Svenska Kraftnät
Annual Report 2003

Svenska Kraftnät

2003 in brief

Operations during the year

Energy entering the grid amounted to 117.7 (125.2) TWh*.

The outage on 23 September caused disruptions to deliveries amounting to approx. 10,400 MWh.

In addition to this, there were 197 (293) operational disruptions on the grid – the majority being caused by thunderstorms. Of these, 27 (23) disruptions entailed supply outages for customers. The energy non-deliverable as a result amounted to 17 (49) MWh.

* Figures in brackets are for 2002.

Financial data in brief

- Total operating revenue for the Group was MSEK 3,982 (3,841).
- Net income for the year was MSEK 288 (541).
- The Groups' return on adjusted equity, after 28% tax equivalent, was 3.5 (6.6)%.
- The debt-equity ratio was 0.49 (0.50).
- The ratio of owners' equity to total assets was 56.7 (55.2)%.
- Investments in the Group amounted to MSEK 411 (MSEK 460, incl. a capital increase in Nord Pool). Of these, MSEK 293 (235) was invested in the grid, MSEK 47 (85) in opto links, MSEK 33 (1) in gas turbines, MSEK 20 (13) in the SwePol Link, and MSEK 18 (8) in intangible assets.

Our mission is

- To offer reliable, efficient and environmentally-adapted transmission of electricity on the national grid.
- To manage the system responsibility cost-effectively.
- To promote an open Swedish, Nordic and European electricity market which is exposed to competition.
- To work towards a robust and flexible electricity supply.

An outline of Svenska Kraftnät

Svenska Kraftnät is a public utility which began operations on 1 January 1992. The company runs Sweden's national power grid and has system responsibility for the national electricity supply. This responsibility means ensuring that the power system is in balance in real time and that the connected plants and installations work together in a reliable way. The grid includes a total of approximately 15,000 km of 220 kV and 400 kV power lines, cross-border interconnectors and substations. Svenska Kraftnät also operates control systems, IT-systems and opto fibres for broadband communications.

Svenska Kraftnät employs approximately 270 people. Our head office is in Vällingby, Stockholm, where the national control centre Network Control also is located. There are also offices in Halmstad, Sundsvall and Sollefteå, where there is a control centre for the northern part of the national grid. We also have a training centre for linesmen at Åsbro, outside Örebro. Svenska Kraftnät also provides work for a few hundred more people via subcontracts to operate and maintain the grid all across the country.

Svenska Kraftnät is also a group which, during 2003, consisted of three subsidiaries and seven associated companies, the largest of which was the Nordic power exchange Nord Pool.

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Important operational events

January

- The reservoirs of the hydropower plants were at a low level due to the dry weather during the autumn of 2002. The electricity demand during the winter season peaked at approx. 26,200 MW on 9 January. The price of electricity on the Nord Pool spot market then reached about SEK 1.00/kWh.

February

- The extended substation at Sege near Malmö was ready to go into service. Here we have installed 400 Mvar shunt capacitors to regulate the voltage. This investment of MSEK 35 at the station has augmented the grid capacity in southern Sweden.

March

- Svenska Kraftnät reported on the status of the expansion of the national optical network for broadband communications, in accordance with our government assignment. The optical network had reached 215 (74%) of the country's 290 principal municipal centres.
- Within the program for the remaining electrification of the country, as decided by Parliament, Svenska Kraftnät has allocated MSEK 6,3 to twelve remote dwellings.
- Operations during 2002 were presented at Svenska Kraftnät's annual Customer and Associate Day.

April

- Former government minister Sven Hulterström took office as the new Chairman of Svenska Kraftnät's Board after Director Per-Olof Eriksson.
- Svenska Kraftnät, together with the power industry, the Swedish National Energy Administration and Swedish Trade and Industry, investigated changes to the balance service's rules. The objective was to improve the possibility of increasing the number of balance providers, primarily major power consumers.

May

- The national system of renewable electricity certificates came into force on 1 May. Svenska Kraftnät's brief is to issue and manage the certificates.
- A new system transformer at Grundfors was comissioned. The transformer, which cost MSEK 26, has boosted our capacity to transmit power to Norway.
- Svenska Kraftnät allocated a further MSEK 7.1 to eight remote settlements for connection to the grid or other power supply. In doing so, a total of MSEK 50 has been allocated to remaining electrification work since 1999.
- Svenska Kraftnät decided to increase the grid tariff in 2004. This had remained unchanged since 1998. The background to the increase is rising electricity prices.
- Svenska Kraftnät and Eltra embarked upon the renewal of the Kontiskan 1 DC link between Sweden and Jutland. The power converter stations at Stenkullen, outside Gothenburg, and Vester Hassing, in Jutland, are being replaced by new stations at a total cost of approximately MSEK 400. The new Swedish station will be located closer to the coast at Lindome. The capacity of the link will be boosted from 270 MW to 360 MW.

August

- We reported on the power balance on the Swedish electricity market during the past winter. At the same time, we made a forecast regarding the power balance for the coming winter.
- Svenska Kraftnät procured 1,800 MW of reserve power. This is an element of the transitional solution that Parliament has adopted in order to safeguard the supply of peak power in Sweden.

"An important part of Svenska Kraftnät's operations is the settlement of flows of power over the grid, which requires powerful computer support", says unit manager Maria Jäderberg (on the left). Each day, large numbers of reports from the country's network owners arrive at Svenska Kraftnät. Then we calculate the usage of the Grid and Balance Services and produce the correct invoicing data. Maria is ably assisted by Christina Eriksson and Kurt Lindgren.

September

- A new control installation went into service at the Hagby substation, north of Stockholm. This installation has cost MSEK 24.
- On 23 September, a widespread power outage occurred in southern Sweden, south of a line between Norrköping and Varberg, and in eastern Denmark. The outage was due to the combined effect of a fault at Oskarshamn nuclear power station 3 – which was tripped – and a fault in a switchyard in western Sweden, which led to two power stations at Ringhals being disconnected from the grid.
- Svenska Kraftnät's mobile repair team took part in the international exercise "Nordic Peace 2003" in Finland.

October

- The final stage of the rebuilt switchyard at Hemsjö, in southern Sweden, was comissioned. The refurbishment, which cost approximately MSEK 100, has augmented the grid capacity in southern Sweden.

November

- Sunspot activity triggered some problems in Sweden's power system. A few lines and transformers were disconnected from the grid. There were no outages for customers due to events on the national grid.
- Svenska Kraftnät presented an analysis of the outage on 23 September. The report also detailed measures for further strengthening of the grid reliability. Among other things, we will review how the maintenance of our installations is organised and bring forward a programme to renew critical 400 kV switchyards.

December

- During the year, Svenska Kraftnät issued over five million renewable electricity certificates.

"From 1 May 2003, when the renewable electricity certificate system was introduced in Sweden, up until the end of the year, we have issued and registered over five million certificates. We also regularly supply information about the price of sold certificates", says Jenny Fridström, on the left. The working group also includes, from the left, unit manager Magnus Stephansson, Annika Lööw and Conrad Carlsson.

A word from the Chairman

Following several years of good financial results, our result during 2003 was lower than normal. The fundamental reason is that the dry year caused Svenska Kraftnät higher costs and lower revenues than normal. To this, we can add that the price of energy in the energy part of the grid tariff has been very low. The tariff has now been adjusted to a level which is deemed better able to reflect the long-range price trend for electricity.

Svenska Kraftnät continues to have the lowest grid tariff in Europe.

The outage of 23 September, the first one of any great magnitude for Svenska Kraftnät, has given rise to a raft of measures aimed at further augmenting the robustness of the grid. Among other things, the projecting of a 400 kV line from central to southern Sweden has been embarked upon.

However, it is important to stress that augmented transmission networks alone will not be able to safeguard the electricity supply. The margins in the electricity generation system are small and it is my assessment that new electricity production is needed in order to achieve a satisfactory power supply in Sweden in the future. This applies in particular to southern Sweden.

This has been my first year as Chairman of Svenska Kraftnät. I can honestly say that collaboration on the Board and between the Board and management has been good. My initial impression remains; that Svenska Kraftnät is a stable and competent company well equipped for its responsible duties on the Swedish and Nordic electricity markets.

Stockholm, February 2004

Sven Hulterström

Sven Hulterström, Chairman of the Board of Svenska Kraftnät.

A word from the DG:

Another unusual year

In our last annual report, I described 2002 as "an unusual year". This was primarily due to the uneven supply of hydropower in the electricity system: a lot at the beginning of the year and little at the end. On top of this, the dry summer produced lots of thunder storms. The outages were few, however, and local.

This year was even more dramatic for our part. The scarcity of water kept electricity prices very high during the spring and rather high during the summer and autumn. An unusual transmission pattern – less from north to south – provided us with reduced grid revenues. The high price of electricity led to increased costs for procurement of grid losses and primary regulation. Compared to a normal year, these costs were approximately MSEK 250 higher and grid revenues approximately MSEK 150 lower. This meant that Svenska Kraftnät was not able to achieve its required yield during 2003.

Increased usage fee in 2004

We expect that the price of electricity will be higher in the future than the very low price level which has been the case for a few years at the beginning of the new millennium. We have thus adjusted the energy part of the grid tariff so that the price of electricity better reflects the future cost level. The change, which has the support of our Market Comittee, will entail an average increase from SEK 0.012 to SEK 0.013 /kWh.

Major outage

The widespread outage on 23 September was, of course, a one-off event. At 12.30, the largest reactor at the Oskarshamn plant was stopped due to a faulty valve. Just under five minutes later, a disconnector failed at our substation in Horred near the west coast. An arc caused a short-circuit between two bus bars, entailing two nuclear power stations at Ringhals being "closed in". In doing so, we were hit by the disconnection of three major production plants and a severely weakened grid, all within the course of a few minutes. This was more than the system could bear and the voltage on the grid on the east coast collapsed as a result. The outage affected southern Sweden, south of a line between Varberg and Norrköping, as well as eastern Denmark.

Restoration of the supply went quite quickly. After an hour, there was voltage on the grid down to the southernmost parts of Sweden. Connection of the local networks was then able to take place at a pace allowed by the production capacity. By 6 pm, all consumption throughout Sweden was reconnected. In eastern Denmark, there was a further delay of about an hour or so.

On the evening of the 23rd, we were able to tentatively report on the causes of the outage. On 25 September, our initial report was released, containing a detailed description of the course of events. On 4 November, we published a more detailed analysis, including a report on the measures we were intending to take. At the same time, a corresponding report was made by our counterpart in Zealand, Elkraft System, whom we were collaborating closely with.

We are now implementing a number of measures. Together with other Nordic grid operators, we are reviewing Nordel's grid security guidelines. The preliminary projecting of a new 400 kV line from central to southern Sweden has started. We have decided to rebuild the substation at Horred and do an overhaul of other older switchyards. An overhaul of disconnectors is also under way.

The demands placed on the electricity supply by a modern society are great – and should be so. It is my assessment that we have a robust electricity system in Sweden, especially at national grid level. The measures we are currently taking will make the grid even more robust.

Nordic and European electricity market

Nordic electricity collaboration continued during the year. Among other things, an initial draft was made of a Nordic grid investment plan.

Additionally, extensive work is being carried out to harmonize, in the long-term, the management of the capacity to cover peak demand in the Nordic area. Here, however, there are some basic differences between the countries. Particularly in Sweden and Finland, there is an emphasis on the players active on the electricity market also being responsible for the electricity supply being sufficient, while other countries would more seem to be reliant upon authority responsibility. It is my assessment that it will be necessary, in the long-term, to have clear and uniform liability conditions in these respects in order that we can fully and completely have a single electricity market in the Nordic area.

The trend in Europe is based on greater differences in the organisation and composition of the electricity systems than is the case in the Nordic area. This is also making the European Commission advocate stronger regulation and authority supervision in order to harmonize the electricity systems and develop a single electricity market. This may be necessary in some places, but here in the Nordic area, there is nothing to be gained, in my view, from such increased bureaucratization. We have, of course, been able to demonstrate that electricity markets can be opened up and coordinated without micro-management – perhaps even due to the absence of this.

Jan Magnusson, Director General.

The Nordic power exchange Nord Pool continues to be the most successful power exchange in Europe. However, 2003 was the first year when Nord Pool did not enjoy any growth in volume, something which we have become accustomed to. Volumes on the spot market were approximately the same as during 2002. On the financial market, volumes were also relatively unchanged as regards financial turnover, but were down sharply in terms of the turnover of energy. The primary reason for this is that the high prices and the volatility of the market, at certain times during the year, sharply increased demands for financial securities from the players. This had a restraining effect on trading volumes.

Skilful employees

Not least during the outage of 23 September and in the following up, my employees at Svenska Kraftnät showed great qualities. Restoration of the grid was achieved under considerable pressure working against the clock at the National Control Centre. The work of analyzing the situation put us on the right track the very same afternoon and was subsequently intensified. The report containing the proposed measures was drawn up quickly and efficiently.

I would like to thank all my employees for their fine efforts during 2003. Some of them appear in this annual report, telling us about their work.

Stockholm, February 2004

Jan Magnusson

The Svenska Kraftnät Group

Subsidiaries

SwePol Link AB
The mission of the company is to operate and maintain a DC link between Sweden and Poland. The link is rated at 600 MW.

Svenska Kraftnät's stake is 51%, Vattenfall AB owns 48% and the Polish grid operator Polskie Sieci Elektro-Energetyczne SA owns 1%.
Turnover during 2003: MSEK 280 (304)

SwePol Link Poland Sp.z.o.o. is a wholly-owned subsidiary of SwePol Link AB. This company owns the part of the DC link in Polish territory.
Turnover during 2003: MSEK 82 (100).

Svenska Kraftnät Gasturbiner AB
The company, which is wholly-owned by Svenska Kraftnät, owns and operates gas turbine power plants. The company was established in 1999 to enable Svenska Kraftnät to ensure, in the long-term, resources for stand-by emergency reserves to the power supply system.
Turnover during 2003: MSEK 88 (52).

Svenska KraftKom AB
This company is wholly-owned by Svenska Kraftnät. During 2003, the operations of this company have been insignificant. Last year, for the public utility's account, a certain amount of development and marketing was conducted in the telecom sector.
Turnover during 2003: MSEK 0 (2).

Associated companies

Nord Pool ASA
Nord Pool ASA is an exchange for financial trading on the Nordic electricity market. The head office is in Oslo, with branch offices in Stockholm, Helsinki and Fredericia. Nord Pool is also active on the European market, for instance through owning 17% of the German power exchange EEX.

During 2003, trading on the futures market amounted to 545.1 (1,018.5) TWh. The clearing operation amounted to 1,218.6 (2,088.8) TWh.

Svenska Kraftnät owns 50% of Nord Pool ASA, the other 50% being owned by Statnett SF.
Turnover during 2003: MNOK 213 (300).

Nord Pool Spot AS
The physical trade in electricity, the spot market, is conducted via a separate company: Nord Pool Spot AS.

The company is owned by Svenska Kraftnät, Statnett SF, Nord Pool ASA, Fingrid Oyj, Elkraft System a.m.b.a. and Eltra a.m.b.a.
Turnover during 2003: MNOK 36 (64).

The Nordic power exchange Nord Pool is the world's most successful power exchange. In March 2004, the power exchange opened a trading centre for Swedish renewable electricity certificates, which will benefit renewable energy.

Nord Pool Consulting AS
This company sells consultancy services on deregulated electricity markets. Assignments are carried out using in-house staff as well as experts on loan from the owners. The company has an office in Oslo adjacent to Nord Pool's head office.

Svenska Kraftnät owned one third of the company up until 31 December 2003, when this stake was sold to Nord Pool ASA. The other co-owners are Nord Pool ASA and Statnett SF.
Turnover during 2003: MNOK 8 (9).

Triangelbolaget D4 AB
On behalf of its co-owners, the company administers the opto links Stockholm-Oslo-Göteborg-Malmö-Stockholm. Revenues from leasing go directly to the co-owners.

The company is owned in equal shares by Svenska Kraftnät, Vattenfall AB, Fortum Distribution AB and Sydkraft Bredband AB.
Turnover during 2003: MSEK 19 (106).

Kraftdragarna AB
Kraftdragarna AB's primary mission is to secure, on behalf of its owners, transport readiness regarding transformers, reactors, and other heavy components in the electricity supply system.

Kraftdragarna AB collaborates with Statnett Transport AS in order to further augment its readiness ahead of breakdown transportation.

Svenska Kraftnät owns 50%, Vattenfall AB 25%, and Vattenfall Regionnät AB 25% of the company.
Turnover during 2003: MSEK 13 (18).

STRI AB
This company conducts R&D in the power transmission sector, mainly as commissioned by its owners.

Svenska Kraftnät owns 25%, ABB AB 50%, Statnett SF 12.5% and Vattenfall AB 12.5 % of the company.
Turnover during 2003: MSEK 50 (50).

Elforsk AB
Elforsk conducts joint operations in R&D on behalf of the Swedish power industry.

Svenska Kraftnät is primarily involved in the parts concerning the transmission of power and the evolution of the electricity market. The most important focal points are environmental issues, the maintenance and renewal of installations, and supporting the projects of doctoral candidates.

Svenska Kraftnät owns 25% while trade organization Swedenergy owns 75% of the company.
Turnover during 2003: MSEK 107 (74).

Report of the Board of Directors

The reported figures are for 2003, with comparative figures for 2002 in brackets.

Organization and operations

During 2003, the Svenska Kraftnät Group consisted of three subsidiaries and seven associated companies in Sweden and Norway. On 31 December, associated company Nord Pool Consulting AS was disposed of to another associated company, Nord Pool ASA.

Svenska Kraftnät's main mission is to manage and run Sweden's national grid and overseas interconnectors. Svenska Kraftnät is also the system-responsible authority under the Electricity Act, which entails being responsible for the momentary electricity balance on a short term basis and the overall reliability of Sweden's power system. Additionally, Svenska Kraftnät is also the power contingency authority under the Power Contingency Act, and is thus responsible for the energy supply sub-function of the civil sector of Sweden's total defence.

Svenska Kraftnät's business operation

The objectives that the government has set out in its appropriation document for 2003, in respect of Svenska Kraftnät's business operations, are described below.

Financial targets

Svenska Kraftnät must achieve an average return on adjusted equity[1], after deductions for tax equivalent, of 6%. In 2003, the calculation of adjusted equity was changed so that restricted reserves are now included at 100% instead of 72%, as previously. This was mainly compensated for by lowering the yield requirement from 7% to 6%. In reality, the change entails an increase in the yield requirement of 0.2 percentage points. Costs for remaining electricity work of approximately MSEK 10 per annum and power supplements of approximately MSEK 15, which Svenska Kraftnät procured on the instructions of the government, are to be met using profits.

Our return on adjusted equity was 3.5 (6.6)% , entailing that we fell short of our target of 6%. The reason for the low earning capacity was the extraordinary hydrological situation which provided Svenska Kraftnät with lower revenues and higher costs than usual. When costs for power supplements and remaining electrification work are deducted, the return is 3.7%.

The debt-equity ratio[2] was 0.49 (0.50), which falls short of the target of at least 0.55.

The distribution of profits policy is that 65% of the income for the year will be distributed to the Swedish government.

Reliability

On 23 September, a major outage occurred which left southern Sweden without power for between one and five hours. The loss of supply is estimated at 10,400 MWh.

Beside this event the number of technical incidents on the grid was 197, of which 26 entailed loss of supply for customers. The non-delivered energy amounted to 17 (49) MWh. The number of disruptions was primarily due to widespread thunderstorms during the summer. Below left, the number of service disruptions due to faults on the national grid during a five-year period is shown.

Cost-effectiveness

Our cost-effectiveness must be on a par with comparable companies. Our effectiveness is measured against other corresponding companies using comparative studies. These studies have shown that Svenska Kraftnät is one of the most cost-effective grid operators in the world. This enables Svenska Kraftnät to maintain low grid tariffs, as indicated in the diagram on page 14.

R&D

Svenska Kraftnät's R&D work is primarily carried out via assignments given to the jointly-owned development companies STRI AB and Elforsk AB. Additionally, Svenska Kraftnät supports PhD candidate projects and degree work at universities of technology.

The weather has a major impact on the grid as regards transmission losses, grid reliability and utilization. The development operation within this field is conducted at STRI AB together with grid operators Statnett (Norway) and Fingrid (Finland). With the help of local weather forecasts, the objective is to:

[1] By adjusted equity is meant the average of the restricted equity at the start of the year and at year-end plus 72% of the unrestricted equity.
[2] The debt-equity ratio is defined as interest-bearing liabilities minus interest-bearing assets divided by the adjusted equity at year-end including minority shares.

	2003	2002	2001	2000	1999
Disruptions due to fault on the national grid, no.	198	293	211	194	228
As above but with outages, no.	27	23	14	5	10
Non-deliverable energy, MWh/annum	10,417	49	23	91	96

- Increase the utilization of lines and station equipment.
- Reduce line losses caused by corona arising from hoar-frost via voltage control.
- Predict and reduce the risk of service disruptions during severe weather conditions.

Together with other system operators in the Nordic area, Svenska Kraftnät is involved in the development of optimizing the operation of the Nordic power system through a project at the SINTEF research institute in Norway.

Svenska Kraftnät and the Swedish National Energy Administration are taking part in a large-scale EU project which will run for five years. The project will analyze how power systems change when renewable production is introduced on a large-scale in the future European power system. STRI AB and Lund Institute of Technology are doing the work for Sweden.

R&D is also being supported in the dam safety area. During the year, MSEK 3 has been spent on twenty or so projects. All of these have been co-financed with the Swedish power industry and, in some cases, with other interested parties via Elforsk AB. Among other things, the stability and damage of dams has been studied using full-scale tests in collaboration with interested parties in Norway and Canada. In another project, which has river Ljusnan as a pilot case, dam owners, municipalities and county administrations are working to produce a prototype for joint contingency management for dam breaches and high flows. The project, which will run for two years, is estimated to be completed in 2004.

During 2003, Svenska Kraftnät spent MSEK 15 (20) on R&D.

Nordic and European collaboration

The Nordic System Operators' coordinating body, Nordel, has conducted a number of projects during the year aimed at further developing the Nordic market. As regards network expansions in the Nordic area, work is now focusing on closely analysing some of the projects reported upon in the 2002 system development plan. The final report will be submitted in the summer of 2004.

The issue of how the supply of power during peak-demand can be maintained on an open electricity market is relevant in all the Nordic countries. The solutions chosen thus far, however, differ fundamentally between the countries. Together with the Nordic Council of Ministers, Nordel has embarked upon development work aimed at producing, on a Nordic basis, proposals for long-term mechanisms and solutions which can, on a commercial basis, safeguard the balance between supply and demand during critical situations. The results of this work will be reported upon in the spring of 2004. The project has several parts:

- Price elasticity in the demand for electricity when prices are high.
- Harmonization of legislation and rules.
- Financial products for hedging during power shortages.

Balance regulation has been coordinated throughout the Nordic area to the point where it is now common to all countries. This means that regulation is done in the part of the Nordic system where the cost is at its lowest.

During the year, Nordel has published a report regarding the prerequisites for additionally harmonizing the rules of balance settlement. In Norway, one-price settlement is used while other countries use two-price settlement. The latter entails that balance companies with an imbalance "in the wrong direction" in relation to the entire system will be charged more. The reason is to create the incentive for companies to maintain their balance – thus contributing to a state of balance being achieved throughout the system.

Another difference concerns how the cost data is defined for the balance service. In Sweden and Finland, part of the emergency reserve is financed via the balance service. In Sweden, the costs of the power reserve that Svenska Kraftnät has to maintain during a transitional period in the balance service are also included. In Norway and Denmark, the corresponding measures are financed via the grid tariff.

The circulation for comment of Nordel's report shows that the players on the Nordic market do not seem to consider the differences between the countries' balance settlement rules so troublesome that Nordic harmonization needs to be a short-term requirement. Instead, the importance of harmonization within other areas, e.g. bottleneck management and the management of the power balance, was stressed. Nordel has thus decided, until further notice, not to pursue this issue.

For a couple of years now, work has been ongoing within Nordel to draw up common rules for managing bottlenecks in the network. The objective is to lay down common rules of play for managing capacity at the borders and to take measures which reduce the risk of dividing the market up into price sectors. This can take place using new methods of efficiently utilizing existing transmission capacity and via increased counter-trading between countries. A report is expected during the spring of 2004.

For several years, Nordel has been working with the development of a system to achieve financial settlement between the grid operators regarding the costs arising from transit power, i.e. utilizing someone else's network. During 2003 and 2002, the Nordic grid operators compensated each other for their variable expenses, i.e. costs for transmission losses caused by transit power. The outcome for 2003 was a net income of MSEK 23 for Svenska Kraftnät.

In 2004, the Nordic grid operators will take part in the system of transit compensation devised by the European grid operators' coordinating body, ETSO. In doing so, there will no longer be a need for internal Nordic transit compensation. ETSO's system includes compensation for fixed as well as variable costs arising from transit power.

June 2003 saw the adoption of the European Parliament's and the European Commission's proposal for changes to the electricity market directive and a proposed regulation regarding the terms and conditions governing access to the networks for cross-border power trading. The changes to the directive entail, among other things, increased market penetration, requirements for a distinction for system operators regarding transmission and distribution, requirements for separate accounting, rules for network access, and the establishment of an independent supervisory authority which approves in advance the tariffs or methods of tariff setting, as well as certain issues concerning the system responsibility. The regulation governing cross-border trading includes, among other things, stipulations about financial compensation for transit flows, harmonisation of national network tariffs and bottleneck management.

In December 2003, the Electricity and Gas market – European Harmonization (SOU 2003:113) report was unveiled, containing proposals for legislation changes as a consequence of the new electricity and gas market directives. The changes are proposed to come into force on 1 July 2004.

The European Commission presented, in December 2003, its proposed measures for augmenting the security of supply of the electricity market.

Svenska Kraftnät's contingency planning

Here is a description of the measures implemented as a part of Svenska Kraftnät's contingency planning during 2003.

Contingency organisation

The new contingency organisation, which Svenska Kraftnät is developing in collaboration with electric supply industry organisation Swedenergy, is based on the cooperative organisation for management of repair work-forces during outages, established by the industry. During the distribution outages managed during the year, parts of the joint-action organi-

sation were involved, with good results. During the year, a new mobile radio communication system, Mobielex, was developed with Mobitex as the national carrier. The system is being tested during the winter of 2003–2004 in collaboration with Vattenfall AB. The intention is that the system will, in due course, be able to work as a joint mobile radio system for the electricity industry.

Crisis management training

During the year, approximately 500 power company employees have been trained in operative action, which Svenska Kraftnät is conducting in collaboration with Swedenergy. This training has been going on for four years and has shown positive results.

Technical contingency measures

The work of creating secure stand-by control locations, which began in 2002, continued in 2003 when four operating centres were supplied with stand-by equipment. The gas turbines at Hallstavik, which subsidiary Svenska Kraftnät Gasturbiner AB acquired in 2002, have been enhanced.

Repair resources and international aid

Svenska Kraftnät has taken part in the exercise Nordic Peace 2003 in Finland, with a mobile repair crew. Our participation came under the framework of Sweden's Partnership for Peace collaboration.

Equipment for two repair crews exists at Svenska Kraftnät's training and storage facility at Åsbro.

At Åsbro, there is also equipment for rapid repair work in the event of line damage on the grid and regional networks.

Training of persons on civil duty and employed fitters

During 2003, Svenska Kraftnät provided basic training for 85 persons on civil duty at Åsbro for repairs of power lines and switchyards, as well as 41 power station operators at the Vattenfall Training Centre at Jokkmokk. Refresher training has taken place of 109 persons on civil duty. Evaluations carried out by the Civil Duty Council and the respective training school have been positive.

August saw the start of an enquiry "Resources for repairs" which will submit proposals regarding, among other things, the level of ambition and the focus of civil duty training. The enquiry is to be completed by December 2004.

During the year, Svenska Kraftnät has conducted, for the fifth time since 1998, supplementary training for employed fitters. The purpose of this training is to provide fitters, who normally work on lower voltage lines, with knowledge of repairs on the grid and regional networks.

External and internal, risk and vulnerability analyses

According to the new contingency ordinance, Svenska Kraftnät has to conduct risk and vulnerability analyses and annually report the results of these to the government. During 2003, methods regarding how analyses can be conducted in collaboration with the electricity industry and collaborating authorities have been studied. An initial combined report is estimated to take place in 2005.

Dam safety

During 2003, the focal point of dam safety work has been supervision, contingency organisation and the provision of expertise. To facilitate the county administrations' supervision of dam safety, a manual has been produced. A special project has been conducted in order to find out how our preparedness should be developed as regards dam breaches and high flows. During the year, a requirement study regarding college education and research has been conducted in collaboration with Elforsk AB.

Remaining electrification work

Subsidies for remaining electrification work have, since 1999, been provided on the instructions of the government. Decisions were made on two occasions during 2003 as regards subsidies totalling MSEK 13 for electrifying 20 remote dwellings. In doing so, the available funds for 2003 were utilized, including residual funds from the previous year. Costs arise and are reported in step with the work being carried out.

Risk assessment

For Svenska Kraftnät, commercial risks are deemed limited.

The transmission activity is both long-term and stable. Svenska Kraftnät's customer base mainly consists of well-established and stable companies with good equity/assets ratios. Svenska Kraftnät, by virtue of its international operation, is partially exposed to financial risks, primarily currency risks in conjunction with the translation of foreign net assets and results. Interest rate risks in connection with liquidity and liability management are small, since Svenska Kraftnät's equity/assets ratio is high and its volume of borrowing low.

During 2003, Svenska Kraftnät procured electricity to cover transmission losses at a fixed price, in accordance with multi-year agreements.

Utilization of the grid is affected by the hydrological situation, by production levels at thermal power stations, and by exports/imports. During extensive hydropower production, and the resulting high transmission from northern to southern and central Sweden, Svenska Kraftnät's revenues rise. Conversely, grid revenues fall when the supply of hydropower is scarce and the import volume from the south is great. These fluctuations in the result can, as a consequence of this, amount to several hundred million SEK. Thus, an assessment of Svenska Kraftnät's result has to apply to average conditions over a period of several years.

Svenska Kraftnät has the system responsibility for Sweden's electricity system, as well as the responsibility for balance settlement vis-à-vis the balance providers. To reduce the credit risk posed by national balance settlement, Svenska Kraftnät demands financial security from the balance providers. Guarantee requirements have been tightened during 2003 as a consequence of rising electricity prices.

The optical fibre activity has been conducted in accordance with the objective given to us by the government. In the autumn of 2001, Svenska Kraftnät informed the government that expansion to some municipalities could not be carried out on a commercial basis. The expansion of Svenska Kraftnät's optical fibre network has been going on at a reduced pace for the last year and has primarily focused on the needs of the grid.

The potential risk of disruptions causing serious consequences for customers on the grid is still deemed slight. The grid is robustly built and has good opportunities for reserve feeds, entailing that if one line becomes disconnected, power can take other routes to the customer. The risk of a major outage cannot, however, be entirely ruled out, which became clear on 23 September.

The risk of power shortages in Sweden's electricity system diminished when Svenska Kraftnät procured, as a transitional measure, a power reserve under the limited-duration act governing power reserves.

Our dependence on the outside world is increasing through the electricity markets becoming internationalised. Sweden's electricity market is becoming increasingly dependent on the availability of both hydropower and thermal power in other countries. International transmission capacity requirements are also increasing. Additionally, methods for achieving the payment of transit power have begun to be developed and applied. The internationalisation of the electricity markets is increasing the level of complexity for Svenska Kraftnät, as well as the demands placed on it. At the same time, an enlarged electricity market will lead to the improved utilization of resources.

The model for transit compensation being applied within ETSO, which Svenska Kraftnät joined in january 2004, will affect the financial result. In the event of

large flows through Sweden, Svenska Kraftnät will earn revenues. However, at the same time, this will be giving rise to flows through Denmark and adjacent countries, and thus incurring costs for Svenska Kraftnät. Using the model that ETSO currently applies, a net cost will normally arise for grid companies like Svenska Kraftnät with low grid fees. This means increased costs for Svenska Kraftnät during 2004.

Group summary for 2003

Turnover in the Svenska Kraftnät Group rose by MSEK 141, or 3.7%, from MSEK 3,841 to MSEK 3,982.

The Group's network revenue fell by MSEK 115, amounting to MSEK 2,215. System revenue rose by MSEK 264 to MSEK 1,416 while revenue from the telecom operation fell by MSEK 6 to MSEK 64.

Operating expenses for the Group amounted to MSEK 3,593 (3,224). This increase is primarily due to increased costs regarding the purchasing of power, balance power and system operation services.

Payroll expenses amounted to MSEK 178 (172).

Other operating expenses for the Group rose by MSEK 348 compared with 2002. Costs for energy losses during transmission via the grid rose by MSEK 108, due to a higher electricity price during the year. Balance power costs, i.e. purchased balance power, rose by MSEK 213, which is also due to the higher price of electricity. Costs for system operation services rose by MSEK 78 due to the higher price of hydropower for primary regulation.

Group depreciation for the year on intangible and tangible fixed assets rose by MSEK 15 to MSEK 527.

Share of income in associated companies amounted to MSEK 19, which is MSEK 21 down on 2002. Nord Pool ASA is responsible for the greater part of this result. Depreciation of goodwill is included at just over MSEK 3 (3).

The operating income for the Group is MSEK 408, which is down by MSEK 249 on 2002.

Net financing for the Group amounted to MSEK –118, MSEK 9 down on last year. This is primarily due to the disposal of shares in associated companies EL-EX Sähköpörssi Oy and Nord Pool Spot AS during 2002, which yielded a capital gain of MSEK 21 and was included in the financial revenues. Group financial revenues amounted to MSEK 13 (20) for 2003. The fall was due to lower interest rate levels. Financial expenses amounted to MSEK 125 (148), as a consequence of the lower cost of financing loans in SwePol Link AB than during 2002.

The net income for the year, MSEK 288 (541), entails an earning capacity of 3.5 (6.6)% on adjusted equity. The debt-equity ratio was 0.49 (0.50), which falls short of the goal of at least 0.55.

Reporting by business segment

The results of the business operation concerning transmissions via the grid, the system responsibility, the telecom operation, the power contingency operation and renewable electricity certificates are accounted for and commented upon here.

From 2002, Svenska Kraftnät's income statement is divided up into system responsibility and network. It is not, however, self-evident how this division of costs into a network section and a system section should be carried out. The account is rendered after an assessment of how the costs should appropriately be distributed between each respective business sector. In some cases, an activity has not been entirely attributable to one single business sector. In such cases, the cost has been distributed as a standard item.

Network encompasses operations and expenses relating to:

- the grid
- cross-border interconnectors with the other Nordic countries
- network operation incl. control centres
- part of the disruption reserve
- counter-trading
- electricity procurement to cover network losses.

System responsibility includes operations and expenses relating to:

- primary and secondary regulation
- part of the disruption reserve
- balance power settlement
- balance power
- Ediel, the electronic "postal service".

As a special part of the system responsibility, measures for safeguarding the supply of power to the electricity system are included for a limited period (procured peak-power reserve).

Network

The grid tariff consists of a capacity part and a usage part. The capacity fee is based on power annually subscribed to by the customer for entry and exit power at each connection point. The fee varies geographically across the country in a way which will reflect the average costs for the grid. For 2003, the fee for entry power was SEK 5.00/kW in the south and SEK 25.00/kW in the north. For exit power, the relationship was, in principle, the reverse. The exit power fee was SEK 47.00/kW in the south and SEK 11.00/kW in the north.

Grid fees account for the bulk of transmission revenues. Other revenue items are constraint and transit revenues. Constraint revenues arise when the Nordic market has been divided up into separate price sectors. Transit revenues are made up of compensation for loss expenses caused by power flows generated externally and travelling via the Swedish grid. A previously large revenue item, the one for utilizing the cross-border interconnectors, has disappeared following the removal of the last cross-border tariff towards Denmark.

Revenue from transmission

During the year, transmissions on the grid amounted to 115.2 (122.5) TWh. Network fees brought in MSEK 1,622 (1,741). Of these, the capacity fee accounted for 69 (62) % and the usage fee for 31 (38) %. The reason for the relationship changing is transmission levels during 2003 being less than those of 2002.

The table below shows transmission revenue.

Transmission revenue, MSEK

	2003	2002
Grid		
Capacity fees	1,113	1,083
Usage fees	509	658
Total	**1,622**	**1,741**
Overseas interconnectors	0	20
Constraint revenue	163	183
Transit revenue (gross)	74	35
Misc. transmission revenue	43	39
Total	**1,902**	**2,018**
No. of customers connected to grid	**30**	**29**

Transmission via the grid and energy losses

Entry and exit accounts are up on 2002. The transmitted energy, on the other hand, has fallen. This is due to a reduced supply of hydropower in northern Sweden.

Power transmission	2003	2002
Subscribed power, grid		
Entry accounts. MW	20,864	20,003
Exit accounts. MW	21,330	21,096
Entry energy, grid, TWh	117.7	125.2
Exit energy, grid, TWh	115.2	122.5
Max exit power, grid, GWh/h	19.5	19.5

As a consequence of the reduced level of transmission, transmission losses on the grid have fallen slightly, as shown in the table below.

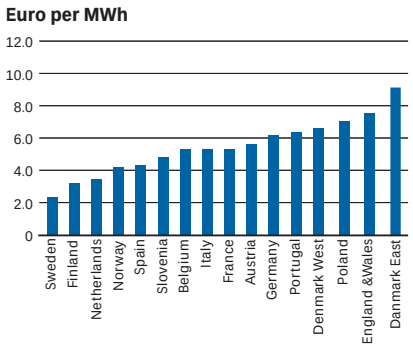
Grid	2003	2002
Energy losses, TWh	2.5	2.7
Percentage of exit energy, %	2.1	2.2
Max power losses MWh/h (hour of max. energy loss)	731	678

Transmission fees

A compehensive goal for Svenska Kraftnät is to have the lowest possible costs while retaining the same level of reliability, thus passing on low fees to our customers.

During 2003, ETSO, the European grid operators' organisation, made another comparison of the grid tariffs of the member countries for representative transmissions. As can be seen in the diagram below, the Swedish fee is low.

The operating result for the Network business division amounted to MSEK 486 (770).



A comparison of the grid tariffs (typical cases) of a number of European countries during 2003. This has been complied by the European grid operators' organisation ETSO (European Transmission System Operators).

System responsibility

The System Responsibility business division includes the balance service, Ediel and, transitionally, the power reserve.

The focal point of the system responsibility consists of managing the national balance between the production and consumption of electricity. This is achieved via Svenska Kraftnät's Balance Service which is staffed around the clock. During 2003, Svenska Kraftnät had agreements with 33 Swedish companies regarding balance. These companies are responsible for the balance 24 hours a day. They have to plan toward achieving a state of balance between entry power (production and trading) and exit power (consumption).

Subsequently, Svenska Kraftnät carries out balance settlement, i.e. financial settlement of the imbalances. The difference between purchased and sold balance power, i.e. the net revenue from the balance service, amounted to MSEK 105 (73).

To the System Responsibility business division are ascribed the costs for reserves, which automatically regulate production to maintain the correct frequency on the network (primary regulation).

The agreement governing balance responsibility was revised during 2003. The fee system has been modified, with the aim of reducing the balance service's previous under-financing and to implement the limited-duration act which was introduced on 1 July 2003. According to this act, Svenska Kraftnät is responsible for a peak-power reserve being available consisting of a maximum of 2,000 MW. In the new fee structure, which came into force in November 2003, a supplementary fee for financing the peak-power reserve, among other things, has been introduced.

The power reserve has generated revenues, primarily during January 2003, as a consequence of plants being operated for the owners' use. The revenues will accrue to the balance responsible companies in accordance with the transitional solution agreed with the industry, which was in force between January 2001 and March 2003. The net income for the peak-power reserve amounted to MSEK 49 (4). Over time, this operation will be neutral for Svenska Kraftnät, with regard to results.

Svenska Kraftnät has 33 balance providers. During the year, there was an enquiry, together with representatives of the players, into whether or not the rules of the balance agreement could be modified in order to promote competition on the electricity market. As a consequence, the terms and conditions of the consumption balance were changed to make it less financially palpable for players to have small imbalances. This was achieved through the introduction of a deviation margin.

The players on the electricity market have agreements with Svenska Kraftnät regarding Ediel communication. Net revenues for Ediel amounted to MSEK –3 (–8). In order that the players themselves may be able to test different scenarios of Ediel messages, Svenska Kraftnät has introduced a web-based system, the Ediel Portal. This tests whether or not accepted standards are being met. The prerequisites for exchanging information between the players, e.g. for changing supplier, will thus be improved. The Ediel Portal will go into service during the first quarter of 2004.

The operating result for the System Responsibility business division was MSEK –124 (–179).

Operations exposed to competition

The companies exposed to competition in the Group are; Nord Pool ASA, Nord Pool Spot AS, Nord Pool Consulting AS and Kraftdragarna AB. These are associated companies and their accounts use the percentage of capital method. Shares of earnings during 2003 amounted to MSEK 19, compared with MSEK 40 for 2002. The Nord Pool companies account for almost the entire share of earnings. The reduction is primarily due to lower volumes on Nord Pool's financial market. This in turn is due to the high guarantee costs resulting from high prices and great volatility during 2003.

Telecom and optical fibre operation

The telecom network's ongoing technology-upgrade means that links are being moved from the older carrier frequency and radio link networks to the opto-based SDH network, which has now reached one hundred or so of a total of 135 power and transformer stations on the power grid. This means that, even today, the bulk of Svenska Kraftnät's operational telecom traffic goes via the opto network.

The most recent major expansions of the optical network have been implemented in central and upper Norrland. A new link has been built by Svenska Kraftnät from the Östersund area up to Porjus by the Luleälven river. By means of an agreement with another telecom operator, a link has also been established from Porjus down to Sundsvall via Luleå. In this way, a loop has been set up. A number of grid stations will be connected to them.

The public telecom network in the interior of Norrland has been expanded relatively little on the national level. The National Post and Telecom Agency has thus contributed to the financing of a further connection through upper Norrland from the Luleälven river to the Ångermanälven river.

Through collaboration with the municipalities of Västerbotten, Svenska Kraftnät has gained access to regional opto fibres, providing opportunities to connect the loop together through upper Norrland in the middle. In this way, more stations can be connected to the opto network. Additionally, the optical network's operational reliability will be improved by means of the loops becoming smaller.

The commercial optical operation's revenue amounted to MSEK 50 (51). The operating income was MSEK 23, down by MSEK 6 on last year. This is primarily due to depreciation for the year rising by MSEK 4 as a consequence of additional investments during recent years. Investments for the year amounted to MSEK 47 (85).

With interest calculated for costing purposes at 7% of employed capital, the net income for the year is MSEK –3 (3). Interest calculated for costing purposes is based on the business division's assessed overall risk.

Over and above revenue from external customers on the optical network, Svenska Kraftnät, within the Telecom business division, had revenue of MSEK 14 (19) for the data network, the telephone network and the leasing of antenna sites.

Telecom's overall operating revenue are MSEK 96 (94). These include MSEK 32 (24) for intra-Group services for the Network business division. The operating income was MSEK 27 (26).

Contingency planning

The contingency planning, consisting of power contingency and dam safety, is financed via subsidies. The activity is thus neutral with regard to Svenska Kraftnät's results. The available funds for the year of MSEK 267 have largely been utilized.

Svenska Kraftnät's expenses for its own contingency measures at grid installations are financed using its own funds.

Government grant

The table at the bottom of the page shows the allocated and utilized sums per subsidy-item (kSEK).

The brought forward frame relates to unutilized funds from the previous budget year.

Over and above this, subsidy financed contributions have been received from the emergency preparedness authority at a sum of kSEK 16,766.

The dividend paid in is reported against a revenue heading, linked to the national budget, in accordance with the table below (kSEK).

Revenue heading, kSEK	Sum to deliver	Delivered sum
2116 Parent entity's delivered dividend	356,000	356,000

Renewable electricity certificates

On 1 May 2003, a system of renewable electricity certificates was introduced in order to promote renewable electricity production in Sweden. The law provides producers of renewable electricity with the opportunity to obtain, from the government, a certificate for each MWh of electricity produced. The certificates can be sold to electricity suppliers/consumers. These are obligated to purchase renewable electricity certificates equivalent to a certain part of their sales/consumption.

Svenska Kraftnät is responsible for issuing and managing the renewable electricity certificates. Other supervisory tasks are the responsibility of the Swedish National Energy Administration.

Svenska Kraftnät has issued just over 5 million certificates for 2003. Since the system was introduced, approx. 4.6 million renewable electricity certificates have been turned over at an average price of approximately SEK 200/certificate (one certificate = 1 MWh). Biofuel fired electricity production accounts for just under 75% of the issued certificates, hydropower for just over 17% and wind power for approx. 8%.

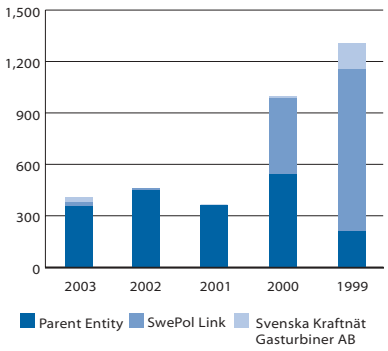
Svenska Kraftnät's revenues from this segment are MSEK 2 and the operating income is MSEK 0.

Investments

The Svenska Kraftnät Group's investments for the year amounted to MSEK 411 (460), see the diagram below and the table above right.

The investments can be broken down as follows (MSEK):

Investments (MSEK)



	2003	2002
Parent entity:		
Network investments	293	235
Opto links	47	85
Intangible assets	18	8
Shares – in Nord Pool ASA (new issue)	–	118
Subtotal for parent entity	**358**	**446**
SwePol Link AB	**20**	**13**
Svenska Kraftnät Gasturbiner AB	**33**	**1**
Total	**411**	**460**

The largest investment of MSEK 70 relates to the ongoing rebuild of station sections belonging to the DC link between the west coast of Sweden and Jutland. The completion of a new substation at Hemsjö, in Blekinge, amounts to MSEK 40. The rebuild of the line between Hallsberg and Moholm accounts for MSEK 36, and the line between Krångede and Horndal for MSEK 21.

Financing and liquidity

Parent entity Svenska Kraftnät finances its operations using equity and loans from the National Debt Office. At the end of 2003, borrowing amounted to MSEK 665 (499) and liquid funds to MSEK 12 (51). Svenska Kraftnät's cheque account with the National Debt Office can be used up to a limit of MSEK 1,500.

SwePol Link AB has signed an agreement with Vattenfall AB regarding a loan of up to MSEK 2,750. The intention is that this loan will be replaced by loans on the financial market and, if required, to a smaller extent using co-owner loans. Svenska Kraftnät has been authorized by the government to issue co-owner loans of up to MSEK 500 to SwePol Link AB. The government has additionally authorized the National Debt Office to issue a guarantee of up to MSEK 1,000 for loans which SwePol Link AB needs to take out on the financial market.

Borrowing by Svenska Kraftnät Gasturbiner AB fell during the year from MSEK 190 to MSEK 182. The bulk of this financing has previously been carried out on the open financial market, but now takes place within the Group.

Liquid funds in the Group amounted to 99 MSEK (165).

Environment

Svenska Kraftnät must work towards solutions that are sustainable in the long-term and which contribute to the national environmental quality goals being achieved. Our environmental work primarily focuses on measures for limiting the climatic impact of our operations, reducing the use of environmentally-destructive substances and limiting the impact that lines and stations have on people's living environments and surroundings. Svenska Kraftnät's efforts include benefiting the biological multiplicity found in the power line right of ways.

One goal is that transmissions on the grid will entail as few energy losses as possible. Svenska Kraftnät has been developing, during recent years, methods of reducing losses due to the corona effect, i.e. discharges into the air from power lines. From 2003, measures are routinely being carried out from control rooms to reduce corona losses. In doing so, these can be reduced by about 10%.

Grant accounts for parent entity

Political area Total defence kSEK	Opening amount	Discontinuation in accordance with 3% rule	Amount assigned for year according to official document	Reallocation according to government decision	Deducted expenses	Closing amount
6: 5 Civil defence						
Subitem 1:2 – Power contingency measures	3,777	–	250,000	–	–250,670	3,107
6: 21 Total defence						
Subitem 1:2 – Parent entity Svenska Kraftnät	4,222	4,002	–	220	–	–
Total government grant	7,999	4,002	250,000	220	250,670	3,107

Emissions of the greenhouse gas sulphur hexafluoride (SF_6) from equipment at Svenska Kraftnät's switchyards have been further reduced during the year by replacing components. In doing so, gas chambers at switchyards and breakers have become tighter. Emissions have now been reduced to just over 0.1% per annum of the installed volume of SF_6 gas. Some examples of other environmental improvements made at our installations are the replacement of refrigerating machines containing CFCs and the phasing out of components containing quicksilver.

Power lines and stations must have as little effect on their surroundings as. A lot of consideration is paid to environmental factors like exposure to electrical and magnetic fields and the impact on the countryside. Several enquiries and measures have been conducted during the year in order to solve problems with magnetic fields close to existing power lines. In the ongoing project to build a new 400 kV line between Stenkullen and Lindome in the Gothenburg area, great efforts are being made to find the best solutions from the environmental point of view. The project has chosen to prioritize people's living environments over other environmental interests, in cases when different interests need to be weighed against each other.

Management of the power lanes can be adapted so that the biological multiplicity benefits. During 2003, a number of subcontractors have been trained in a method of locating places of great natural value and suggesting management measures for them. The trials that the Swedish University of Agricultural Sciences is conducting for Svenska Kraftnät regarding the adapted management of sample plots in power line right of ways continued during 2003.

Among the other measure taken, we can mention the continued development of new designs for reducing the impact on their surroundings made by power lines and a comparative study of methods for taking samples of PCB in transformer oil. Svenska Kraftnät also gives financial support to research into electric and magnetic fields via Elforsk AB.

Svenska Kraftnät's environmental policy emphasizes the importance of its employees being environmentally aware, that clear goals and routines exist as regards environmental work and that consideration for the environment permeates decisions made. During 2003, Svenska Kraftnät worked on the development and improvement of the structure and routines of its environmental management system. Efforts are primarily focused on installation operations. Our system will comply with the environmental management standard ISO 14001, but no certification is planned.

Customer contacts

During 2003, we conducted a survey into what our customers and players think about us. Twenty or so people in leading positions were interviewed.

Svenska Kraftnät's image was positive throughout the survey. Among other points of view, it can be mentioned that Svenska Kraftnät is perceived to be the engine of the Swedish electricity market. Our employees are regarded as professional, business-like and competent. More perceptivity, however, was requested, as was a clearer picture of how Svenska Kraftnät would like the electricity market to develop.

The results of the survey have been followed up and discussed by the Svenska Kraftnät advisory committees. This way, we have obtained valuable points of view regarding how we can further improve our work and prioritize issues that are of central importance to our customers. As regards the development of the electricity market, Svenska Kraftnät's focus is on contributing towards a commercial solution to the peak-power issue, managing transmission limitations and continuing the work of harmonising the system of rules on the international electricity market.

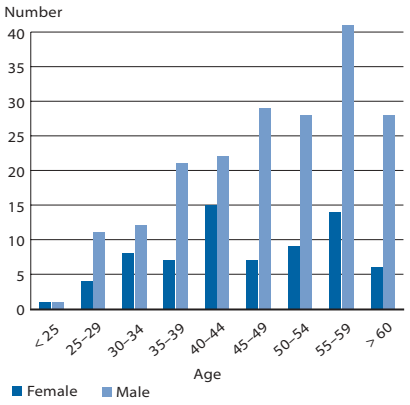
Svenska Kraftnät is also actively contributing to the work of improving the routines and information structure of the electricity market. The objective is to obtain a more efficient electricity market by increasing the clarity of the rules and the expertise of the players. This collaboration has resulted in the industry standard The Swedish Electricity Market Manual being disseminated through extensive training efforts.

Employees

The number of full-time employees at year-end was 264 (257), of whom 193 (190) were men and 71 (67) women. The percentage of female managers is 25%, which largely corresponds to the total percentage of women, i.e. 27%. Staff turnover was 2.3 (2.5)%. The total sick absence as a percentage of the number of ordinary working hours during 2003 was 3.3 (3.7)%.

The average age at the company is 47 (47). A breakdown by age and gender can be seen in the table.

Within a period of five years, 35 employees will leave Svenska Kraftnät through retirement. During the years that follow, retirements will increase even more.



Fulfilment of objectives 2003

Svenska Kraftnät wishes to be an attractive employer. The most important activities for achieving this over-arching goal are:

- Interesting work.
- Good leadership.
- Good and safe working environment.
- Planned expertise development.
- Common values and attitudes.
- Active equal opportunities work.
- Good workplace for parents of small children.
- Recruitment of younger employees.
- Internal mobility.

During 2003, a survey was conducted among our employees which showed a high degree of staff satisfaction at Svenska Kraftnät. Results within all sub-areas were better than the average at a large number of companies in the survey company's database.

The targets for sick absence (less than 4%) and staff turnover (less than 4%) have been met, as has the target of increasing the number of female managers (2).

During 2003, 14 employees have been recruited, of whom 5 are female and 9 male. The average age of these new employees is 37. The target of increasing the age range has thus partially been met.

One of our other targets is encouraging internal mobility. During the year, 7 employees have changed unit or department within the company.

The target of implementing, during the year, an accurate expertise analysis with rectifying measures has been met, as has the creation of a programme of expertise exchange between old and young employees.

For a number of years, Svenska Kraftnät has been offering its managers an advanced leadership programme. A group of 5 managers took part in this programme during 2003.

Targets and focus for 2004

The ability of the workplace to change and develop is of great significance to how Svenska Kraftnät fulfils its mission – both now and in the future.

For our employees, it is crucial to develop their expertise in line with the evolution of the company. Expertise development also has to aim at a future supply of leaders and the development of specialists, as well as other changes requiring special endeavours, e.g. the effect of high retirement numbers.

The supply of expertise will lead to Svenska Kraftnät maintaining its prominent role in this business sphere. A prerequisite of this development is good leadership, which through the participation of our employees, will clearly distribute the responsibility for our operations, results and expertise development.

A further group of managers will be embarking upon Svenska Kraftnät's leadership programme during 2004.

Our targets for 2004 are as follows:

- Employees must see Svenska Kraftnät as a very attractive employer.
- The age range must be increased via the recruitment of younger employees.
- The proportion of females and female managers must increase to 30%.
- Staff turnover must continue to be on a low level.
- Health related absence must be reduced to 3%.
- Each employee at Svenska Kraftnät must have a documented development plan based on a thorough expertise analysis.
- Svenska Kraftnät must actively work for planned expertise exchanges between older and younger employees.
- Svenska Kraftnät must be seen as a very good employer of parents with children.

Health related absence

Health related absence was 3.7% during the first half of the year and 2.9% during the second, totalling 3.3 (3.7)%. The health related absence for males is 3.1%, and for females 3.6%. The proportion of long-term health related absence in excess of 60 days was 1.9%. Health related absence is calculated in such a way that the number of hours on sick leave is divided by the total number of ordinary working hours. Of our employees, 54% never had a single day's sick absence during the year. Health related absence for the age group up to 29 is 6.7%, for the age group between 30 and 49 it is 2.2% while for the age group over 50 it is 3.8%.

Svenska Kraftnät conducted a health survey including medical tests for all its employees during 2002, with a follow-up during 2003. The follow-up shows that employees in all areas had improved their physical and mental health from a level which, even during 2002, was completely satisfactory. Of the total number of employees, 85% feel good or very good.

Svenska Kraftnät offers a number of opportunities to our employees, individually or in groups, in order to improve their health and fitness.

The supply of expertise 2005/2006

The possibilities of recruiting competent employees have improved during recent years for labour market reasons. Nevertheless, a certain amount of concern is justified as the number of places at universities offering education in the areas of expertise of significance to Svenska Kraftnät's operations is relatively limited.

Bearing in mind Svenska Kraftnät's age profile, it becomes necessary to employ measures that will enable us to avoid shortages of expertise and labour in the future. Additionally, the proportion of females and female managers should be increased at Svenska Kraftnät, primarily in the technology-oriented departments.

Our focus during 2005/2006 will be:

- Expertise analyses and personal development plans for all employees.
- Programmes and activities for transferring and exchanging expertise between older and younger employees.
- Active recruitment of young graduate and female employees and managers.
- Improved university liaison.
- Reduction of sick leave to less than 3%.

Incentive programme

The purpose of Svenska Kraftnät's incentive programme is to create commitment in order to achieve a good level of reliability, good financial results and a high level of cost-effectiveness. In doing so, Svenska Kraftnät's primary targets can be met: an operationally reliable and efficient grid.

The programme includes all employees except the Director General, whose financial terms and conditions are set by the government.

The incentive programme is set up in such a way that the maximum outcome is one month's wage. Target fulfilment for 2003 was lower than during previous years, partly due to the outage on 23rd of September and partly due to the poorer financial results.

The cost-effectiveness target, on the other hand, has been achieved in full. Altogether, this means an outcome of 40% of one month's wages, which will be paid out in May 2004. Turnover for 2003 is MSEK 5.7, including social security contributions.

The Board

The Board of Svenska Kraftnät consists of nine members, including two staff representatives. During the year, the Board met five times. An evaluation of the work of the Board has been conducted.

The work of the Board has primarily focused on:

- the financial efficiency of operations
- major investments and agreements
- the Nordic and European electricity markets
- the power issue
- the outage of 23 September
- the trend on the power exchange
- customer and employees surveys
- the supply of expertise.

The Board visited Helsinki for talks with the Board of Fingrid Oyj.

Income Statements

MSEK	Note	Group 2003	Group 2002	Parent entity 2003	Parent entity 2002
Operating revenue					
Network revenue	1	2,215	2,330	1,902	2,018
System responsibility revenue	2	1,416	1,152	1,419	1,152
Telecom revenue		64	70	64	70
Renewable electricity certificates		2	–	2	–
Government grant for power contingency planning	3	267	275	267	275
Capitalized work for own account	4	18	14	18	14
Total operating revenue		**3,982**	**3,841**	**3,672**	**3,529**
Operating expenses					
Payroll expenses	5	–178	–172	–177	–169
Other operating expenses	6	–2,888	–2,540	–2,827	–2,508
Depreciation of intangible and tangible fixed assets	12, 13	–527	–512	–390	–376
Total operating expenses		**–3,593**	**–3,224**	**–3,394**	**–3,053**
Share of income in associated companies	11	19	40	–	–
Operating income	7	**408**	**657**	**278**	**476**
Income from financial investments					
Financial revenue	8	13	41	30	35
Financial expense	9	–125	–148	–31	–24
Translation gains/losses on consolidation		–6	–2	–	–
Income after financial items		**290**	**548**	**277**	**487**
Tax on income for the year	10	1	–5	–	–
Minority shares		–3	–2	–	–
Net income for the year		**288**	**541**	**277**	**487**

Comments on the income statements

Operating revenue and expenses

Group operating revenue rose by MSEK 141, or 3.7%, amounting to MSEK 3,982 (3,841).

Group network revenue fell by MSEK 115 on last year. During the year, transmission revenue on the grid fell by MSEK 119; due to changed transmission patterns. Revenue from the overseas interconnectors fell by MSEK 20, following the complete removal of cross-border tariffs on 1 March 2002. Revenue from capacity fees fell by MSEK 20, because price sectors occurred to a lesser extent than during last year.

System responsibility revenue rose by MSEK 264, which can be explained by more balance power being sold. The telecom operation's revenue fell by MSEK 6, due to lower prices during 2003. Government grant for the power contingency operation have been provided with funds of MSEK 267, corresponding to the cost of running the contingency operation. New business division Renewable Electricity Certificates earned revenues of MSEK 2.

The Group's operating expenses amounted to MSEK 3,593 (3,224).

Payroll expenses rose by MSEK 6.

The Group's other operating expenses rose by MSEK 348. The cost of energy losses during transmissions on the grid rose by MSEK 108. During the year, the entire volume was purchased via long-term contracts. The cost of balance power for the year rose, exceeding last year's cost by MSEK 213, as a result of the higher electricity prices. Following a government decision, Svenska Kraftnät purchased power supplements of approximately 500 MW during the winter of 2002/2003, costing MSEK 15.

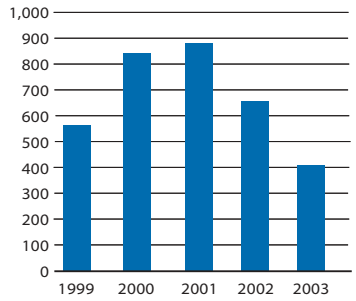
Depreciation of intangible and tangible fixed assets amounted to MSEK 527 (512).

Operating income

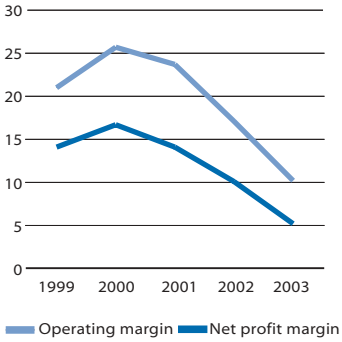
The Group operating income fell by MSEK 249 to MSEK 408. The operating income consists of the day-to-day running of the Group's various business segments plus income from shares in associated companies. The operating income includes the Group's depreciation.

The dominant activity of Svenska Kraftnät's operations is Network, whose operating income amounted to MSEK 486 (770). Several items concern both the Network operation and the System

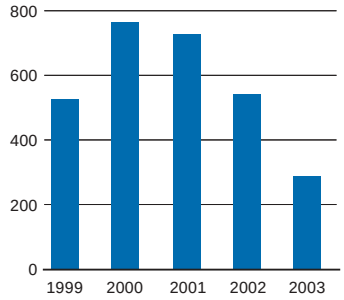
Operating income (MSEK)



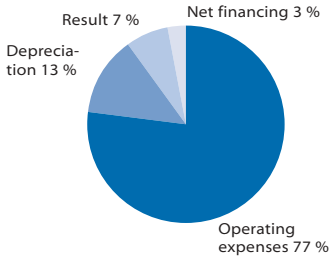
Operating and net profit margin (%)



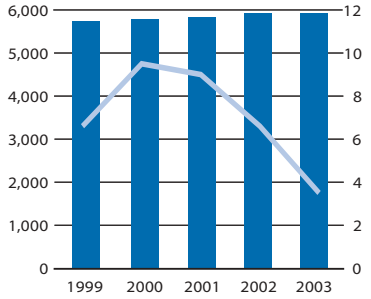
Net income for the year (MSEK)



Cost distribution for 2003



Adjusted equity (MSEK) **Return on adjusted equity (%)**



responsibility. These activities have not been able to be entirely assigned to one business division and then the expenses have been distributed in a standardized way.

The System responsibility activity produced a deficit during 2003 of MSEK –124 (–179). This included expenses for an additional peak-power reserve amounting to MSEK 15 (54). Revenue from sold balance power rose by MSEK 279, while costs for purchased balance power rose by MSEK 213.

The telecom operation's contribution to the operating income was MSEK 27, compared with MSEK 26 last year, which can be explained by increased internal revenues.

Companies exposed to competition within the Group are Nord Pool ASA, Nord Pool Spot AS, Nord Pool Consulting AS and Kraftdragarna AB. As all of these are associated companies, only Svenska Kraftnät's share of the earnings in each respective company is included in Group result. Shares of income amounted to MSEK 19, compared with MSEK 40 for last year. Nord Pool ASA and Nord Pool Spot AS account for the bulk of this.

The operating margin for the Group amounted to 10.2%, which is 6.9 percentage points lower than last year.

Net financing

Net financing amounted to MSEK –118 (–109). This is MSEK 9 down on last year, which is attributable to a gain of MSEK 21 when selling shares in EL-EX Sähköpörssi Oy and Nord Pool Spot AS last year. Group interest income fell by MSEK 3 to 13 MSEK as a consequence of the lower interest level on the financial market. Financial expenses amounted to MSEK 125, thus falling by MSEK 23. Most of this relates to the cost of financing loans in the SwePol Link, which were down MSEK 25 on last year. The parent entity was hit by an exchange rate loss of MSEK 9 on loans to Nord Pool ASA.

The interest cover ratio was 3.3 (4.6).

Net income for the year

Net income for the year was MSEK 288, which is MSEK 253 down on 2002. This result entails a return of 3.5 (6.6)% on adjusted equity. The net profit margin with deductions for standard taxation was 5.2%, which is a fall of 4.9 percentage points compared with 2002.

Balance Sheets

MSEK	Note	Group 2003-12-31	Group 2002-12-31	Parent entity 2003-12-31	Parent entity 2002-12-31
ASSETS					
Fixed assets					
Intangible fixed assets	12				
Balanced expenses for computer programs		14	9	14	9
Land rights		73	76	73	76
Usufruct		33	25	33	25
Constructions in progress		12	–	12	–
Total intangible fixed assets		**132**	**110**	**132**	**110**
Tangible fixed assets	13				
Buildings and land		598	616	196	196
Machinery and equipment		8,159	8,194	6,254	6,219
Constructions in progress		324	430	289	387
Total tangible fixed assets		**9,081**	**9,240**	**6,739**	**6,802**
Financial fixed assets					
Shares and participations in Group companies	14	–	–	12	12
Receivables from Group companies		–	–	182	–
Shares and participations in associated companies	15	300	300	177	179
Tax claim		8	7	–	–
Receivables with associated companies		54	63	54	63
Long-term receivables		2	2	3	2
Total financial fixed assets		**364**	**372**	**428**	**256**
Total fixed assets		**9,577**	**9,722**	**7,299**	**7,168**
Current assets					
Inventories etc					
Inventories		**71**	**59**	–	–
Current receivables					
Accounts receivable		281	383	272	348
Receivables from Group companies		–	–	28	8
Receivables from associated companies		5	5	5	5
Other receivables		86	75	76	57
Receivable from Government cheque account	16	49	88	49	88
Prepaid expenses and accrued income	17	256	284	233	283
Total current receivables		**677**	**835**	**663**	**789**
Cash and bank balances		**99**	**165**	**12**	**51**
Total current assets		**847**	**1,059**	**675**	**840**
Total assets		**10,424**	**10,781**	**7,974**	**8,008**

	Note	Group 2003-12-31	Group 2002-12-31	Parent entity 2003-12-31	Parent entity 2002-12-31
EQUITY AND LIABILITIES					
Equity					
Restricted equity					
Government capital		600	600	600	600
Restricted reserves		3,454	3,435	3,314	3,314
Total restricted equity		**4,054**	**4,035**	**3,914**	**3,914**
Unrestricted equity					
Unrestricted reserves		2,291	2,125	2,283	2,152
Net income for the year		288	541	277	487
Total unrestricted equity		**2,579**	**2,666**	**2,560**	**2,639**
Total equity		**6,633**	**6,701**	**6,474**	**6,553**
Minority interests		**31**	**28**	**–**	**–**
Deferred tax liability		**6**	**3**	**–**	**–**
Interest-bearing provision					
Allocated to pensions	18	**195**	**190**	**195**	**190**
Interest-bearing long-term liabilities	19	**2,667**	**2,813**	**665**	**499**
Non interest-bearing long-term liabilities					
Advances from customers		104	98	104	98
Other long-term liabilities		2	3	2	3
Non interest-bearing long-term liabilities		**106**	**101**	**106**	**101**
Interest-bearing current liabilities	20	**127**	**138**	**0**	**0**
Non interest-bearing current liabilities					
Accounts payable		391	512	308	391
Liabilities to Group companies		–	–	1	20
Other liabilities		50	48	37	15
Accrued expenses and prepaid income	21	218	247	188	239
Total non interest-bearing long-term liabilities		**659**	**807**	**534**	**665**
Total equity and liabilities		**10,424**	**10,781**	**7,974**	**8,008**
Pledged assets, etc		**None**	**None**	**None**	**None**
Contingent liabilities	22, 23	**20**	**20**	**20**	**20**

Comments on the balance sheets

Balance sheet total

The balance sheet total for the Group was MSEK 10,424 (10,781), down by MSEK 357.

Fixed assets

Svenska Kraftnät's intangible fixed assets consist of land rights, utilization rights for fibre-optic links, and balanced expenses for computer programs. The value of these is MSEK 132 (110). The increase is due to investments of MSEK 10 in utilization rights for fibre-optic links plus investments of MSEK 18 in computer programs.

Tangible fixed assets primarily consist of power lines, stations, buildings and land, fibre-optic links and other technical installations, plus ongoing new installations.

The value of the tangible fixed assets amounted to MSEK 9,081 (9,240), a fall of MSEK 159. Net investments during the year were lower than depreciations.

Financial fixed assets consist of shares in associated companies and long-term receivables from associated companies. Shares in associated companies amounted to MSEK 300. The share of net income in the income statement is MSEK 19, which increased the financial fixed assets. During the year, MSEK 17 in dividend was received from Nord Pool ASA. The shares in Nord Pool Consulting AS were disposed of.

Current assets

Current assets for the Group amounted to MSEK 847 (1,059). This reduction primarily relates to accounts receivable, which are MSEK 102 down due to lower electricity prices at the end of the year compared to December 2002. Liquid funds amounted to MSEK 99 at year-end, falling by MSEK 66. This decrease is primarily due to the parent entity's liquidity being low at year-end.

Equity

Equity at year-end was MSEK 6,633 (6,701), of which MSEK 2,579 (2,666) constituted unrestricted equity. During the year, MSEK 356 (474) has been distributed to the owner. Profit for the year in the Group was MSEK 288 (541).

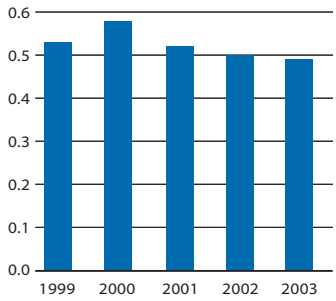
Provisions

The provision to pensions was MSEK 195 (190), i.e. an increase of MSEK 5. An instalment of MSEK 14 was paid during the year. The provision is based on an actuarial calculation by the National Government Employee Pensions Board and Svenska Kraftnät's own factual details. The provision includes selective employment tax.

Liabilities

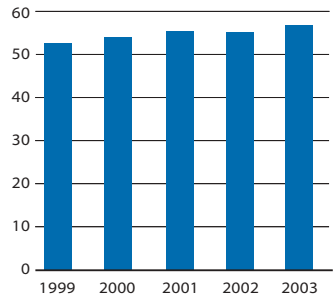
Interest-bearing long-term liabilities for the Group consist of the financing of the parent entity by the National Debt Office at MSEK 665 (499) plus external financing of the subsidiaries at MSEK 2,001 (2,314). The borrowing requirement of the Group fell during 2003 by MSEK 164. The short-term portion of this borrowing is MSEK 127 (138). The average rate of interest on loans for the Group was 4.3 (4.9)%.

Debt-equity ratio



Long-term liabilities which are non interest-bearing consist in the main of advances from customers within the opto operation and amount to MSEK 104 (98). Contract periods vary between 15 and 25 years, with the advances being booked as income during this time. The net debt liability fell by MSEK 85, amounting to MSEK 2,897. The debt-equity ratio was 0.49 (0.50).

Equity/asset ratio (%)



Changes in equity

Group	Government capital	Restricted reserves	Unrestricted reserves	Net income for year
Opening equity, January 1, 2003				
Equity brought forward as per adopted balance sheet	600	3,435	2,125	541
Allocation of profits as per government decision:				
– retained	–	–	541	–541
– dividend	–	–	–356	–
Transfer between restricted and unrestricted reserves	–	19	–19	–
Net income for year	–	–	–	288
December 31, 2003	**600**	**3,454**	**2,291**	**288**

During the financial year, the Group has not changed any of its accounting principles. The proposed appropriation of earnings in the annual report for 2002 was adopted by the government.

Parent entity				
Opening equity, January 1, 2003				
Equity brought forward as per adopted balance sheet	600	3,314	2,152	487
Allocation of profits as per government decision:				
– retained	–	–	487	–487
– dividend	–	–	–356	–
Net income for year	–	–	–	277
December 31, 2003	**600**	**3,314**	**2,283**	**277**

Cash flow statement

	Group		Parent entity	
MSEK	2003	2002	2003	2002
The year's operation				
Operating income before depreciation	916	1,129	668	852
Adjustment for items not included in cash flow	46	7	24	6
Net interest paid	–112	–145	–18	–21
Translation difference	–6	–2	–	–
Cash flow from operations before change in working capital	**844**	**989**	**674**	**837**
Increase (–)/decrease (+) in inventories etc	–12	3	–	–
Increase (–)/decrease (+) in short-term receivables	158	–120	126	–113
Increase (+)/decrease (–) in short-term liabilities	–148	181	–132	161
Cash flow from the year's operation	**842**	**1,053**	**668**	**885**
Investment activities				
Investments in intangible and tangible fixed assets	–411	–460	–358	–446
Change in long-term receivable	0	–43	–182	–39
Sale of fixed assets	2	29	2	29
Cash flow from investment activities	**–409**	**–474**	**–538**	**–456**
Financing activities				
Change in interest-bearing liabilities	–164	–152	166	–34
Advances from customers	21	–	21	–
Dividend	–356	–474	–356	–474
Cash flow from financing activities	**–499**	**–626**	**–169**	**–508**
Cash flow for the year	**–66**	**–47**	**–39**	**–79**
Liquid assets at beginning of year	165	212	51	130
Liquid assets at year-end	99	165	12	51

Comments on the cash flow statement

The purpose of the cash flow statement is to describe the Svenska Kraftnät Group's ability to generate liquid assets. It is also to constitute a supplement to the description of profitability and financial standing in the income statement and balance sheets. By liquid assets is meant cash and bank balances.

The year's operations

Cash flow from the year's operations before changes in operating assets and liabilities fell by MSEK 145 to MSEK 844. Cash flow from the year's operations amounted to MSEK 842 (1,053). This decrease is primarily due to the poorer result prior to depreciations.

Investment activities

Group investments amounted to MSEK 411 (460). Investments made in the parent entity amounted to MSEK 358, with MSEK 20 going into SwePol Link AB and MSEK 33 going into Svenska Kraftnät Gasturbiner AB. Investments were made in the parent entity during 2002 to the tune of MSEK 446 and in subsidiary SwePol Link to the tune of MSEK 14.

Financing activities

Interest-bearing liabilities in the Group fell by MSEK 164 (152). In the parent entity, interest-bearing liabilities increased by MSEK 166, while subsidiaries SwePol Link and Svenska Kraftnät Gasturbiner AB reduced their external interest-bearing liabilities by MSEK 149 and MSEK 181, respectively. Dividend has been paid out at MSEK 356 (474).

Five-year financial review

Financial key figures

The table below shows the trend for key figures over the last five years.
The comparative figures have been converted to 2003 definitions.

Group	2003	2002	2001	2000	1999
Return on adjusted equity after taxes %[3)]	3.5	6.6	8.9	9.5	6.6
Return on total capital, %	3.9	6.4	8.3	7.7	5.8
Return on capital employed, %	4.6	8.4	10.6	9.7	7.4
Equity/assets ratio, %	56.7	55.2	55.4	53.9	52.7
Operating margin, %	10.2	17.1	23.7	25.9	21.0
Capital turnover rate, %	9.4	9.0	8.7	7.5	6.4
Debt-equity ratio, multiple	0.49	0.50	0.51	0.58	0.54
Self-financing level, multiple	2.0	2.3	3.3	1.2	0.7
Interest cover ratio, multiple	3.3	4.6	5.6	11.2	8.1
Cash flow from operation before changes in working capital	844	989	1,230	1,123	904
Net liability	2,897	2,982	3,062	3,383	3,034
Investments CAPEX	411	460	363	998	1,307

3) The yield requirement concerning the earning capacity of adjusted equity was 9% in 1998 and has subsequently been 7% up until 2002. From 2003, the yield requirement is 6% and has been modified in comparison with 2002. By adjusted equity is meant the average of the restricted equity at the start of the year and at year-end plus 72% of the unrestricted equity.

Financial income etc for the five-year period

Over the last five-year period, the following statements of income have been reported, in summary, for the Group.

Summary of income statement	2003	2002	2001	2000	1999
Operating revenue	3,982	3,841	3,713	3,280	2,679
Operating expenses excl. depreciations	–3,066	–2,712	–2,377	–2,055	–1,781
Depreciation	–527	–512	–493	–404	–350
Share of income from associated companies	19	40	37	21	15
Operating income	**408**	**657**	**880**	**842**	**563**
Financial income	13	41	14	8	35
Financial expenses	–125	–148	–159	–75	–74
Translation gains/losses on consolidation	–6	–2	0	–7	7
Tax on income for year	1	–5	6	–	–
Minority share	–3	–2	–14	–5	–
Net income for year	**288**	**541**	**727**	**763**	**526**

The increased operating revenue are due to the settlement model having changed, thus providing more gross balance power. Furthermore, the settlement of final power has been added in 2001. A summary of the balance sheet for the corresponding period is as follows:

Summary of Balance sheet as at 31/12

	2003	2002	2001	2000	1999
Fixed assets	9,577	9,722	9,676	9,844	9,226
Current assets, excl. liquid funds	748	894	777	735	398
Cash and bank balances	99	165	212	139	1,404
Total assets	**10,424**	**10,781**	**10,665**	**10,718**	**11,028**
Equity	6,633	6,701	6,634	6,485	6,536
Loans[1)]	2,827	2,982	3,133	3,393	3,826
Other liabilities and pension provision	964	1,098	898	840	666
Total equity and liabilities	**10,424**	**10,781**	**10,665**	**10,718**	**11,028**

1) Including minority interests

Accounting principles

At the beginning of 2003, the Svenska Kraftnät Group consisted of parent entity Svenska Kraftnät, which is a public utility, together with three subsidiaries and seven associated companies. The subsidiaries and associated companies are joint stock companies, or the equivalent legal form in Svenska Kraftnät's overseas operations.

One of the subsidiaries, SwePol Link AB, in turn has a wholly-owned subsidiary in Poland.

System of rules

Svenska Kraftnät's accounts comply with ordinance (2000:606) governing the accounts of public authorities as well as the regulations and general advice of the Swedish National Financial Management Authority. This ordinance corresponds to the Accounting Act, but is adapted to the special circumstances applicable to government authorities and public utilities. The annual accounts have, with certain exceptions, as specified in official appropriation documents, been drawn up in accordance with ordinance (2000:605) governing annual accounts and supportive documentation and the Swedish National Financial Management Authority's regulations and general advice. Part of Svenska Kraftnät's operations – the power contingency operation – is financed via state subsidies. For this operation, subsidy ordinance (1996:1189) is also applicable, which among other things regulates the principles of subsidy settlement and how unutilized funds may be transferred from one budget year to another. Svenska Kraftnät also has to comply with the Swedish Financial Accounting Board's recommendations as well as the Financial analysts' recommendations where these are applicable to public utilities.

Svenska Kraftnät has adapted its accounts to the new accounting recommendations in ordinance (2000:606) and to the Swedish Financial Accounting Board's, which came into force on 1 January 2002. Of the new recommendations, only RR 15 Intangible assets has brought about a change in the accounting principles, entailing a considerable impact on the figures. This recommendation means that land rights, effective 2002, will be depreciated after the assessed utilization period. During previous years, land rights have not been subject to depreciation.

For the companies of the Group, the Accounting Act, the Annual Accounts Act and corresponding special legislation, primarily the Companies Act, all apply. Three of the associated companies are Norwegian. For these, the corresponding national laws will apply.

The supervisory authority for the network operation is the Swedish National Energy Authority.

Consolidated accounts

The consolidated accounts encompass Svenska Kraftnät and all its subsidiaries and associated companies, both in Sweden and abroad. The term subsidiary denotes a legal entity wherein Svenska Kraftnät holds, or has at its disposal, more than half the votes, or owns stakes in the legal entity and has the sole right to bring a major influence to bear on this by virtue of a contract or other provision. The term associated company denotes a legal entity that is not a subsidiary, but wherein Svenska Kraftnät owns stakes and wields a major influence on the legal entity's operational and financial governance.

The consolidated accounts have been drawn up in accordance with the purchase method, which briefly means that the acquisition cost of shares in the subsidiary is eliminated against the equity existing in the subsidiary at the time of acquisition. The Swedish Financial Accounting Board's recommendations in respect of consolidated financial statements are applied.

Minority participations in the net operating profit and equity of partly-owned subsidiaries are reported separately when calculating the Group's net operating profit and equity.

Internal profits and transactions within the group are eliminated in the consolidated accounts.

The associated companies are reported in accordance with the percentage of capital method. This means that the book value of shares and participations in associated companies is set, in the consolidated accounts, at the Group's stake in the associated company's equity and non-depreciated goodwill. By reason of this, Group results will include Svenska Kraftnät's stake in the associated company's result less the depreciation of goodwill and the rendered dividend. The stake is included in the restricted reserves.

Reporting foreign currency

Accounts payable and receivable in foreign currencies

Accounts payable and receivable in foreign currencies have been valued at the rate of exchange at year-end. Unrealized exchange rate gains and losses are included in the results.

Translation of foreign subsidiaries and associated companies

Subsidiary SwePol Link's Polish subsidiary's final accounts have been translated to SEK in accordance with the monetary method, which entails monetary items being converted to the rate of exchange at year-end while non-monetary items are converted to the rate of exchange at the time of investment. The conversion difference in monetary assets and liabilities is included in the results for the year and reported in the statement of income.

The monetary method is used because the Polish company's operations are regarded as an integral part of SwePol Link AB's operations.

The major currencies used in the consolidated accounts are specified in the table below.

Revenue accounting

Svenska Kraftnät's network revenue consist of both account fees and energy-dependent fees. Account fees or power fees are fixed annual fees that are recorded as revenue linearly across the period that the fee is intended to cover, while the energy-dependent fee is recorded as revenue as and when Svenska Kraftnät's services are utilized.

System revenue consist of sold power for the balance service, revenues from the utilization of the Ediel IT system and revenue for covering the cost of the peak-power reserve. Sold balance power is invoiced fortnightly. All in all, if the customer has purchased power during the period, this will be reported as a revenue for Svenska Kraftnät, but if the customer has sold power instead, this will be reported as a balance power cost.

Other operating revenue are recorded as revenue in connection with the service being provided. To a certain extent, customers can pay in advance. The advance will then be settled against revenue in step with the service being provided.

Intangible fixed assets

Intangible fixed assets consist of land rights, utilization rights, ongoing installation work and development costs for computer programs.

Effective 2002, Svenska Kraftnät depreciates land rights after the assessed utilization period, which for line concessions is most frequently 40 years. Prior to 2002, land rights were not normally written off.

Utilization rights concern opto lines and are depreciated over a period of 15-25 years

Tangible fixed assets

Tangible fixed assets, in particular consisting of machinery, plant and equipment, station and line installations, and buildings and land are recorded at the acquisition value with deductions for accumulated depreciations. Investments comprise new construction work, as well as extensions and rebuilds, which raise the standard, quality or performance in the long-term. Maintenance is regarded to be work which is required to enable the facility to be used in the originally intended way, but which does not increase its performance or manifestly extend its lifespan. Maintenance is charged to expenses using the current account method.

External contributions to investments reduce the investment's acquisition value by the corresponding amount.

Interest during the construction period has been capitalized during the construction of installations costing significant sums. Such capitalization occurred, for instance, in the case of the SwePol Link project.

Depreciation according to plan

Depreciation according to plan are calculated linearly on the assets' original acquisition values with depreciation times determined following assessment of the assets' economic and technical lifespan. The annual depreciation rates are as follows:

Lines excl marine cables and associated lines	2.5 %
Marine cables excl SwePol Link and associated lines	3.3 %
SwePol Link	5.0 %
Control facility sections of stations	6.7 %
Other station sections	3.3 %
Opto links	4.0 %
Reserve materials	6.7 %
Telecom and information systems	6.7–20.0 %
Gas turbine plants	5.0 %
PCs and machinery & equipment	33.3 %
Goodwill	10.0 %

Taxes

Svenska Kraftnät's subsidiaries are obligated to pay income tax as joint stock companies while Svenska Kraftnät is exempt from income tax. Deferred tax for differences between recorded and fiscal results is not reported by the parent entity or the Group, with the exception of SwePol Link Poland and the untaxed reserves in the Swedish subsidiaries. Deferred tax claims are reported to the extent that it is deemed probable that a sufficient taxable surplus will become available within the foreseeable future.

Inventories

The inventories have been valued at the lower of either the acquisition or market values.

Pension Commitments

The capital value of pension commitments is calculated in accordance with technical bases and recorded as an allocation. This calculation has been made based upon a recommendation by the Board for State Collective Bargaining Insurance. The interest portion of the pension costs for the year is reported under financial expenses.

Svenska Kraftnät pays a special payroll tax on pensions paid out in accordance with ordinance (1991:704) governing the setting of special payroll tax on state pension costs, and not on the basis of the allocation to pensions. As the pension liability relates to future pension payments, an allocation for special payroll tax is made based on the size of the pension liability.

Overview of the major currencies used in the consolidated accounts

		Average exchange rate		Rate on accounting date	
Country	Currency	2003	2002	2003-12-31	2002-12-31
Finland	EUR	9.1250	9.1627	9.0940	9.1925
Norway	NOK	1.1418	1.2202	1.0805	1.2595
Poland	PLZ	2.0787	2.3827	1.9400	2.3000

Notes to the Financial Statements

The sums in these notes are specified in MSEK, unless otherwise stated. Sums in brackets refer to 2002.

1 Network revenue

	Group		Parent entity	
	2003	2002	2003	2002
Capacity fee, grid	1 ,113	1,083	1,113	1,083
Energy dependent fee, grid	509	658	509	658
Usage fee, overseas	0	20	0	20
Constraint revenue	163	183	163	183
Transit revenue	74	35	74	35
Transmission to/from Poland	280	304	–	–
Other operating revenue	76	47	43	39
Total	**2,215**	**2,330**	**1,902**	**2,018**

2 System revenue

	Group		Parent entity	
	2003	2002	2003	2002
Sold balance power	1,033	754	1,036	754
Sold final power	81	120	81	120
Sold supportive power	27	85	27	85
Sold regulating power	105	41	105	41
Peak-power reserve	156	140	156	140
Ediel	14	12	14	12
Total	**1,416**	**1,152**	**1,419**	**1,152**

Sold balance power relates to invoiced revenues for the imbalance that the balance providers have caused in the national power system.

3 Government grant for contingency planning

Government grant refers to the funding used to finance the power contingency planning. The funds correspond to an equally large operating expense for the power contingency planning, thus providing the parent entity with a zero result.

The grant utilized during the year of 267 (275) have funded, among other things, contributions for maintaining gas turbines, securing the function of control centres, training civil duty conscripts, procuring reserve materials and participating in Nordic Peace.

4 Capitalized work for own account

This item relates to labour costs for Svenska Kraftnät's own staff capitalized against investment projects. Investment projects relate to ongoing construction work as well as capitalized IT development projects.

	Group		Parent entity	
	2003	2002	2003	2002
Investment in progress	12	12	12	12
Capitalized development of computer programs	6	2	6	2
Total	**18**	**14**	**18**	**14**

Capitalization being reported on the income side enables the reporting of staff costs gross.

5 Payroll expenses

The average number of fulltime employees of the Group during 2003 was 261 (249), of whom 259 (245) worked in the parent entity and 2 (2) worked in the SwePol Link Group. Effective 2003, Svenska KraftKom AB has no employees.

The gender ratio at year-end can be seen in the table below.

	Group		Parent entity	
	2003	2002	2003	2002
Female	71	67	69	66
Male	193	190	193	187
Total	**264**	**257**	**262**	**253**

Group payroll expenses amounted to 178 (172), of which wage costs amounted to 108 (105). To this must be added social security contributions of 60 (59). These include pension costs of 24 (20). The remainder relates to miscellaneous staff costs.

To the outgoing Chairman, the remuneration paid amounted to SEK 18,583, while to the incoming Chairman it amounted to SEK 58,664. The other Board members' remunerations amounted to SEK 52,160 kronor each.

As regards those Board members who are employees of Svenska Kraftnät, no remuneration was paid over and above normal wages. The Director General's salary amounted to MSEK 1.1 (1.0), while the pension cost for the year was MSEK 0.3. The acting Director General's salary amounted to MSEK 0.9 (0.8). For the Director General, pension terms and conditions are applicable in accordance with the ordinance governing the pensions of heads of state corporations.

The composition of the Board, excluding the staff representatives, can be seen in the table below.

	2003	2002
Female	4	4
Male	3	3
Total	**7**	**7**

6 Other operating expenses

	Group		Parent entity	
	2003	2002	2003	2002
Purchase of loss energy	623	515	623	515
Maintenance, operational measures and leases on installations	286	270	222	216
Transit compensation	51	27	51	27
Purchased balance power	1,159	946	1,159	946
System operation services	264	186	264	206
Peak-power reserve	107	135	107	143
Additional peak-power reserve	15	54	15	54
External control centres	0	7	0	7
Own contingency measures	8	8	8	8
Research and development	15	20	15	20
Disposal losses	8	3	8	3
Contingency costs	227	241	227	241
Other expenses	125	128	128	122
Total	**2,888**	**2,540**	**2,827**	**2,508**

The item System operation services includes costs for counter-trading implemented by the balance service at MSEK 14 (11). The item Miscellaneous includes fees paid to auditors at the following amounts.

Fees and expenses	Group		Parent entity	
	2003	2002	2003	2002
National Audit Bureau with appointed accountant	0.8	0.9	0.8	0.9
Other auditors	0.5	0.3	–	–
Auditing duties	**1.3**	**1.2**	**0.8**	**0.9**
Other assignments	0.3	–	–	–
Toyal fees and expenses	**1.6**	**1.2**	**0.8**	**0.9**

The item Auditing duties relates to scrutinizing the annual accounts and bookkeeping, as well as the stewardship of the Board and the Director General/Managing Director, as well as other duties that are incumbent upon the auditor of the parent entity/company. The item Other assignments includes consultations.

7 Business segments

	Operating revenue		Operating income	
Group	2003	2002	2003	2002
Network	2,233	2,344	486	770
System responsibility	1,416	1,152	–124	–179
Telecom	96	94	27	26
Other companies exposed to competition	–	–	19	40
Contingency planning	267	275	0	0
Renewable electricity certificates	2	–	0	–
Segment elimination	–32	–24	–	–
Total	**3,982**	**3,841**	**408**	**657**

The dominant business segments of the Group are Network and System Responsibility. The operating result includes the business segment's external revenue and costs.

The Telecom operation has provided the Network operation with services to the tune of 32 (24), which is reported as operating revenue for Telecom and as an equivalent increase in the operating expenses of the Network operation. Capitalized work for own account is included in the Network operation's revenues. With a cost of capital of 7% on employed capital, the operating result for the Telecom operation is –10 (–8). The poorer result is due to higher depreciations.

8 Financial income

	Group		Parent entity	
	2003	2002	2003	2002
National Debt Office loans	0	21	17	19
Interest income	13	16	13	12
Other financial revenue	0	4	0	4
Total	**13**	**41**	**30**	**35**

9 Financial expenses

	Group		Parent entity	
	2003	2002	2003	2002
Interest expenses, National Debt Office loan	15	20	15	20
Interest expenses, other loans	93	124	–	–
Interest expenses, pension liability	4	4	4	4
Exchange rate losses	9	–	9	–
Other financial expenses	4	–	3	–
Total	**125**	**148**	**31**	**24**

10 Tax on income for the year

	Group	
	2003	2002
Current tax	4	0
Deferred tax	–3	–5
Total	**1**	**–5**

As the bulk of the Group's income before tax is earned via the parent entity, which is exempt from income tax, the relationship between the tax cost and the reported income before tax in the Group is not reported

11 Share of income from associated companies

	Group	
	2003	2002
Nord Pool ASA	14	37
Nord Pool Spot AS	5	3
Total	**19**	**40**

The share in income from associated companies is reported after tax and includes depreciation of goodwill at MSEK 3 (3). The share in income in the other associated companies was less than MSEK 1.

12 Intangible fixed assets

Intangible fixed assets are made up of land rights in the form of easements and line rights, usufruct for fibre-optic links, and balanced expenses for computer programs.

Group and Parent entity	Balanced expenses for computer programs	Land-rights	Usufruct for opto	Construction in progress	Total
Opening acquisition value	0	165	26	9	200
Investment	1	–	10	17	28
Sales/disposal	–	–	–	–	–
Reclassifications	14	1	–	–14	1
Closing accumulate acquisition value	**15**	**166**	**36**	**12**	**229**
Depreciation brought forward	0	89	1	–	90
Sales/disposal	–	–	–	–	–
Depreciations for the year	1	4	2	–	7
Accumulated depreciation carried forward	**1**	**93**	**3**	**0**	**97**
PLANNED REMAINING VALUE CARRIED FORWARD	**14**	**73**	**33**	**12**	**132**
Depreciation, previous accounting year	0	4	1	–	5

13 Tangible fixed assets

Group	Buildings and land	Machinery and other technical installations	Construction in progress	Total
Opening acquisition value	898	15,050	430	16,378
Investment	14	49	320	383
Sales/disposal	–13	–50	0	–63
Reclassifications	12	413	–426	–1
Acquisition values carried forward	**911**	**15,462**	**324**	**16,697**
Opening depreciation	282	6,856	0	7 138
Sales/disposal	–2	–40	0	–42
Depreciation for the year	33	487	0	520
Accumulated depreciations carried forward	**313**	**7,303**	**0**	**7,616**
CLOSING PLANNED RESIDUAL VALUE	**598**	**8,159**	**324**	**9,081**
Depreciation, previous accounting year	35	472	0	507
Parent entity				
Acquisition values brought forward	420	12,800	387	13,607
Acquisitions	–	3	327	330
Sales/disposal	–2	–46	–	–48
Reclassifications	12	412	–425	–1
Closing accumulated acquisition values carried forward	**430**	**13,169**	**289**	**13,888**
Opening depreciation	224	6,581	–	6,805
Sales/disposal	–1	–38	–	–39
Depreciations for the year	11	372	–	383
Closing accumulated depreciation	**234**	**6,915**	**0**	**7,149**
CLOSING PLANNED RESIDUAL VALUE	**196**	**6,254**	**289**	**6,739**
Depreciation, previous accounting year	12	359	0	371

The item Machinery and other technical installations includes, in particular, switchyard equipment, power lines, submarine cables, control installation sections, fibre-optics and telecom and information systems. The scrapping of assets primarily arises in conjunction with the commissioning of installations following reinvestment. The rateable value of properties in the Group is MSEK 292 (288). Subsidies to the tune of 15 (9) have been received for investment in gas turbines.

14 Shares in Group companies

Company	Corporate registration number	Domicile	Shares of equity, %	No.	Nominal value	Book value
Svenska KraftKom AB	556575-7274	Stockholm	100	1	0	0
Svenska Kraftnät Gasturbiner AB	556451-0260	Stockholm	100	900	9	9
SwePol Link AB	556530-9829	Stockholm	51	306,000	3	3
Total					**12**	**12**

15 Shares in associated companies

Company	Corporate registration number	Domicile	Shares of equity, %	No.	Book value Group	Book value Parent entity
Nord Pool ASA	NO 965662952	Lysaker	50	100,000	282	172
Nord Pool Spot AS	NO 984058098	Lysaker	20	2,880	8	0
STRI AB	556314-8211	Ludvika	25	375	6	4
Kraftdragarna AB	556518-0915	Västerås	50	5,000	4	1
Elforsk AB	556455-5984	Stockholm	25	750	0	0
Triangelbolaget D4 AB	556007-9799	Stockholm	25	525	0	0
Total					**300**	**177**

The acquisition value equals the book value in the parent entity.

16 Liability/receivable on Government cheque account

The liability of 49 (88) carried forward consists of the difference between withdrawn/deposited funds from the Government's cheque account and settled charges/delivered income against the national budget in accordance with the following:

kSEK	Group and Parent entity 2003	2002
Opening balance (receivable+, liability–)	87,981	47,710
Settled against national budget: Subsidy	250,670	275,271
Income headings, dividend and small-scale energy	–356,000	–474,000
Settled against government cheque account: Subsidies withdrawn	–290,000	–235,000
Dividend paid in	356,000	474,000
Closing balance	**48,651**	**87,981**

17 Prepaid expenses and accrued income

	Group 2003	Group 2002	Parent entity 2003	Parent entity 2002
Accrued network income	173	96	155	96
Accrued income, balance service	45	127	45	127
Accrued income, power reserve	0	34	0	34
Accrued income	5	10	5	10
Maintenance	15	–	15	–
Prepaid cost, opto	5	–	5	–
Other	13	17	8	16
Total	**256**	**284**	**233**	**283**

18 Provision for pensions

During the year, the part of the pension liability concerning supplementary retirement pensions has been redeemed by Svenska Kraftnät. With effect from the beginning of the year, premiums are instead paid for this part.

	Group and Parent entity 2003	2002
Opening balance	190	168
Pensions paid	–1	–1
Annual increase	16	24
Redemption of supplementary retirement pensions	–14	–
Correction of previous pension liability	–	–5
Allocation to payroll tax	4	4
Closing balance	**195**	**190**

19 Interest-bearing long-term liabilities

	Group 2003	Group 2002	Parent entity 2003	Parent entity 2002
Liability to National Debt Office	665	499	665	499
Liability to credit institution	16	180	–	–
Loans, other external	1,986	2,134	–	–
Total	**2,667**	**2,813**	**665**	**499**

The liability to the National Debt Office relates to a rolling overdraft facility. Of the above loans, 637 (777) will fall due after five years, for the Group, as will 0 (0) for the parent entity.

20 Current liabilities, interest-bearing

	Group		Parent entity	
	2003	2002	2003	2002
Liability to credit institution	–	11	–	–
Loan, misc. external	127	127	–	–
Total	**127**	**138**	**–**	**–**

21 Accrued expenses and prepaid income

	Group		Parent entity	
	2003	2002	2003	2002
Balance service – purchased balance power	43	97	43	97
Loss-energy	60	24	60	24
Peak-power reserves/supplements	3	22	3	22
Transit compensation, net	19	14	19	14
Holiday pay, compensatory leave etc	18	22	18	22
Leases on installations, maintenance	17	20	17	18
Contingency operation	6	13	6	13
Interest expenses	4	5	4	5
Prepaid income	4	7	4	7
Other	44	23	14	17
Total	**218**	**247**	**188**	**239**

22 Contingent liabilities

A guarantee has been issued for a loan of 20 (20) to STRI AB regarding the purchase of property. Svenska Kraftnät and its subsidiaries are not party to any legal, material proceedings which, in the assessment of Svenska Kraftnät, could lead to a negative impact on results for the Group which are of a significant nature.

23 Future leasing commitments

Future contractual leasing fees fall due for payment as specified below. All rental agreements are operational leasing agreements. Sums for the parent entity also include commitments vis-à-vis subsidiary Svenska Kraftnät Gasturbiner AB.

	Group		Parent entity	
	2003	2002	2003	2002
Within one year	279	259	311	292
Later than one year but within five years	444	318	575	449
Later than five years	7	7	203	236
Total	**730**	**584**	**1,089**	**977**

Proposed disposition of earnings

The Group's unrestricted equity amounts to MSEK 2,579, of which the result for the year makes up MSEK 288. The Board proposes no appropriations to restricted equity.

Of the parent entity's unrestricted equity of MSEK 2,560, of which the result for the year makes up MSEK 277, it is proposed that MSEK 309 of the result for the year be allocated to dividend and that the deficit of MSEK –32 be retained. This is MSEK 174 more than the requirements set forth in the appropriation document.

Stockholm, Sweden 20 February 2004.

Sven Hulterström	*Chairman*
Jan Magnusson	*Director General*
Viktoria Aastrup	
Yvonne Gustafsson	*Deputy Chairman*
Sussi Kvart	
Christel Nettelvik Söderberg	
Christer Samuelsson	
Erik Bengtsson	*Staff representative*
Lisa Björkling	*Staff representative*

Audit report

The National Audit Office (NAO) has scrutinized Public utility Svenska Kraftnät's annual accounts, consolidated accounts and underlying accounts, as well as its management's stewardship, for the accounting year 2003.

The management of the authority is responsible for conducting its operations efficiently and constitutionally. Responsibility includes providing the government with a reliable report of Svenska Kraftnät's operations via its annual accounts.

It is the NAO's responsibility, in accordance with good accounting practice, to review the authority's annual accounts, consolidated accounts and underlying accounts with the aim of assessing whether or not the accounts are reliable and the books true and correct, and to check whether the stewardship of the management is in agreement with the applicable ordinances and special decisions.

The review has been carried out in accordance with good auditing practice. This means that the review has been planned and conducted with the aim of obtaining a reasonable basis for assessing whether or not the annual and consolidated accounts are true and correct. The review has thus focused on a selection of significant transactions and management decisions.

The review carried out provides a reasonable basis for the statement below.

The annual and consolidated accounts have been drawn up in compliance with the ordinance governing the annual accounts and budget data, government appropriation documents and other rulings relating to the authority.

The NAO deems the annual and consolidated accounts to be substantially true and correct.

Director of Auditing Kerstin Jönsson has passed judgement in this matter. Director of Auditing, chartered accountant Göran Selander has acted as the especially appointed submitter. Chief Auditor Gina Funnemark has participated in the final processing.

The National Audit Office auditor's report was submitted on 1 March 2004.

Kerstin Jönsson	Göran Selander
Director of Auditing	*Director of Auditing*

Svenska Kraftnät and the environment:

Improvements in several areas

The work of developing Svenska Kraftnät's environmental management system is being conducted in the form of a project and involves many of our employees. Work focuses on operations that concern our installations. "We are going through the various work processes to determine the environmental impact and what we can do about it", says Eva Bergius who is our Environment Manager (third from left).

The environmental improvements that Svenska Kraftnät is implementing are linked to the fifteen national goals for environmental quality adopted by Parliament. The measures primarily contribute towards meeting the following goals; limited environmental impact, a non-toxic environment, a safe radiation environment, and a good environment in developed areas. Additionally, we are endeavouring to promote biological multiplicity in our power lanes. Biological multiplicity has been proposed as the 16th national environmental quality goal.

During 2003, we have also been working on improving the structure and routines of our environmental management system. The intention is to build up a simple but functional system which is primarily focused on operations that concern our installations. Using the environmental management system, we will be able to improve the quality of our environmental work though the uniform application of routines and methods.

Measures for limiting our environmental impact

Svenska Kraftnät aims to achieve efficient energy consumption and low energy losses. The emissions of climate-impacting gases that we give rise to must be as small as possible.

During the transmission of power across the network, energy losses arise. On the national grid, losses are approximately 2% of the exit energy. For some years, we have been developing methods of reducing some of the losses arising during the winter due to the corona effect, i.e. discharges into the air from power lines. The monitoring of corona losses and measures to reduce these are now being carried out on a routine basis by the staff of our control rooms. This is conditional upon the measures being carried out without reducing operational reliability and that they reduce overall losses on the grid. We estimate that corona losses, which constitute a tenth of overall grid losses, can be reduced by about 10% using such measures.

During the year, emissions of the greenhouse gas sulphur hexafluoride (SF_6), which is used in circuit breakers and in gasinsulated switchyards (GIS), have amounted to 0.13% of the installed volume. This is down on previous years. At the GIS switchyard at Järva, in northern Stockholm, we have measured a level of leakage which is greater than normal. Consequently, we have replaced bursting discs there in order to make the gas chambers gastight. In connection with the overhaul of contact breakers, gaskets have been changed in order to achieve an improved seal.

During the year, more refrigerating machines using HCFCs have been replaced by units using less environmentally-impacting refrigerants.

Business travelling made by Svenska Kraftnät's staff continued to fall during 2003. Some journeys have been replaced by video conferences. On average, one video conference has been held every other working day.

Introduction of the energy certificate system

On 1 May 2003, the system of renewable electricity certificates was introduced. This is based upon the producers of renewable energy obtaining certificates for the electricity that they produce. Each MWh (megawatt hour) equals one certificate. The sale of renewable electricity certificates will provide producers with revenues that are over and above what they make on selling electricity.

For renewable electricity certificates to be issued, the generating plant must have been approved by the Swedish National Energy Administration. Svenska Kraftnät's brief is to issue and manage these certificates. By the end of last year, we had issued approximately 5 million certificates.

To create a demand for the certificates, an obligatory quota has been introduced. It is obligatory for electricity

suppliers and/or consumers to purchase a certain number of certificates in relation to their sale/consumption. Each year, this obligatory quota increases, i.e. the number of certificates that electricity suppliers/consumers are obliged to purchase. This will increase the demand for certificates and in doing so stimulate the production of renewable electricity. In normal cases, electricity suppliers will take care of the purchasing of certificates for their customers and will thus be responsible for their obligatory quotas being met.

Coming closer to a non-toxic environment

One of Svenska Kraftnät's most important goals is to limit the use of environmentally-destructive substances. These substances are primarily heavy metals and certain chemicals, e.g. impregnating agents in wooden poles and foundations.

The decommissioning of components containing quicksilver has continued during 2003. We also started work on the new converter station for the Kontiskan 1 DC link (between Sweden and Jutland) at Lindome, south of Gothenburg. This station will replace the one at Stenkullen, Lerum. When the new station is completed, about 1,800 kg of mercury from the old gas-filled valves at Stenkullen will be able to be decommissioned.

Some equipment may contain oil contaminated by PCB. It is always a routine procedure, consequently, that we take oil samples from equipment like this before scrapping it. In an ongoing R&D project, different methods of testing for PCB in transformer oil are being compared.

Two modern oil storage tanks have been installed at the gas turbine plant at Hallstavik, Uppland. The old tanks, which are still in situ, lack leakage containment and have thus been deemed unsuitable for fuel storage. Following this investment, Hallstavik gas turbine units 3 and 4 can now be used to provide power reserves.

Minor impact on our surroundings – an important environmental aspect

Svenska Kraftnät's objective is that our power lines and stations will affect the environment as little as possible. The exposure of people to electrical and magnetic fields and the impact upon the countryside are important environmental factors for us to consider. This is mostly possible while we are building new installations.

As during previous years, we have conducted enquiries and implemented concrete measures in order to get to grips with the problems experienced by those living close to our power lines, as regards magnetic fields. Among other things, we have provided details of how a line in western Stockholm can be modified in order to reduce the magnetic field in an adjacent school. This modification will be paid for by the borough council for the area.

The development of new designs for reducing the impact of power lines on their surroundings has continued at R&D company STRI AB, in Ludvika. The development work includes a 220 kV compact pylon for built-up areas and a pylon design for terminating underground cables.

As during previous years, Svenska Kraftnät has also contributed to R&D on electrical and magnetic fields via its associated company Elforsk AB.

Living environment prioritized in the Stenkullen-Lindome project

In its project to build a new 400 kV line between Stenkullen and Lindome, in the Gothenburg area, Svenska Kraftnät produced an environmental impact assessment (EIA) during the year. We have investigated two alternative routes as well as several alternative sections and technical configurations within one of the routes.

During the enquiry, it has at times been necessary to weigh different environmental aspects against each other and to make priorities. Due to the fact that this line will pass close by a lot of residences, we have chosen to prioritize the living environment over other considerations. We have thus proposed that the line be routed through the Härskog area of Härryda municipality, despite the fact that this is an area of national interest as regards the outdoor life.

By routing the line through the Härskog area, we will be able to keep it away from the developed part of the Skårtorp community – with stronger magnetic fields in homes as a result. Our assessment is that the line will have a negligible effect on the outdoor life. The impact on

Svenska Kraftnät is planning to build a new 400 kV line between the stations at Stenkullen and Lindome, in the Gothenburg area. When crossing trunk road 40, one alternative would be to erect the line using specially designed compact pylons, which are well-suited to the environment in question (composite picture of design pylons in situ). See also the above picture.

Forest inspectors employed by Svenska Kraftnät's subcontractors reviewing which species are typical of this particular meadow just outside Uppsala.

the countryside and on the natural and cultural environments will also be slight.

On other sections, where developed areas lie close by, we propose that the line should be built using compact pylons. Compared with traditional π-towers, these are designed to cause weaker magnetic fields which decay more rapidly as you move laterally away from them. The shorter distance between the line's outer wires also requires a narrower power lane.

When crossing trunk road 40, the line will be clearly exposed to its surroundings. Here, an alternative could be erecting the line using specially-designed compact pylons, which are well-suited to the environment in question.

Forest inspectors being trained in biological multiplicity

With the help of our subcontractors, we would like to adapt the management of our power lanes in such a way that attention is paid to sensitive environments and the biological diversity benefits. In the power lane, many species thrive which have their natural habitats in meadows and pastures. These species are under threat today because fewer and fewer of these areas remain.

In early summer 2003, Svenska Kraftnät conducted a pilot training course on the theme of "Biological multiplicity in the power lane" for forest inspectors from Eltel Networks and Vattenfall Service Syd. The idea is that the forest inspectors, while simultaneously inspecting the power lane, will also be able to find locations with great natural assets and propose a suitable type of management for them. By modifying the management of the power lanes using rather small means, e.g. keeping them open and removing clearing waste, the circumstances can be improved for the threatened species, making them thrive even better.

During the summer, the forest inspectors tried out their newly-acquired skills during inspection work. The method showed itself to work well. At the particularly valuable locations found during inspections, particular care will be taken during future clearing operations.

Since the spring of 2002, we have also been collaborating with the Institution for Conservation Biology at the Swedish University of Agricultural Sciences (SUAS). The SUAS is conducting experiments on sample plots in some power lanes in Uppland and Småland using different types of management. During the summer of 2002, an initial inventory of species was carried out to determine the starting position. During 2003, the areas were managed and inventoried once again. It will not be possible until another few seasons of enhanced management have elapsed to see whether or not the desired positive changes have occurred.

Environment and economics

When reporting Svenska Kraftnät's environmental overheads and environmentally-related investments, we have applied the definitions that Statistics Sweden uses when investigating corporate expenditure on environmental protection. This expenditure relates to measures and activities where the principal purpose has been to prevent, reduce or eliminate a negative environmental impact.

Some environmental data

	2003	2002	2001
Energy losses, TWh	2.5	2.7	2.8
Energy losses, percentage of exit energy, %	2.1	2.2	2.2
Emissions by CO_2, from own gas turbines, tonnes	40,297*	3,611	2,287
Emissions of sulphur, from own gas turbines, kg	21,901*	1,995	1,238
Emissions of nitric oxides, from own gas turbines, kg	197,913*	8,133	5,263
Volume of replenished SF_6-gas, kg	21	31	47
Emissions of SF_6-gas, percentage of installed volume, %	0.1	0.2	0.3
No. of business trips per employee per year	9.3	10.7	11.0

* Svenska Kraftnät's gas turbines have been employed much more than usual, due to the power balance at the start of 2003.

Environmental overheads during 2003 (kSEK)

Environmental management	87
Oil decontamination	280
Disposal of PCB-contaminated oil	17
Ground water analyses, Lahall	40
Program for soil analysis, Hallstavik	110
Biological multiplicity, training and measures	207
Environmental surveys re. fish, SwePol Link	862
R&D:	
• Electrical and magnetic fields	377
• Compact pylon for 220 kV, STRI	590
• Cable transition to pylon 400 kV, pre-study	290
• Methods of testing for PCB in transformer oil	61
• Biological multiplicity in power lanes	453
In total	3,374

Environmentally-related investment during 2003 (kSEK)

New oil storage tanks at Hallstavik	28,500
Measures for reducing magnetic fields	250
Conversion of refrigerants	204
Measures for reducing SF_6-leakage	258
Replacement of components containing quicksilver	7
In total	29,219

Major outages occurred during 2003

”During the afternoon of 23rd of September, we were able to clarify the primary course of events of this major outage”, says Anders Danell, pictured at right. He has been in charge of the work of analysing this outage, together with Erik Ek and Thomas Thor (in the middle), among others.

On September 23, southern Sweden and eastern Denmark were exposed to an extensive power outage. Seen from Svenska Kraftnät’s perspective – as the Swedish System Operator – it had been twenty years since anything like this had occurred. The sometimes lengthy outages occurring on the distribution networks which are caused by storms and heavy falls of snow lie outside our area of responsibility. From the perspective of our customers, of course, it is always bad to lose the electricity supply regardless of the cause. A characteristic for Svenska Kraftnät’s area of responsibility is that a technical fault can lead to outages not only in large parts of Sweden but also in neighbouring countries.

Extensive black-outs in major power systems almost never arise because of one single root cause. An exception to this is, of course, severe natural catastrophes such as the earthquakes in Japan in 1995. It is typical that outages arise as a consequence of several different technical faults occurring close to each other in time, or through mutual interdependencies. Frequently, in this case, dormant faults come to light, which had not been discovered or rectified previously.

Sometimes, critical situations can arise or be exacerbated by incorrect human actions. In many cases, it can also be established that active efforts during the acute phase would have been enough to prevent minor misfunctions from developing into widespread outages. These failing to materialize could be due to a lack of training, information, coordination or unambiguous powers to act. There are also examples of effective interventions that have saved major networks from collapsing.

USA and Canada in August

The major outages in the USA and Canada in August 2003, and in Italy in September, share the fact that they each affected over fifty million inhabitants. Moreover, subsequent analyses have shown that both outages could have been avoided by means of resolute interventions on the part of the operational management concerned.

Over a period of approximately 4 hours prior to the outage in the USA and Canada, a series of events occurred which, taken individually, were not particularly remarkable. Together, however, they constituted a dangerous situation as regards system reliability. This antecedent took place in northern Ohio and adjacent states south of Lake Erie. The weather was warm, but not so extreme that the consumption attributable to air conditioning units would lead to the networks being overloaded initially.

However, the loss of production plants generating close to 2,000 MW led to transmission lines becoming overloaded. One of these was disconnected after a flash-over to a tree, which had not been cleared away from a power right of way. By degrees, more and more disconnected lines led to major shifts in the power flows around Lake Erie, impacting upon the states of Pennsylvania, New York, eastern Michigan and Ontario in Canada. Huge swings in power and voltage triggered protective devices, which disconnected power plants and isolated parts of the grid. Some subnetworks survived this turbulent phase while others collapsed, e.g. most of New York State.

The Task Force appointed by the governments of the US and Canada has focused on the lack of supervisory control and monitoring of the numerous regional networks. These networks have gradually evolved from regional supply networks into the present-day interconnected parts of the three synchronous grids in the USA. The development of effective control agencies with sufficient information and authority to intervene during critical operational scenarios has not been carried out in step with the changes otherwise taking place.

The lack of efficient coordination and control that has been observed is both organisational and technical. The result of these shortcomings was that the initial

situation, which was gradually becoming more and more critical, was not dealt with properly by the operational managers of the different companies. The correct countermeasures were not taken, despite the fact that there was time.

Italy in September

When the black-out in Italy occurred on the Saturday night, approx. 6,400 MW was being imported, primarily from Switzerland and France, via a limited number of 400 and 220 kV lines in the alpine region. Consequently, these were carrying a considerable load. The disturbance had its origin in one of these 400 kV lines in Switzerland being disconnected, whereupon the power was redistributed to the other lines. One of them was carrying a load far in excess of what it could cope with and was disconnected after approximately 20 minutes. For both these disconnected lines, the reason has been stated as flashovers to trees, which had been allowed to grow too tall in the power right of way.

The effect of these lines disappearing was that the remaining lines were not able to deal with transmitting the imported power and were then disconnected, thus isolating Italy. Despite the active countermeasures subsequently taken, the system could not be brought back into balance in time before the power plants were disconnected one after another by their protection devices. All of Italy, with the exception of Sardinia, was plunged into darkness.

Afterwards, it has been learnt that it would have been possible to deal with the initial stresses and strains, primarily by interrupting the pumped storage plant in Italy, which were consuming 3,500 MW.

The Italian outage also revealed a factor which is increasingly coming to characterize the operation of major transmission networks. The risk of critical operational scenarios and power outages arising is at its highest if faults occur when the networks are under the greatest loading. Traditionally, this is associated with times when consumption during weekdays is at its highest. Gradually, production resources in many countries are tending to become more and more sparse in relation to the increased level of consumption. Many countries or subsystems have periodically or permanently become dependent upon imports for their power balances.

"Within one hour, my colleagues at the National Control Centre had restored the grid down to southern Sweden", says Eva Werdin, duty engineer at Svenska Kraftnät's control room. Following this, it took a few more hours before all our customers had their supply restored.

This often leads to transmission networks carrying heavy loads for long periods, sometimes during periods, as well as in directions, which were not envisaged when the networks were being dimensioned.

Southern Sweden and eastern Denmark in September

The black-out in southern Sweden on 23 September– as opposed to those taking place in the USA/Canada and Italy – can be characterized by several faults occurring either simultaneously or very close in time to each other. The initial loss of the largest nuclear power block at Oskarshamn was, in itself, an ordinary event, which would not normally lead to difficulties. Measures were embarked upon, anyway, to make up for the loss.

The critical situation arose five minutes later, when a dormant fault in an disconnector at the Horred substation on Sweden's west coast turned into a failure. This in turn led to a long arc arising which short-circuited important parts of the switchyard. All protection devices operated correctly, however, in order to disconnect the faults. The result was another two large nuclear power blocks at Ringhals being disconnected and the grid on the west coast being disrupted.

At this point, a total of 3,000 MW of nuclear power generation had been lost, along with the reactive power support for the grid from the generators of these units. The strain was thus too great for the rest of the grid, which was divided in the then weakest part of central Sweden. The southern part of Sweden, and eastern Denmark, did not have the prerequisites to cope on their own and lost voltage within a few seconds.

This event shows that the transmission system is sensitive during unusual and unfortunate circumstances, e.g. if plants have to go off line for some reason and with regard to defects at installations which are in service. Faults like these occur from time to time due to material defects or the age of the components. By means of our normal practice to carry out maintenance and disturbance analysis of the grid, we discover and correct a good many such defects every year. In doing so, we eliminate apparently trivial faults which could potentially result in more severe disruptions. This has contributed to avoiding widespread outages due to faults on the national grid over a period of twenty years.

Svenska Kraftnät's technical expertise was able to clarify, as early as the afternoon of 23 September, the primary course of events of the black-out. This was further confirmed by the extensive analyses forming the basis of the report published on 4 November. This report can be found on our website; *www.svk.se*.

The outage will effect our work in the future

The black-out of September 23 has led Svenska Kraftnät to the conclusion that we should look into how the grid can be made even more reliable. The risk of widespread disruptions has not increased over the past decade. But the susceptibility of society to outages – both physically and perceptually – has increased during that period. Henceforth, this will manifestly characterise our focus and our work.

When the isolator at the Horred station failed, an arc arose which short-circuited parts of the switchyard. The damage to the isolator can be seen in the inset picture.

A vision for grid reinforcement in the Nordic area

”The new and augmented lines that are planned for the Nordic area will entail the transmission capacity between the Nordic countries gradually increasing”, says Elisabet Norgren, in the middle. Elisabet, Amanda Zhao and Magnus Danielsson work with grid development.

Transmission networks in focus

In the open electricity market of today, the transmission of power, especially between countries, has come into focus. The capacity of the networks is important for the electricity market to function well. It is also clearly noticeable when this capacity is not sufficient for power trading, e.g. by the occurrence of a price division in spot trading.

The issues surrounding power transmission have thus come to affect and interest all the players on the electricity market in an entirely different way than they did previously. The reliability of the networks is also being noticed more today, especially after the outage of 23 September 2003.

The ongoing and upcoming network changes that we can see will entail that our capacity for transmission in a north-south direction will gradually increase. Measures to boost the capacity of the networks need to be taken along more or less the entire route, from the Continent to Arctic Scandinavia. With even more cables to the Continent, the Nordic area’s energy balance will be able to improve due to an increased import capability. Through increased trading opportunities, Nordic hydropower will be able to produce more during peak loads, when prices on the Continent are at their highest.

The need for increased transmission

The market

Since deregulation, which occurred in Sweden in 1996, the electricity market is working better and better. Price formation is becoming more efficient and more transparent via the open power exchanges. Cross-border trading is being eased by the removal of cross-border tariffs and administrative obstacles. The players in the marketplace are becoming more and more experienced and effective in their trading. This trend is continuing the whole time.

Cross-border power trading is gradually increasing, also between the Nordic area and the Continent. Trading is increasingly being governed by differences in the electricity spot price between Nord Pool the power exchanges of Europe. Low transaction costs ensure that trading is often carried out as a full export or a full import.

The Swedish grid is being utilized more and more heavily in a north-south and a south-north direction. The natural price differences throughout the calendar day and week mean that power travels northwards during the night and at weekends. During the day, when the need for power on the Continent is great, like its ability to pay, power travels south.

During years when there is either a scarse or an abundant water balance in the Nordic area, there are significant power transmissions via the electricity system. It is primarily during such years when extensive bottlenecks can arise in the system.

The energy and power balance of the Nordic area

The electrical energy balance of the Nordic area is becoming increasingly strained. As a whole, the area is dependent upon imports of power from the Continent and Russia. This situation will be intensified during the coming years due to the increasing level of consumption.

Following deregulation of the electricity market in 1996, a large amount of thermal power – which was not considered profitable to operate in Sweden, Finland and Denmark – was decommissioned. The power balance suffered most from this. During recent years, some of these production units have again been made ready for operation, partly because of measures taken by society or system operators and partly because of commercial decisions made by their owners. On the Continent, too, some capacity was “mothballed” due to poor profitability following deregulation.

In the Nordic area, it is primarily Norway’s energy balance during dry years which shows significant deficits.

Expansion of production
A more wide-ranging expansion of wind power has so far taken place in Denmark. Wide-ranging expansions may come about in northern Norway, in the Swedish mountains and in the sea along the coast of northern Sweden or in southern Sweden. The projects under discussion are in the range of 500–1,000 MW. Consequently, in addition to a local connection point with the nearest network, reinforcement of the grid will also be required; in many cases in order to transmit the power over longer distances. It might also be necessary to reinforce the grid in order to be able to transmit sufficient regulating power to manage the rapid variations of wind power.

In Finland, there are plans to build a third nuclear power plant. Rated at 1,600 MW, it will be the biggest production unit in the Nordic area. Its considerable output power alone will entail the transmission capacity between Sweden and Finland being reduced by about 300 MW, if no measures are taken. The power plant will operate as a part of base production and will have a lengthy utilization time. This will probably lead to electricity exports from Finland for long periods of time. A reinforcement of the transmission capacity between our countries will thus be necessary.

Opportunities to accomplish reinforcement

During recent years, system protection schemes to support the grid capacity have been installed in southern Sweden and between Norway and Sweden. Because system protection automatically disconnects production or lines/cables in the event of conductor failures – in order to avoid overloads in the rest of the network – the transmission capacity of the network can be increased.

In southern Sweden, shunt capacitors have also been installed. When these are connected, the voltage is increased and thus also the transmission capacity. Another technique which boosts the transmission capacity is installing series capacitors.

There is, however, a limit to how much of a network's capacity can be exploited using such measures. The next step is to rebuild substations or build new ones. One such example is the 400 kV station at Hemsjö in southern Sweden, (Blekinge), which was commissioned in 2003. The modern design of the station has reduced the risk of serious faults and boosted the southbound transmission capacity. A more substantial measure is building new lines.

The necessary reinforcement facing us can, in some cases, be met using several of the measures mentioned. Concerning southern Sweden, however, the limit has been reached as regards utilizing existing networks further. Here, only new lines will provide a significant increase.

Vision of an expanded network

Line from central to southern Sweden. Today it is the network between central and southern Sweden, which periodically limits the possibility of carrying major electricity exports southwards. Often, simultaneous full exports on the SwePol Link, Baltic Cable and Öresund interconnectors with Zealand are impossible. The transmission capacity towards southern Sweden has, over a period of several years, gradually been increased by expanding lines, rebuilding stations and installing reactive power and network protection.

To further increase the transmission capacity, new lines will be needed. A new 400 kV line from central to southern Sweden could be built along existing system for 220 and 130 kV lines. The new line would primarily boost the transmission capacity southwards and make the grid's southern section more robust.

Northern Sweden. The expansion of wind power in the north requires expansion of the network locally, as well as capacity for transmitting the power southwards. The grid capacity south of the Luleälven river will probably be a limiting factor. Here, the transmission capacity can be increased by installing series capacitors. These have existed for a long time, south of the Indalsälven river.

Finland. The need for reinforcement towards Finland doesn't only depend on the north-south transmission capacity. The expansion of nuclear power in Finland is another reason for the network needing to be expanded. Reinforcement can be achieved by increasing the Fennoskan DC link or the lines in the north. The strategically most interesting expansion is a new DC cable in parallel with the existing one. If the new installation is designed in the appropriate way, it will be able, together with the existing one, to be operated as a bipol. This will then avoid the return current going through water.

Skagerrak 4. The driving force for further reinforcement of power transmissions between Norway and Jutland is Norway's increasingly tight energy balance. The increased transmission capacity can also be used for more efficient regulation of the rapid variations of Jutland's wind power. For various reasons, several planned cable projects from southern Norway have not been able to be realized. The project should be seen as an accompaniment to reinforcement in Jutland and increased capacity on the border between Jutland and Germany.

The Great Belt. An interconnector across the Great Belt between Jutland and Zealand in Denmark has been the subject of discussion for many years. It has again become topical following the outage on 23 September. Besides the fact that it will connect the two Danish subsystems, it will also provide more efficient regulation of the variations in Danish wind power. Additionally, the link can connect Germany-Jutland-Southern Norway/Sweden with Germany/Zealand/Poland-Southern Sweden, and direct north-southbound power to a part of the network with free capacity.

During the outage of September 23, it was a long time before customers in Zealand could be connected to the network again. A Great Belt link using new DC technology (HVDC) might have speeded up this course of events.

The vision. The individual projects are to be seen as parts of a strategy of reinforcing the Nordic transmission network over a ten-year period. The driving forces are the market's need for increased cross-border power trading and the tight energy balance and its accompanying import requirements. Other driving forces are the expansion of production, for instance large wind power plants, and the ambition to attain increased flexibility and operational reliability.

"The new 400 kV line between Stenkullen and Lindome will augment the electricity supply to Gothenburg", says Katrin Seuss from Svenska Kraftnät, pictured furthest to the right. She is a member of the project group responsible for the line.

Developments on the Nordic and European electricity markets

"The transmission of power between Sweden and other countries is becoming more and more extensive", says Marketing Manager Cecilia Hellner (on the left). Together with Christina Simón and Hans Jacob Nilsen, she works on the development of opportunities for cross-border power trading.

Developments on the Nordic electricity market

The integration of the Nordic electricity market has been rapid and successful. Largely speaking, the Nordic market is working well, which was borne out by the stresses and strains of the winter of 2002–2003.

A reduced availability of hydro power resulted in electricity generating plants which had been "mothballed" going back into service. Moreover, imports of electricity increased while consumption fell slightly, especially in Norway.

The grid operators of the Nordic area – Svenska Kraftnät, Statnett, Fingrid and Eltra (in Jutland/Funen) and Elkraft System (in Zealand) – are working ambitiously, within the framework of Nordel. Their objective is, within a range of areas, to further harmonise the rules of play for the players active on the Nordic electricity market.

Collaboration between the Nordic System Operators means that expansions of the network will be jointly planned, with the Nordic market's requirements as a starting point. During the spring of 2004, Nordel will provide details of the next stage of the system development plan. An advanced socio-economic assessment will be made of the most interesting expansion projects. Here, factors such as market benefit and market power will also be illuminated. The objective is that the analysis will be able to form the basis for prioritizing the projects.

Svenska Kraftnät has announced the reinforcement of the capacity for transmitting power to southern Sweden. A new line from central to southern Sweden will also enhance the reliability of Sweden's power system. Additionally, the line will also bring improved opportunities of trading in power with Denmark, Germany and Poland.

Since Svenska Kraftnät's inception in 1992, the capacity for trading with Finland, Denmark and Norway has been increased by over 2,000 MW to 7,000 MW.

A good power balance is the foundation

A good power balance is a precondition for a secure supply of electricity. Today, there are somewhat differing models for tackling the supply of power – i.e. the supply capability during the hours of peak demand – in the Nordic area. A precondition for the Nordic electricity market's long-term growth is that the players of the Nordic area principally have the same responsibility and incentive for investing in new production capacity.

Shortly, Nordel is expected to present the results of work aimed at providing a common ground for safeguarding the power balance in the long-term. One fundamental point is that the rules will be based on commercial principles. This work also includes efforts that will promote flexibility in electricity consumption in the event of high prices. This could reduce the need for other measures and develop products for hedging against price-spikes during power shortages.

Trading in power via international links has increased since deregulation of the electricity market. This has led to the more efficient use of existing resources. As a consequence, constraints – so called bottlenecks, where the technical capacity of the lines in some cases is lower than the players' requirements as regards the transmission of electricity – have arisen in places where we have not previously imposed restrictions to power transmissions. In several cases, the capacity has been boosted by installing network protection.

Within Nordel, several activities are ongoing to ensure that the transmission capacity is used optimally and to reduce the risk of dividing up the electricity market. One such activity is the Nordic Grid Master Plan.

A clearer system of rules, new methods for determining capacity and increased use of counter-trading are other elements of this work. One question, of course, is how much counter-trading will be required to reduce the risk of division

into price areas, and how the cost of this trading is to be distributed. A reasonable principle is that whoever benefits from counter-trading should also bear the cost of it.

In the long-term, some form of Nordic ”marketplace fee” should be introduced, in the opinion of Svenska Kraftnät. Such a fee would be able to finance measures taken over and above what is justifiable for supply reasons, but which is nevertheless justifiable in order for the market to be able to work better. This issue is currently being investigated by Nordel.

Integration of the European electricity market under way

The European electricity market is also developing rapidly. The market is expanding through Poland, the Czech Republic, Slovakia, Slovenia and Hungary joining the EU in 2004. The reformation of the Polish electricity market is of particular interest to Sweden. The transmission of power between Sweden and Poland via the SwePol Link is increasingly being carried out in accordance with commercial principles, i.e. the direction of the flows is governed by market prices. During the winter of the dry year of 2003, imports from Poland made a valuable contribution to the power supply of the Nordic area.

The European Commission has presented a strategy and a time plan for completion of the inner energy market. The goal is that consumers will be able to choose their electricity supplier freely from any EU country, without being hindered by national rules. This development is expected to take place gradually and through the establishment of regional electricity markets, like the Nordic one.

EU directive and regulation will come into force in July 2004

Changes to the electricity market directive and the regulation governing cross-border trading in electricity will come into force on 1 July 2004. The directive contains, among other things, dates for fully opening up the electricity markets of the EU, as well as requirements for independent supervisory authorities and non-discriminatory access to the grid.

The regulation contains stipulations regarding the handling of the grid operators’ costs during cross-border power trading in order to remove discriminatory border tariffs. Grid operators who make their grids available for power transits will obtain financial compensation for costs connected with such transit flows. Compensation for transits will be financed via the grid operators of the countries giving rise to the transit flows in other countries’ grids.

Additionally, the regulation stipulates that the distribution of trading capacity at bottlenecks during power transmission is to be dealt with using commercial methods. Examples of these are market splitting and counter-trading, which are used on the Nordic electricity market. Securing in this way an open and efficient utilization of the interconnectors for power transmission will contribute towards promoting competition on the electricity market. Harmonisation of the grid tariffs is also pointed out as a precondition for cross-border power-trading.

Several other measures under consideration

In December 2003, the European Commission revealed proposed measures for augmenting the supply security of the electricity market. One measure is joint rules for safeguarding the power balance. The proposal is remarkable in several ways, especially with regard to how it views the role and responsibility of the government and the market with regard to peak load capacity.

According to the EU proposal, it is the duty of the grid operators to maintain the reserves necessary for ensuring a balance between supply and demand. From Sweden’s point of view, this is a duty which – at least in the long-term – clearly has to be left to the players active in the marketplace. Otherwise, there is a risk of undermining price formation and the signals sent to these players regarding the need for investment.

The proposal also includes stipulations that provide the regulatory authorities with more responsibility for the duties currently resting with the grid operators. Here, there is an obvious risk of increased – and unnecessary – bureaucracy. The European grid operators have agreed, via their coordinating body ETSO, on principles for transit compensation for a further year. The system has been expanded and now includes a large part of the EU, including the accession countries, plus Norway and Switzerland. Imports from adjacent countries are also affected.

Another change is that the grid operators’ costs regarding transit compensation are to be financed via the grid tariff of the respective country. Consequently, special fees will no longer be debited from the market players exporting electricity.

The agreement on transit compensation has certain shortcomings. Despite Sweden being a transit country, Svenska Kraftnät risks becoming a net contributor to the joint fund. The reason for this is that, in an international comparison, we have considerably lower costs on our grid. This in turn entails that our compensation claims for our infrastructure are considerably lower than most of the other grid operators’ claims. We get paid for making the Swedish grid available for transit flows and the compensation for this is linked to the Swedish grid tariff’s (low) level.

When Svenska Kraftnät pays for the transit flows it causes in other countries’ networks, the price is higher because the compensation is linked to the tariff level in operation in these countries. Thus, the result could be that we become net contributors, despite Sweden only being a transit country.

This model thus disfavours countries with low network costs. In our opinion, it must be seen as a temporary solution which should evolve towards cost efficiency gaining greater importance.

“At ETSO, the coordinating body of the European grid operators, one of the things we are working on is how compensation will be paid for power transits via an intermediate country”, says Roger Kearsley, second from the left. Roger is the Chairman of ETSO’s transit group. Here he is discussing market issues with colleagues Jenny Fridström, Hans Jacob Nilsen and Cecilia Hellner (pictured in the foreground with her back to the camera).

An attractive workplace – also for the parents of small children

Part of Svenska Kraftnät's staff policy is being a good employer, also of parents with small children. We try to live up to this by:

- Supplementing parental allowance by up to 90% on all levels of income.
- Offering the opportunity to distance-working.
- Supplying IT aids for the home workplace.
- Having flexible hours of working.
- Not discriminating against those on parental leave during salary revisions.
- Having a generally generous attitude towards parents of small children.

Here are a few examples of those who have made use of these opportunities.

Svenska Kraftnät is working towards being an attractive workplace, among other things through good leadership, responsible employees and common values.

During 2003, we drew up some basic common values. These can be summarized using the keywords *efficiency*, *quality*, *social responsibility*, *sprit of collaboration* and *team-spirit*.

Lars, Chief Financial Officer

Lars Ericsson is Chief Financial Officer of Svenska Kraftnät and father of Daniel and Joel.

– When we had our first son Daniel in 2002, we decided to share our parental leave right from the start. I presented my boss and my colleagues in the department with a plan, which was well received by both, says Lars. The fact that I would additionally be getting a supplementary parental wage from Svenska Kraftnät simplified our decision.

This was the start of an arduous, enjoyable and somewhat exerting time. In the run-up to closing the accounts for 2002, things began to get really demanding and Lars noticed that his 50% working week was tending to increase considerably.

– My wife also works with finances and accounting and we both often have to work very hard at the end of each year. The budget, final accounts and annual report have to be drawn up during this period.

Lars Ericsson with his boys Daniel and Joel. All children newly-born to employees of Svenska Kraftnät get teddy bears in a beautiful shade of red used by the company.

Lars mulled his situation over and then proposed a new solution. This entailed working 75%, split into 50% attendance at the office and 25% distance-working – in accordance with Svenska Kraftnät's policy – and being on parental leave for the remaining 25%. And that's how it turned out.

In July 2003, Lars and his wife had another son.

– So I continued with my parental leave part time, without a break. During the 2003 annual accounts, my wife and I had two small children to take care of. So we had to plan our time well, concludes Lars.

Anna-Karin, Engineer

Anna-Karin Gustafsson is an acting unit manager, engineer and the mother of Adam and Axel. Anna-Karin was on parental leave periodically between September 1999 and August 2003.

– Svenska Kraftnät has a healthy attitude towards the parents of small children. For me, my manager's positive attitude has meant a lot.

– While on parental leave, I have been included in two salary reviews and have not felt treated any differently to my colleagues. I have been appraised "as if I had been at work", says Anna-Karin.

Anna-Karin Gustafsson with her children Adam and Axel.

Magnus, unit manager

Magnus Stephansson is a newly-appointed unit manager and father of twins Liv and Elias. Magnus was on parental leave between September 2003 and January 2004. In actual fact, these were his early months after being appointed as a manager at Svenska Kraftnät. Magnus is currently working 75%.

– Having a full life to me means being able to function at work and at home. As a relatively new father, I was offered the job of manager of the Market Design unit, explains Magnus.

– I knew that my employer's view of what a full life means was the same as mine. This was an important part of accepting the managerial post. This means shouldering a double responsibility – as a dad and as a mainstay for my staff. So far, things have worked well, even though I have realised that things will inevitably get rather difficult in the future. As several people at my unit have had similar experiences, I have encountered a lot of understanding from my colleagues as well. My unconditional presence is simply not always so important – the telephone and email are excellent tools for communicating, concludes Magnus.

Magnus Stephansson with twins Liv and Elias.

Pia, IT Assistant

Pia Edström works as an assistant in the IT department and is the mother of Elliot. She went on parental leave in December 2003.

– I think that Svenska Kraftnät has a very positive attitude regarding my parental leave and I am treated well and with interest by my workmates and managers. The company made it possible for me to connect to my office from home using my PC, so that I would be able to be a part of and involved in my job the whole time. So I have plenty of opportunities to keep in touch with my workmates and closely follow events at Svenska Kraftnät, explains Pia.

– This will make things easier when I return to work.

Pia Edström and son Elliot with his red teddy bear close at hand.

The Board


Sven Hulterström


Yvonne Gustafsson


Viktoria Aastrup


Sussi Kvart


Christel Nettelvik Söderberg


Christer Samuelsson


Jan Magnusson


Erik Bengtsson


Lisa Björkling

Sven Hulterström, Chairman
Born in 1938, apptd. 2003.
Other directorships: Chairman of AB Stokab.

Yvonne Gustafsson, Deputy Chairman
Born in 1952, apptd. 1995, Dep. Chairman 2001.
Director General, the Swedish National Financial Management Authority.
Other directorships: Bofors Defence AB, Styrelseakademien Stockholm.

Viktoria Aastrup
Born in 1971, apptd. 2001. Deputy Director, the Ministry for Industry, Employment and Communications.
Other directorships: Lernia AB, Förvaltningsaktiebolaget Stattum.

Sussi Kvart
Born in 1956, apptd. 1999.
Senior Advisor, Sussi Kvart AB.
Other directorships: Hennes & Mauritz AB, Chairman of the Board of KW Partners AB and KB.

Christel Nettelvik Söderberg
Born in 1957, apptd. 2001.
Head of Swedish operation JET, Conoco PhillipsNordic AB.

Christer Samuelsson
Born in 1954, apptd. 2001.
MD and Partner, Sensa Corporate Advisors AB.

Jan Magnusson
Born in 1948, apptd. 1998.
Director General of Svenska Kraftnät.
Other directorships: Chairman of the Board of Nord Pool ASA.

Erik Bengtsson
Born in 1956, apptd. 2002.
Staff representative.
Representative of the Swedish Confederation of Professional Associations.

Lisa Björkling
Born in 1955, apptd. 2001.
Staff representative.
Representative of the Swedish Federation of Civil Servants.

Power industry terms

Balance provider
Power trading company that has entered into a balance responsibility agreement with Svenska Kraftnät. Balance providers are obligated to ensure that a state of balance exists between the supply and consumption of power in respect of their undertakings.

Balance settlement
Svenska Kraftnät's calculation of the balance providers' imbalances on an hourly basis (balance power). This results in a financial settlement being produced every fourteen days in the form of an invoice (Svenska Kraftnät has sold balance power) or payment (the balance provider has sold balance power).

Balance power
The imbalance that the balance provider has caused in the national electricity system.

Bottleneck
Overloads in congested sectors on the grid and cross-border interconnectors.

Load frequency control
Svenska Kraftnät is responsible for always maintaining the frequency of the electrical grid at around 50 Hz. Deviations are compensated for via the rapid regulation of production.

Final power
The difference between the actual, metered values after 14 months and the preliminarily calculated data about consumption.

Counter trading
The purchase/sale of electricity carried out by the system operator, i.e. Svenska Kraftnät in Sweden, to reduce the transmission of electricity in a constraint on the grid. Counter trading prevents customers from experiencing transmission limitations.

System protection
A system for boosting the transmission capacity and/or operational reliability. For example, system protection exists on the DC links between southern Sweden and the continent. System protection immediately reduces electricity exports on the DC links if transmissions on the Swedish grid risk becoming too great.

Point of connection tariff
Fee for connection to the grid. The fee is based on the circumstances at the point of connection.

Profile settlement
A model for keeping tabs on and distributing the volume of consumed electricity not measured on an hourly basis. In doing so, deliveries can be correctly distributed among the players concerned.

Final settlement
Svenska Kraftnät calculates the difference between the balance providers' actual deliveries to profile customers (customers whose consumption is not measured on an hourly basis) and their preliminarily calculated deliveries to these customers. Final settlement means that the costs are redistributed between the balance providers.

Constraint
A constraint is a congested sector on the grid.

Spot market
Nord Pool's spot market, which is a marketplace for power. Agreements are made at lunchtime for all 24 hours of the following calendar day.

System-responsible company, System Operator
A company responsible for the reliability and balance of the national electricity system. Svenska Kraftnät has this role in Sweden.

System operation, (ancillary) services
Procured services, primarily from power producers, which are necessary for the technical operation of the system. This primarily includes frequency regulation and access to gas turbines as a disruption reserve.

Transit
The transmission of electricity via an intermediate country.

Island operation
Island operation entails an electricity system being operated locally within a limited geographic area (production, transmission and consumption). The area may have been disconnected spontaneously from the rest of the network or it may have been planned specifically for island operation.

Transmission losses
The energy losses occurring in a network.

Financial definitions

Net loan liability
Allocation and interest-bearing liabilities with deductions for financial interest-bearing assets.

Net profit margin
The income for the year with deductions for standard tax at 28% in relation to operating revenues.

Earning capacity of adjusted equity
The earning capacity is defined as the income for the year with deductions for standard tax (28%) divided by adjusted equity defined as the mean value of the restricted equity at the start of the year and at year-end (treasury capital and restricted reserves) and 72% of the unrestricted equity.

Earning capacity of employed capital
The result for the year plus interest charges in % of the average employed capital, i.e. the balance sheet total less non interest-bearing liabilities including deferred standard tax in equity.

Earning capacity of total capital
This earning capacity is defined as the ratio between the income for the year plus interest charges, and the total average capital.

Times interest earned
The income for the year plus interest charges divided by interest charges. Specifies how much greater the income is compared with the interest charges.

Operating margin
Operating income in relation to operating revenues.

Degree of self-financing
The degree of self-financing is defined as the cashflow prior to changes in the operating capital and investments in relation to the investments for the year.

Debt-equity ratio
The debt-equity ratio is defined as interest-bearing liabilities minus interest-bearing assets divided by adjusted equity including minority shares.

Equity/assets ratio
The equity/assts ratio is defined as the adjusted equity at year-end divided by the total capital. Adjusted equity is defined under Earning capacity of adjusted equity above.

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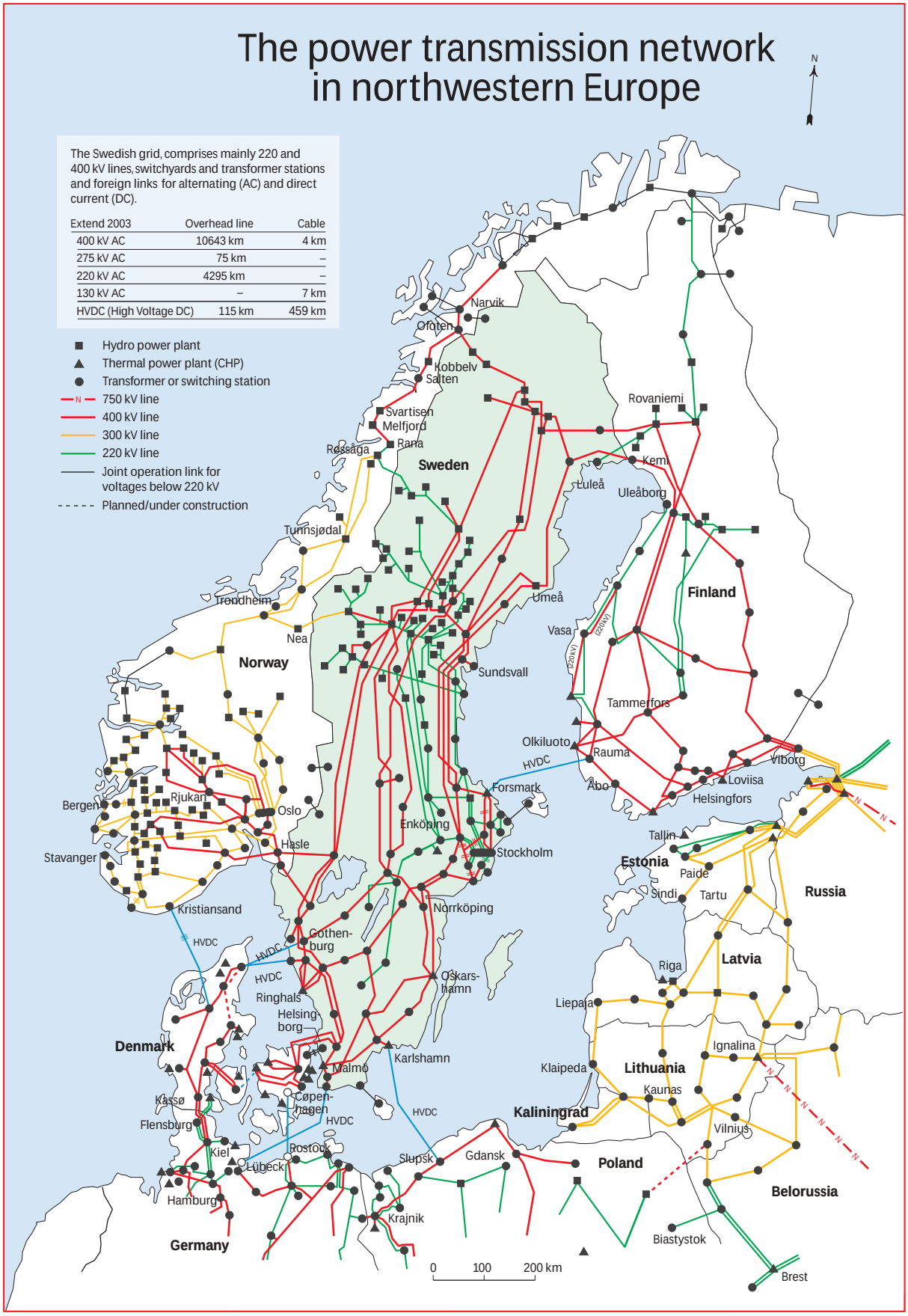
The power transmission network in northwestern Europe



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