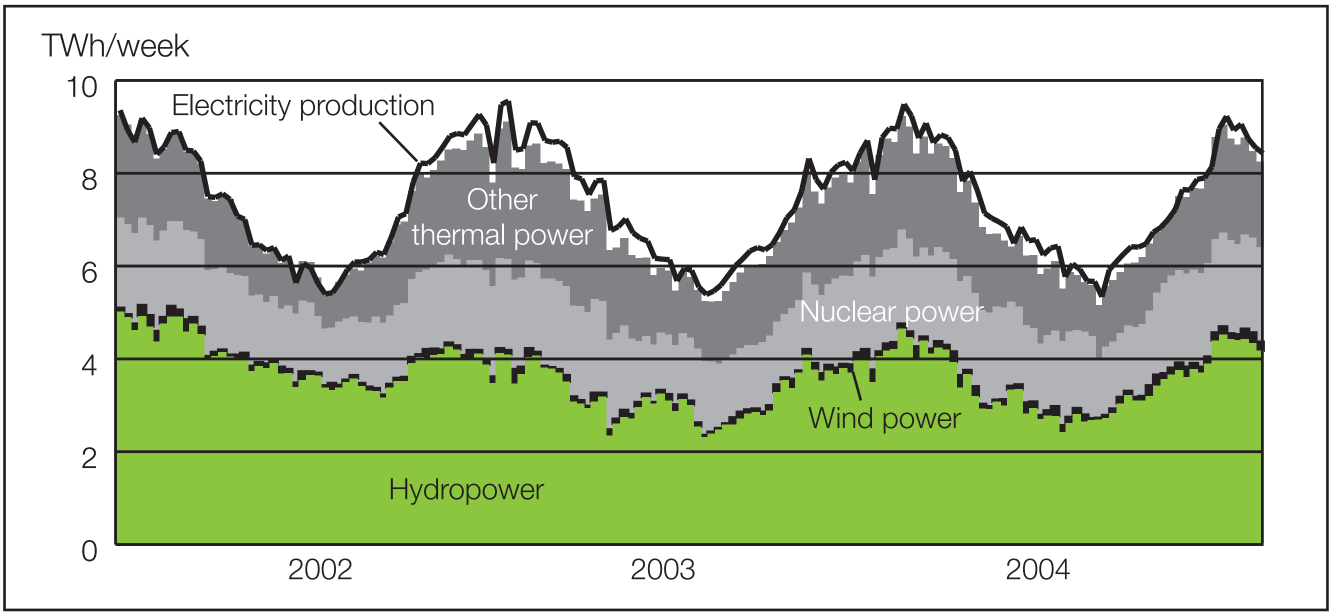


DIAGRAM 18

Electricity production and consumption in the Nordic countries 2002-2004, TWh/week

Source: Nord Pool



THE POWER BALANCE

The weekly power balance for Sweden and the Nordic countries over the period 2002-2004 is illustrated in Diagrams 17 and 18. Production is divided between hydropower, wind power, nuclear power, and other thermal power. Development since 2000 is illustrated in Table 9.

Diagram 17 shows the spread of electricity production over the past three years to cover the domestic power requirement and variations in Sweden's net electricity exchange with neighbouring countries during the year. The difference between electricity consumption and total electricity production represents the net inflow of electricity to Sweden (if consumption exceeds total production) or the net outflow of electricity from Sweden (if total production exceeds consumption).

Hydropower is utilized relatively evenly over the year in that the reservoirs are filled during the spring

TABLE 9

ELECTRICAL ENERGY BALANCE 2000-2004, TWh
Source: Statistics Sweden

	2000	2001	2002	2003	2004*
Domestic production	141.9	157.7	143.2	132.5	148.5
Hydropower	77.9	78.4	66.1	52.9	59.5
Wind power	0.5	0.5	0.6	0.6	0.9
Nuclear power	54.8	69.2	65.6	65.5	75.0
Other thermal power	8.8	9.5	11.0	13.6	13.1
CHP, industry	4.2	3.9	4.2	5.2	5.5
CHP, district heating	4.4	5.1	5.7	6.5	6.8
Condensing power	0.3	0.5	1.0	1.8	0.8
Gas turbine, diesel, etc.	0.03	0.02	0.03	0.1	0.1
Pump power	-0.01	-0.01	-0.04	-0.06	-0.06
Domestic consumption	146.6	150.3	148.6	145.3	146.4
Transmission losses	11.1	11.8	11.9	10.7	11.1
Electricity from neighbouring countries	18.3	11.2	20.1	24.3	15.6
Electricity to neighbouring countries (-)	-13.6	-18.5	-14.8	-11.5	-17.7
Net exchange with neighbouring countries	4.7	-7.3	5.4	12.8	-2.1

* Preliminary data from Swedenergy

and summer and the energy stored in the reservoirs is used throughout the winter until the next year's spring flood. Maintenance shutdowns at the nuclear power plants are carried out during the summer, when electricity usage is low. Other thermal power consists almost entirely of CHP plants with the bulk of production during the winter when the district heating requirement is high.

Diagram 18 shows how electricity production is spread over the year in order to cover the power requirement in the Nordic market. The most significant differences in the production mix compared with Sweden are a larger share of other thermal power and a proportionately high share of wind power in the Nordic region.

In 2004 the record high net inflow of electricity to Sweden reversed to a net outflow, see Table 9. The exchange of power is described in more detail later in this report. In total during the year, hydropower accounted for 40 percent of the country's electricity production, wind power for 0.5 percent, nuclear power for 50 percent and other thermal power for 9 percent.

The highest electricity usage per hour during 2004 was recorded between 8-9 a.m. on 22 January and reached approximately 27,300 MWh/h, compared with the previous year's peak value of 26,400 MWh/h.

DIAGRAM 19

Hourly load profile for electricity consumption with peak demand in 2004 and typical 24-hour period in winter and summer
Source: Svenska Kraftnät and Swedenergy

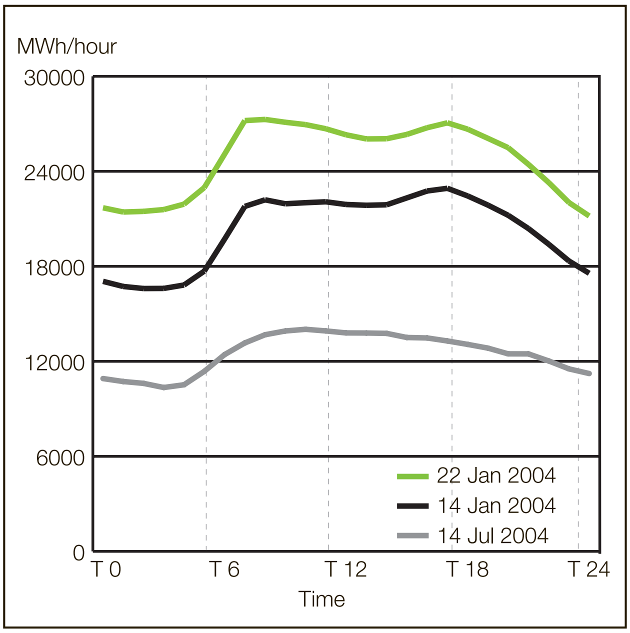
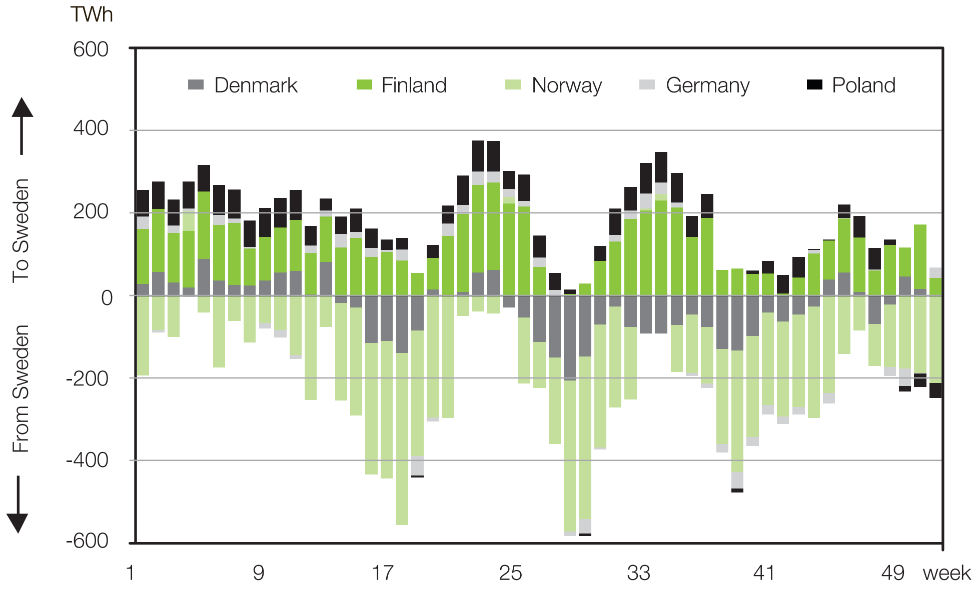


DIAGRAM 20

Net flow of electricity to and from Sweden in 2004 per neighbouring country

Source: Svenska Kraftnät



The weighted average daily temperature in Sweden on 22 January was -13.3 ºC, which is 8.7 ºC colder than normal. The daily electricity consumption profile for 22 January is shown in Diagram 19 where two typical 24-hour periods are presented for the sake of comparison, one winter and one summer.

Electricity consumption on weekdays generally has two peaks, one at 8 a.m. and one at 5 p.m. Due to the strong influence of temperature on electricity usage in Sweden, the amount of electrical energy consumed on a winter weekday is twice that consumed on a Saturday or Sunday during the summer.

The rise in electricity consumption during a warm summer due to increased use of fans and air conditioning, irrigation, etc., is still insignificant compared with the effects of a winter month in the form of increased electricity usage for heating.

ELECTRICITY EXCHANGE

Following deregulation of the Swedish electricity market in 1996, the country's exchange of electricity with neighbouring countries is accounted for in terms of physical (measured) values by country, with the sum of net exchanges specified by the hour and point of exchange. Svenska Kraftnät is responsible for this reporting.

In 2004 Sweden's inflow of electricity from neighbouring countries amounted to 15.6 TWh, a decrease of around 21 percent compared with the previous year. The outflow of electricity from Sweden rose to 17.7 TWh, resulting in a net export of 2.1 TWh. In the previous year, Sweden recorded a net import of 12.8 TWh (Table 10). The year's net export was due to an improved water situation, but above all to record high nuclear power production. The electricity flow data for 2004 shows that Sweden had a varying in- and outflow during the year, see Diagram 20.

Table 10

ANNUAL VALUES FOR SWEDEN'S EXCHANGE WITH NEIGHBOURING COUNTRIES IN 2004

Source: Svenska Kraftnät

TWh	To Sweden		From Sweden	
Denmark	2.5	(7.4)	4.0	(1.4)
Finland	7.2	(7.3)	1.0	(0.9)
Norway	2.3	(4.8)	11.3	(8.6)
Poland	1.4	(2.2)	1.3	(0.6)
Germany	2.4	(2.6)	0.2	(0.0)
Total	**15.6**	(24.3)	**17.7**	(11.5)

(2003 values in brackets).

Environmental issues in the power industry

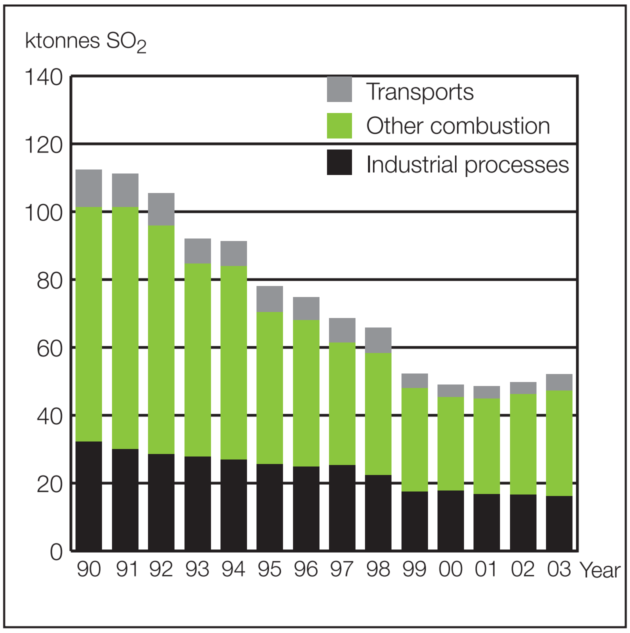
All extraction, conversion and consumption of energy have some effect on the environment. Burning of fuels gives rise to emissions of substances such as sulphur dioxide and nitrogen oxides. However, even non-combustion based power generation, such as hydro and wind power, has an impact on the local environment. For example, construction of wind farms along the coast alters the visual landscape and hydropower plants affect biodiversity through changed and irregular water flows, with consequences for the migratory paths of fish and habitats of shoreline flora.

Environmental consideration has always been a natural part of the power industry's responsibilities, but is now carried out in a more structured manner than before. Most companies in the industry are certified according to the environmental management standard ISO 14001, which ensures that environmental issues are addressed systematically towards the goal of continuously reducing negative environmental effects. Electricity production in Sweden has a generally low environmental impact in the form of emissions, since over 90 percent is based on hydro and nuclear power which generate no combustion-related emissions at all.

DIAGRAM 21

Swedish emissions of sulphur dioxide 1990-2003

Source: Swedish Environmental Objectivies Council



ACIDIFICATION AND SULPHUR DIOXIDE

Acidification is counted among the more regional environmental problems, and sulphur fallout is the primary cause of acidification in Swedish soil and waterways. Since Scandinavian soils are particularly sensitive to acidification, this problem attracted attention at an early stage in Sweden. Sulphur dioxide is a transboundary airborne pollutant and approximately 90 percent of fallout in Sweden originates from central Europe and the UK.

Sulphur dioxide emissions in Sweden (Diagram 21) have fallen sharply from a high of 925,000 tonnes in 1970 to 52,000 tonnes in 2003, which is lower than the environmental target of 60,000 tonnes set for the year 2010. The cold winter of 2003 meant that emissions were somewhat higher than in 2002. Of total sulphur dioxide emissions, around 70 percent is attributable to combustion of oil and coal. Many power and heat generation facilities have installed desulphurisation plants or now use low-sulphur oil. Around 4 percent of sulphur dioxide emissions in Sweden come from electricity production.

The data in the above diagram does not include emissions from fuel sold in Sweden for use in international shipping and aviation. The contributions from such usage in 2003 amounted to 73,000 and 500 tonnes, respectively. The previously underestimated sulphur emissions from maritime shipping have more than doubled since 1990 and now exceed the combined total of all land-based emissions. The reason for the large emission volumes from international shipping is that the industry is still free to use heavy, high-sulphur oils for fuel.

NUTRIFICATION AND NITROGEN OXIDES

The primary effect of nitrogen oxide fallout into the soil is to promote the growth of nitrogen-loving plants at the expense of indigenous flora such as blueberries and lingonberries. So far, nitrogen oxide fallout in Sweden has caused only minor leaching into the country's waterways. Nitrogen oxides are transboundary airborne pollutants and only around 17 percent of fallout is of domestic origin.

Nitrogen oxide emissions also lead to the production of ground-level ozone. In Sweden, this type of ozone causes both health problems and damage to trees and crops costing billions per year. Like emis-

DIAGRAM 22

Swedish nitrogen oxide emissions 1990-2003

Source: Swedish Environmental Objectives Council

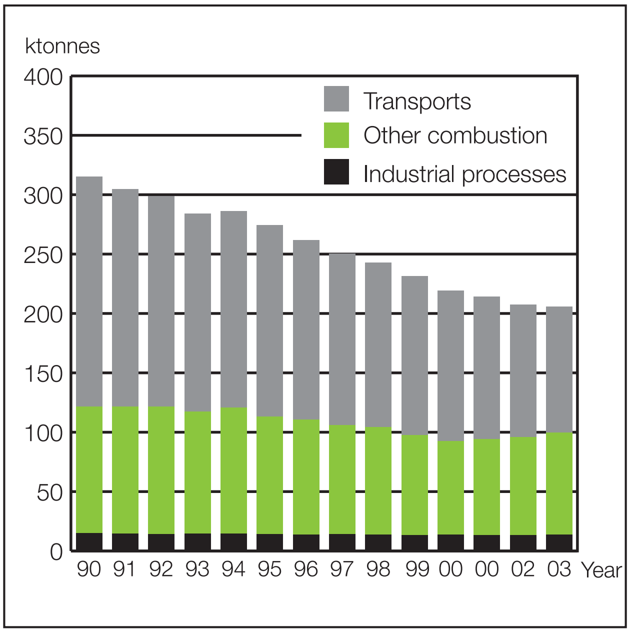
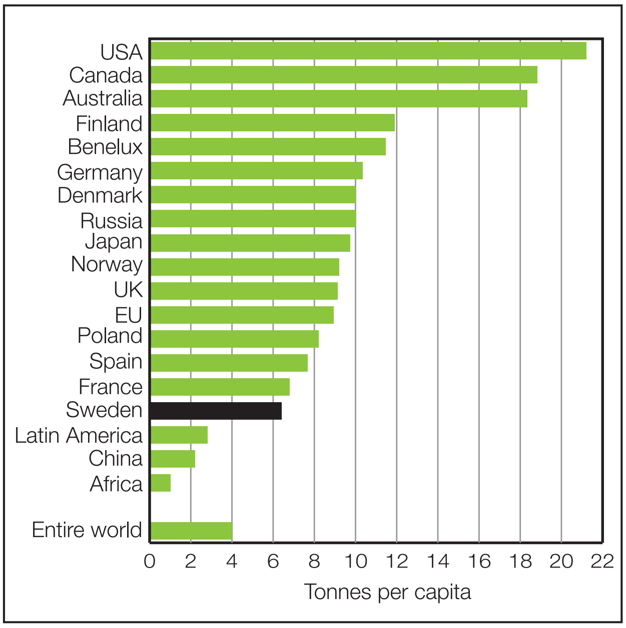


DIAGRAM 23

Other countries' emissions of CO_2 equivalents, tonnes per capita

Source: Swedish Environmental Protection Agency



sions, Sweden's ozone levels are largely of foreign origin.

Nitrogen dioxide emissions in Sweden (Diagram 22) have declined in recent years, but have proven more difficult to reduce than sulphur dioxide emissions. In 2003 Sweden's total nitrogen oxide emissions amounted to 206,000 tonnes and the target for 2010 is a reduction to 148,000 tonnes. Of total emissions in 2003 the bulk is attributable to traffic, primarily passenger cars and trucks, but also machinery, equipment and seagoing vessels. The majority of power and heat generating facilities have installed denitrification scrubbers and today only around 1 percent of emissions come from electricity production.

CLIMATE CHANGE AND GREENHOUSE GASES

Over the past 150 years, atmospheric levels of anthropogenic carbon dioxide have increased by around 30 percent. Measurements show that the average global temperature has risen by approximately 0.6 °C during the 1900s and that the rate of increase has accelerated in the last 25 years.

While carbon dioxide is the main greenhouse gas there are a number of other gases that also contribute to the greenhouse effect, primarily methane and dinitrogen oxide. Today Sweden has low emissions of greenhouse gases (GHGs), around 72.2 Mtonnes of CO_2 equivalents, while CO_2 emissions at the beginning of the 1970s exceeded 100 Mtonnes per year. The difference is due to a drastic reduction in the use of oil in favour of electricity generated from nuclear power. At just over 6 tonnes per year, Sweden's per capita emissions of CO_2 equivalents are low in comparison with other industrialized nations (Diagram 23). The EU average is around 9 tonnes per capita and year. Sweden's long-term goal for 2050 is to reach a level of less than 4.5 tonnes per capita and year.

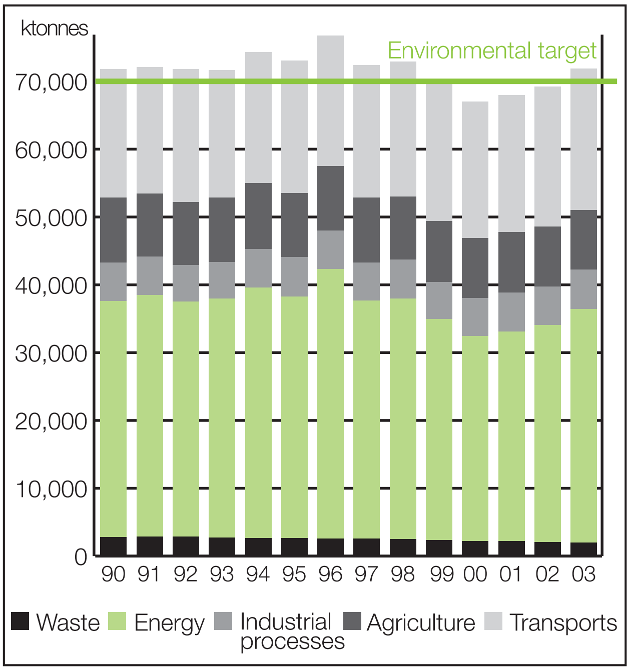
Nonetheless, it is important to be aware that climate change is a global concern and must be addressed at the global level. Because Swedish emissions of CO_2 equivalents make up only 0.5 percent of annual global emissions, unilateral measures in Sweden have no tangible effect on climate change. The United Nations Framework Convention on Climate Change was signed in 1992 and later led to the Kyoto Protocol in 1997. The Kyoto Protocol's commitment period runs from 2008-2012 and, following ratification by Russia, went into effect on 16 February 2005. The Protocol requires the industrialized nations to reduce their emissions by at least 5 percent below the 1990 levels.

Negotiations have already been initiated for the period after 2012 and although most parties accept that the Kyoto Protocol is merely a first step, there are differences of opinion about how to move forward. One critical factor for future agreements is how industrialized nations like the USA and Australia and developing economies like China, India and Brazil, all large producers of emissions, can be persuaded to join and the conditions for their participation.

DIAGRAM 24

Swedish emissions of greenhouse gases 1990-2003

Source: Swedish Environmental Objectives Council



Within the framework of the Kyoto Protocol, Sweden has been granted the possibility of increasing its CO_2 emissions by 4 percent over the 1990 level up to the period 2008-2012. Despite this, the Swedish climate target is to reduce average emissions of GHGs between 2008 and 2012 by at least 4 percent relative to the year 1990. According to current statistics, Sweden's CO_2 emissions fell by 3.5 percent between 1990 and 2002, largely thanks to a 38 percent decrease in emissions from small-scale heating plants during the period. Among other things, this has taken place through the extension of district heating systems in densely populated areas and the installation of heat pumps in more sparsely populated regions. However, emissions rose in 2003 and were on par with the reference year 1990, mainly due to a cold winter and below-normal access to hydropower.

In its "Checkpoint for Climate Policy" report from 2004, the Swedish Energy Agency and the Swedish Environmental Protection Agency forecasted that CO_2 emissions through the year 2010 will decrease by roughly -1.3 percent compared with 1990, and will thereafter increase by around 5.7 percent to the year 2020. How the phaseout of nuclear power is handled will be decisive for the development of Swedish greenhouse emissions, and a nuclear power plant life of 40 years is assumed in the baseline scenario. A shorter plant life of 32 years results in an increase of 15 percent, while an extended life of 60 years produces a much lower increase (+0.9 percent) to the year 2020.

Electricity production in a normal year accounts for around 2 million tonnes, or just over 3 percent, of total Swedish CO_2 emissions. In a dry year, emissions increase to around 3 million tonnes (5 percent).

Diagram 24, which shows emissions of greenhouse gases, also includes other GHGs expressed as carbon dioxide equivalents. Emissions from the electricity sector are not shown separately.

EMISSIONS TRADING

The EU scheme for trading of emission rights was launched on 1 January 2005. Emissions trading is one of the so-called flexible mechanisms defined in the Kyoto Protocol. The goal of this trading is to enable companies and states to choose between carrying out their own emission-reducing measures or buying emission rights which then generate emission reductions somewhere else. The idea is for the least expensive measures to be taken first, thus keeping the total cost of meeting Kyoto targets as low as possible. The carbon dioxide tax in Sweden has already led to the implementation of many less expensive measures and now only costlier options remain. In other countries there are less expensive emissions abatement actions still to be taken.

The scheme will begin with a trial period between 2005 and 2007. The next phase, concurrent with the Kyoto Protocol's commitment period, runs from 2008 to 2012. Discussions are under way to formulate operating rules for the upcoming period, where one key issue is how to allocate emission rights between the scheme participants. The current models for allocation of emissions allowances differ significantly between countries, particularly in the energy sector, and there is widespread agreement on the need for harmonization.

Over 700 facilities in Sweden are covered by the scheme. In the energy industry, the system includes all individual facilities with a capacity of more than 20 MW or district heating systems with a combined capacity exceeding 20 MW.

ENVIRONMENTAL ASPECTS OF HYDROPOWER

Hydropower accounts for nearly half of Sweden's electricity production, and also serves the vital function of regulating voltage variations in the power system. As the share of non-regulatable electricity production from other renewable energy sources such as wind power rises, the role of hydropower as a regulator is becoming even more important.

Many hydropower plants were built in the first half of the 1900s when environmental considerations were dealt with differently than today. Over time the environmental focus has intensified and for many years the hydropower sector has taken an active approach to environmental issues, for example through eco-adaptation of existing facilities and research activities in this field. The establishment of national environmental objectives, the EU's water framework directive and activities related to biodiversity are highlighting the need for ongoing attention to environmental issues in existing and new hydropower facilities.

ENVIRONMENTAL ASPECTS OF NUCLEAR POWER

Compared with fossil fuels, the production of electricity through nuclear power generates virtually no emissions into the air. At the same time, the use of nuclear power entails responsibility for the highly radioactive spent fuel, which must be stored separately for a very long time. Nuclear power plants are subject to rigorous security and safety precautions, since malfunctions, transport accidents, terrorist attacks, etc. could have devastating consequences.

Nuclear power operations in Sweden are regulated via the Swedish Nuclear Power Inspectorate (SKI) and the Swedish Radiation Protection Authority (SSI).

Taxes and charges (2005)

Green tax shifting refers to the practice of raising taxes on negatives like energy consumption and environmental pollution, while reducing taxes on positives such as personal income and business revenue.

By government decision a green tax shift of SEK 30 billion is being carried out over the period 2001-2010, and has so far reached over SEK 10 billion. Green tax shifting in 2005 will amount to SEK 3.4 billion.

PROPERTY TAX

All electricity production plants are subject to a general industrial property tax equal to 0.5 percent of the taxable value of the property (both land and buildings).

NUCLEAR POWER

Electricity produced in nuclear power plants is subject to a fixed tax based on the thermal output of the reactors, amounting to SEK 5,514 per MW of thermal output and month, or SEK 66,168 per MW of thermal output and year. If a reactor has been out of operation for a contiguous period of more than 90 days, a deduction of SEK 181 per MW is permitted for the number of calendar days in excess of 90. The output tax corresponds to an average of 2.7 öre/kWh.

Electricity produced from nuclear power is also levied with a charge of 0.15 öre/kWh according to the so-called Studsvik Act, in order to cover the costs for handling of radioactive waste, etc., from Studsvik's previous operations.

In order to cover future costs for final storage of spent fuel, each nuclear power plant is charged an individual fee. For 2005 the fee is 1.2 öre/kWh for Forsmark, 0.6 öre/kWh for Oskarshamn, 0.7 öre/kWh for Ringhals and 0.2 öre/kWh for Barsebäck. The weighted average is around 0.9 öre/kWh. Furthermore, the reactor owners are required to pledge collateral for a total of SEK 9,690 billion.

TAX RATES FOR USE OF FOSSIL FUELS

According to the Energy Taxation Act, no tax is levied (i.e. a deduction is allowed) on fuels used for the production of taxable electricity. However, for fossil fuel-fired condensing power production, a standard 5 percent of electricity production is classified as untaxed internal electricity consumption, for which reason 5 percent of the supplied fuel is taxed. For fossil fuel-fired CHP production, 1.5 percent of the fuel for electricity generation is classified as internal consumption and is taxed.

Sulphur tax is levied at SEK 30 per kg of sulphur in SO_2 emissions from combustion of solid fossil fuels and peat. For liquid fuels, the tax is SEK 27 per cubic meter for each tenth of one weight percent of sulphur in fuel exceeding 0.05 percent. If the sulphur content is higher than 0.05 percent but lower than 0.2 percent, it is rounded up to 0.2 percent.

A nitrogen dioxide tax is levied at SEK 40 per kg of nitrogen oxides (designated as NO_2) from use of boilers and gas turbines with a utilized energy output of more than 25 GWh/year. The bulk of the fees are repaid to the taxable entities in proportion to their share of utilized energy production.

The tax rates applied for consumption of fossil fuels in 2005 are shown in Table 11.

CHP TAX

In a tax context, fuel consumed for electricity and heat production in CHP plants is allocated in proportion to the respective production types. At present, fuel used for heat production is exempt from the entire energy tax and 79 percent of the carbon dioxide tax. The full carbon dioxide tax is 91 öre/kg CO_2. No tax is levied on biomass or peat. The tax abatement rules are thus identical to those for the manufacturing industry including industrial back-pressure. In cases where multiple fuels are used, the order of fuels for taxation may no longer be chosen freely but is instead subject to rules for proportioning.

WIND POWER

Commercial suppliers of wind-generated electricity produced in Sweden are allowed to deduct part of the energy tax on electricity. The deduction is 9 öre/kWh for land-based wind power. For offshore plants located at sea or in Lake Vänern, the deduction is 16 öre/kWh.

Table 11	Energy tax		Carbon dioxide tax	
Light fuel oil *	7.4 öre/kWhf	735 SEK/m^3	26.3 öre/kWhf	2,609 SEK/m^3
Heavy fuel oil *	6.8 öre/kWhf	735 SEK/m^3	24.4 öre/kWhf	2,609 SEK/m^3
Coal	4.2 öre/kWhf	313 SEK/tonne	30.2 öre/kWhf	2,270 SEK/tonne
Natural gas	2.2 öre/kWhf	238 SEK/1,000m^3	18.1 öre/kWhf	1,954 SEK/1,000m^3

* Crude tall oil (CTO) used for energy purposes is levied with a special energy tax equivalent to the combined energy and carbon dioxide on low-taxed fuel oil, i.e. SEK 3,344 per m^3.

CONSUMPTION TAXES ON ELECTRICITY

Upon consumption of electricity, an energy tax is levied as of 1 January 2005:

a) 0.5 öre/kWh for electricity used in industrial operations or professional greenhouse cultivation.
b) 19.4 öre/kWh for electricity other than that referred to under a) and which is used in certain municipalities in northern Sweden.
c) 22.8 öre/kWh for electricity used for the supply of electricity, gas, heat or water.
d) 25.4 öre/kWh for electricity used for other purposes.

The development of electricity tax is illustrated in Diagram 25. For electricity used in electric boiler plants with a capacity of more than 2 MW, the energy tax for the period 1 November – 31 March is 21.8 öre/kWh and 25.4 öre/kWh with application of the rules under b) and c) above.

Agricultural and aquacultural operations are allowed an electricity tax refund for the difference between amount of tax paid and a sum computed according to a tax rate of 0.5 öre/kWh. The refund is permitted for that part of the difference exceeding SEK 1,000 on an annual basis.

Under the Energy Efficiency Act (PFE) that went into effect on 1 January 2005, energy-intensive companies that use electricity in the manufacturing process can qualify for tax-exemption by participating in a five-year energy efficiency program.

Electricity customers also pay fees for the financing of certain government administrations. All in all, high voltage customers will pay SEK 3,577 and low voltage customers SEK 54 in electrical safety, network monitoring and contingency charges in 2005.

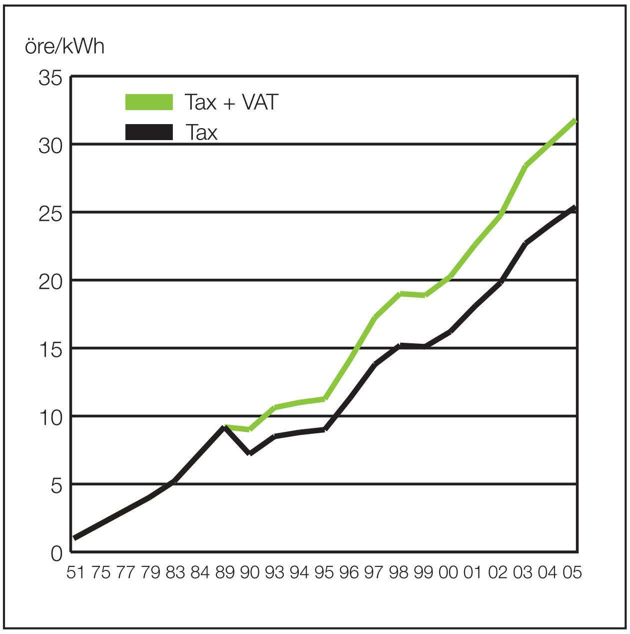
GREEN CERTIFICATES

Tradable Green Certificates (TGCs) were introduced on 1 May 2003. Under this system, which replaces earlier subsidies on renewable electricity production, a producer of renewable electricity is issued certificate for specific quantities of electricity that are generated. For each MWh of renewable electricity, the producer receives a green certificate that can be offered on the market as a tradable security. The buyers are electricity suppliers and electricity users. If the electricity user does not wish to manage the green certificates himself, the electricity supplier is automatically obligated to do so. The electricity supplier is then paid by the electricity user through the inclusion of a green certificate fee on the electricity bill. Each electricity user is obligated to purchase green certificates for a certain quota/percentage of his total consumption. The quota obligation in 2005 is 0.104 or 10.4 percent, which will be successively raised to 16.9 percent in 2010.

DIAGRAM 25

Development of electricity tax (energy tax on electricity) since 1951

Sources: Statistics Sweden and the Swedish Energy Agency



Compensation to producers of renewable electricity in 2005 has been set at a minimum of SEK 40/MWh (guarantee price), but could end up being closer to SEK 230/MWh. Based on the assumed production of around 10 TWh of quota-imposing renewable electricity in 2005, this adds up to total compensation of more than SEK 2,300 million.

TOTAL BURDEN OF TAXES AND CHARGES ON ELECTRICITY SUPPLY

In many ways, electricity supply is subject to a heavier burden of taxation and charges than other areas of Swedish industry and commerce. For 2005, taxes and charges particular to electricity supply are estimated as follows (excluding VAT):

	SEK million
Property tax on power production plants	750
Nuclear power tax and Studsvik charge	2,000
Certain charges for government financing	280
Tax on fossil fuels	100
Energy tax on electricity	18,000
Green certificate fee	2,600
TOTAL	**23,700**

Including VAT, total taxes and charges on the electricity sector amount to around SEK 34 billion in 2005.

Transmission networks

The Swedish power transmission system can be divided into three levels – local networks, regional networks and the national grid. Most electricity users are connected to a local network, which in turn is connected to a regional network. The regional networks are then connected to the national grid. There are 177 local network companies in Sweden.

The networks owned by these companies vary considerably in size. The smallest company has around 3 km of power lines, while the largest has over 115,000 km.

The local networks are normally divided into low voltage (400/230V) and high voltage networks (typically 10-20 kV). The total line length of Sweden's low voltage networks is nearly 350,000 km, of which 115,000 km consist of overhead lines and 235,000 km of underground cable. The local high voltage networks, also frequently referred to as medium voltage networks, are made up of 145,000 km of overhead lines and 73,000 km of underground cable. Some 5.2 electricity users are connected to the low voltage networks and 6,500 to the high voltage networks.

Most of the regional grid is owned by three companies, and has a combined line length of around 36,000 km. The national grid is owned and operated by the public utility Svenska Kraftnät, and is made up primarily of 400 and 220 kV lines with a total length of around 15,000 km. Table 12 shows the largest network companies.

In total, the Swedish electricity grid contains 620,000 km of power lines, including 260,000 km of underground cable. If the Swedish grid were stretched out in one long line, it would extend more than fifteen times around the earth. Delivery reliability in the Swedish grid is 99.97 percent.

The network companies' annual revenue from electricity users connected to low voltage networks amounts to SEK 19.3 billion, and 2.8 billion from those connected to high voltage networks.

The dependency of customers and society on a reliable power supply and the costs to electricity consumers in the event of a power outage have increased markedly over the past ten years. Surveys show that customer costs have risen by between 50 and 100 percent during this time, which clearly underlines the importance of improved durability in the transmission networks.

The industry is making an enormous effort to reduce the risk of outages – primarily in the Roslagen archipelago, certain parts of western Sweden and the southern province of Småland. The basic problem is the approximately 57,000 kilometres of uninsulated bare wire lines in the medium voltage network that run through forested areas.

Already in 2002 the power industry and the government formulated a joint program of additional measures to eliminate the large-scale outages of the past few winters by insulating, or burying, the affected lines over a period of 20 years. In the spring of 2004 the power industry agreed to a general halving of the timetable. At the same time, the three largest network companies – Vattenfall, Sydkraft and Fortum – have committed themselves to addressing these problems within only five years in their most vulnerable areas. The cost of these additional measures is SEK 10-15 billion. Since the start, an estimated 13,000 kilometres of line have been dealt with (of which close to half has been buried and the rest has been replaced with insulated lines). In addition, several network companies have significantly accelerated their clearing frequency, in many cases down to every fourth year compared with the previous eight-year interval. In the autumn of 2004 marked improvements were already noticeable in the addressed areas, and within three to four years will be even more tangible for many customers.

These activities are in line with the "zero vision" adopted by the industry to prevent disruptions in the transmission grid. The "Nätkic" (Network Customers in Focus) project, in progress since 2001, contains a number of network initiatives (aside from increased investment and clearing), such as:

- Far-reaching nationwide collaboration in the event of major power outages. The basic idea is for the companies to assist each other with personnel and materials when problems arise.
- A broad-based collaboration with the Federation of Swedish Farmers (LRF) and the agricultural industry, where farmers and line technicians cooperate in the event of major outages.
- Collaboration with the Swedish Broadcasting Corporation (Sveriges Radio), to provide rapid information mainly via local radio.
- Voluntary outage compensation. 80 percent of low voltage customers now have a network owner that applies "goodwill compensation".

It is technically possible to upgrade the transmission grid and improve delivery reliability, where customer requirements and socioeconomic considerations

Table 12

THE TEN LARGEST MEMBER COMPANIES IN SWEDENERGY BY NUMBER OF NETWORK SUBSCRIBERS
Source: Swedenergy

Member company (corporate group)	Network subscribers	Km regional networks
Sydkraft AB	972,861	7,904
Vattenfall AB	904,457	18,683
Fortum Power and Heat AB	904,260	6,513
Göteborg Energi AB	272,981	169
Lunds Energikoncernen AB (publ)	105,137	11
Mälarenergi AB	99,621	61
Tekniska Verken i Linköping AB	88,166	0
Skellefteå Kraft AB	65,153	1,004
Öresundskraft AB	64,455	54
Jämtkraft AB	61,358	564

are central to the overall assessment. Added to these are varying financial conditions between areas depending on specific geographical conditions such as the number of customers, positive or negative population growth, local soil conditions, etc.

In view of the growing dependency on electricity it is crucial that society, the power industry and the regulatory authorities have a clear vision of how to work towards achieving a transmission grid capable of meeting the reliability requirements of future generations. At the same time, the ongoing process of European harmonization and interconnection is placing increasingly rigorous demands on common guidelines and conditions for network operations.

JOINT ACTION IN OPERATIONAL DISTURBANCES

The country's network companies are taking their responsibility as owners and managers of a vital component of the national infrastructure that is of fundamental importance to society. A variety of measures to enhance delivery reliability have been taken and joint efforts by network companies to deal with large-scale disturbances are being systematized.

The industry, through Swedenergy and Svenska Kraftnät, has now completed the development of an electric power collaboration organization that will underpin a radical change in the entire contingency planning structure. The intention is for the organization to serve as a base for securing the power supply in a crisis or threat situation, an area for which Svenska Kraftnät has formal responsibility.

SUSIE Nationell is a web-based tool that has been developed for use during major disturbances and which also contains practical functions for day-to-day activities. The system has now been deployed and is available at www.elsamverkan.se. Svenska Kraftnät is the system owner.

PLANNING OBJECTIVES FOR DELIVERY RELIABILITY

Based on the power transmission sector's earlier planning objectives as defined in the "Delivery Quality" report (Elverksföreningen, 1991), new goals have been formulated that are more consistent with customer requirements.

The planning objectives consist primarily of dimensioning parameters for interruption duration and frequency at various levels in the networks, divided into individual events occurring during otherwise normal operating and weather conditions. These also include double line faults and major disturbances that can arise in extreme weather situations or due to sabotage, as well as uncommon and serious events affecting one or several components in an electric power system, such as a fire in an indoor switching station. Extreme weather situations that affect many system components simultaneously within a large geographical area are also dealt with.

Table 13

KEY STATISTICS ON SYSTEM INTERRUPTIONS IN LOCAL NETWORKS DURING 2003 WITH A DURATION OF MORE THAN 3 MINUTES

Source: Swedenergy

2003	SAIFI	SAIDI	CAIDI	ASAI		
Own networks	System Interruption Frequency	System Interruption Duration	Customer Interruption Duration	Service Availability	Total no. of interruptions	Total no. of customers affected
	no./year	no./year	min./year			
24 kV	0.2299	25.1548	109.4163	0.999952	3,150	859,369
12 kV	0.6154	93.2390	151.5032	0.999823	12,613	2,300,236
<10 kV	0.0084	0.7309	87.2674	0.999999	204	31,306
0.4 kV	0.0381	5.4388	142.7293	0.999990	21,847	142,425
Total	**0.8918**	**124.5636**	**139.6717**	**0.999763**	**37,814**	**3,333,336**

OPERATING EVENT STATISTICS (DARWIN)

2003 was a successful year for the DARWin statistics when more than half of the network companies, corresponding to over 70 percent of the customer base, reported their operating disturbances. For the first time, there are industry statistics that accurately reflect operating conditions in the Swedish local networks. The bar was raised further in 2004 and the goal is to cover at least 90 percent of customers.

Due to a lack of credible material for earlier years, it is difficult to assess network performance in 2003 relative to previous periods. Despite this, an attempt has been made using the system average interruption duration index (SAIDI) in a comparison with 2002. However, based on the available data it is not possible to draw any reliable conclusions as to whether the situation has improved or deteriorated in recent years. Table 13 shows the key indicators for system performance in 2004.

NETWORK PERFORMANCE ASSESSMENT MODEL

At the beginning of 2004 Swedenergy presented its perspectives on the viability of the Network Performance Assessment Model (NPAM). After circulation for comment in June, the Energy Market Inspectorate established the parameters to be included in the model. Prior to this, the Swedish Energy Agency had announced how it intended to apply the model (in a memorandum "The Swedish Energy Agency's regulation of power transmission tariffs according to the Network Performance Assessment Model"). Although the memorandum was not formally circulated for comment, Swedenergy nonetheless decided to submit its views. In particular, Swedenergy objected to the Agency's intention to publish debiting ratios and to the criteria that a ratio of over 1.0 would be regarded as indicating an unreasonable network tariff.

In connection with the network companies' reporting of data to Swedish Energy Agency for use in NPAM (STEMFS 2003:3), much time was devoted to discussion and "mediation" between the industry and the Agency. For example, there was considerable uncertainty about what indata would be exempted from reporting to NPAM for reasons of confidentiality, which created extra work for the network companies and delays in the reporting process.

Based partly on calculations according to the model, the Swedish Energy Agency selected some 40 companies for in-depth review at the end of December. By year-end the Agency had not yet issued any final rulings on tariff levels in 2003 and it will not be clear how the Agency will apply the model in tariff regulation until some time during 2005.

In the autumn of 2004 Swedenergy conducted an in-depth analysis which showed that NPAM has significant shortcomings and is therefore not viable as the sole instrument for determining the reasonability of network tariffs. The most significant conclusion of the study is that the model does not effectively reward high quality in the transmission grid, nor does it provide a general incentive for improved quality in the Swedish local networks.

METERING ISSUES

During the year, Swedenergy and representatives from the member companies have taken part in the Swedish Network Authority's (now EMI) reference group for formulation of new metering regulations. This work has been supported by an internal committee including members from both power transmission and supplying companies and legal experts. The schedule that was presented at the start of this process, with year-end 2004 as the target date for completion, was not met. In all likelihood, the regulations will not be completed until year-end 2005.

Swedenergy's representatives to the reference group have proposed a number of changes to the draft presented by the Network Authority. Due to delays in adopting the regulations, many network companies have waited to order the system since they "were not familiar with the rules", in their own words. Ministry efforts to finalize the Metering Ordinance, which by rights should precede the regulations, have also been fruitless, creating yet another obstacle for orderers of the new metering system. Swedenergy has spoken with Ministry representatives involved in drafting the Ordinance to clarify issues of particular interest to the industry.

At the end of 2004, Swedenergy and Elforsk launched a collaborative metering initiative and three well attended seminars were arranged on different themes. This work has resulted in a division of tasks between the parties. The ultimate goal of the collaboration is to present a de facto standard for household meters according to the IEC's previously defined DLMS-Cosem standard. The intention is also to obtain approval as a IEC/Cenelec standard, a process that is expected to take two years.

Despite the lack of an official ordinance, regulations and an amendment to the Swedish Electricity Act, some 0.8 million metering systems were ordered in 2003-2004 and around 0.5 million of these have been installed.

REASONABLE CONNECTION FEES

In 2004 Swedenergy set up a working group to review industry practices for setting connection fees. Regular meetings with the Swedish Energy Agency were held to discuss the structure of connection fees and conditions for connection to the network. The goal of this work has been to reach consensus with the Agency on the basis for calculating connection fees. At present, the network companies calculate these fees on grounds that differ markedly from the methods used by the Swedish Energy Agency to determine reasonable connection fees, which leads to many complaints to the Agency.

Towards the end of the year an industry recommendation was drafted for the formulation of a price indication for initial connection of consumers (NÄT2004 K) and commercial enterprises (NÄT2004 N). These activities and regular meetings with the Swedish Energy Agency will continue in 2005 and require ongoing commitment from Swedenergy.

CUSTOMER OFFENSIVE/NETWORKS

One area where Swedenergy is working for the benefit of customers is to promote a more efficient flow of information between players in the electricity market. As part of this effort, Swedenergy has advocated the implementation of a uniform system for plant identification and the use of social security numbers for identification of customers. Swedenergy has also called for a change whereby an electricity customer is defined as the holder of a network subscription. The Electricity and Gas Markets Commission has now proposed that this be carried out.

Another step in improving the flow of information has been to study how the exchange of information can be facilitated by analyzing which information the various players need and how it should be made accessible. A feasibility study was carried out during the year and a decision was made to proceed with this work.

ADVICE

In 2004 Swedenergy continued to provide extensive telephone and e-mail advice in areas related to power supply and transmission. In addition, considerable attention has been focused on informing the public about Swedish Energy Agency and court rulings on various issues, ongoing studies by government ministries and agencies and civil rights aspects of the power companies' operations. For example, one key activity during the autumn was to provide information about the revised general terms and conditions in power transmission and supply agreements (Nät 2004 K, N and H and EL 2004 K and N).

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962x99-092
/+68%-8x537
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