

- **Less transmission due to the mild autumn: 117 (125) TWh**
- **High turnover: SEK 6,838 (5,885) million**
- **Good financial result: SEK 676 (880) million**
- **Substantial increase in rate of investment in the years ahead**
- **Environmental issues of increasing importance**



Svenska Kraftnät

# Annual Report 2006

## Svenska Kraftnät

Svenska Kraftnät manages the national grid for electric power, comprising the country's 400 kV and 220 kV power lines with substations, cross-border links etc. We also have system responsibility for electricity and natural gas in Sweden. Our principle task is to develop the national grid and the electricity market in order to satisfy society's need for a secure, economic electricity supply. At

the same time we have to meet a high level of environmental requirements.

We have some 300 employees, primarily at the head office in Vällingby in Stockholm. We also have offices in Sundsvall, Halmstad and Sollefteå as well as a training centre for linesmen on civil duty located in Åsbro outside Örebro. In addition, we employ several hundred people on a contract basis for ope-

ration and maintenance of the national grid throughout the country. Annual turnover is around SEK 7 billion.

Svenska Kraftnät has three subsidiaries and six associated companies, the largest of which is the Nordic trading exchange Nord Pool. More information is available on our website [www.svk.se](http://www.svk.se)

## 2006 in brief

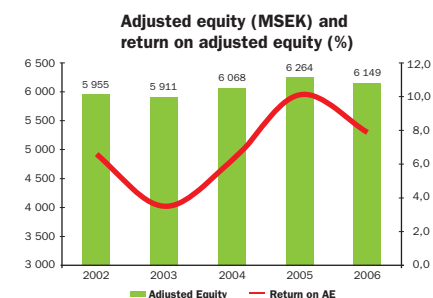
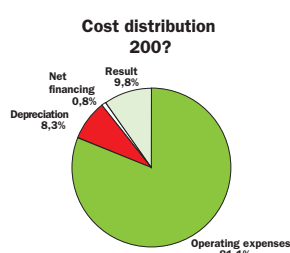
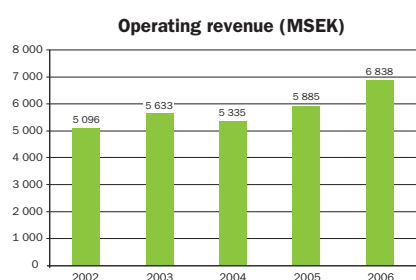
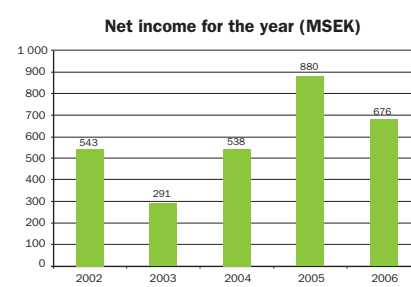
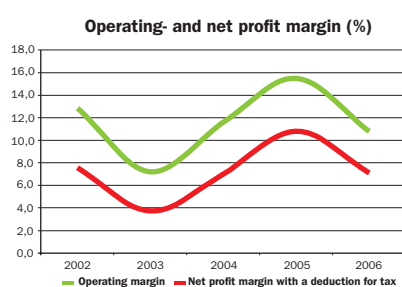
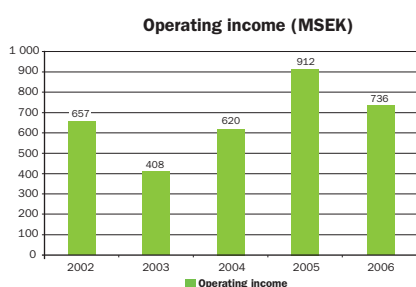
		2005	2006
<b>Operational data for the year</b>			
Energy supplied to the national grid	TWh	119.8	127.7
<b>Reliability performance</b>			
Operational disruptions on the grid	no.	181	251
Operational disruptions with failures	no.	15	22
Unsupplied energy	MWh	95	4
<b>Financial data</b>			
Group operating revenue	MSEK	6,838	5,885
Group income	MSEK	676	880
Return on adjusted equity*	%	7.9	10.1
Debt/Equity ratio		0.38	0.22
Investments	MSEK	478	338

\* after 28 % tax equivalence

## Our mission

- To provide transmission of power on the national grid well in compliance with security, efficiency and environmental requirements.
- To perform the system operator function for electricity and natural gas cost-efficiently.
- To promote an open Swedish, Nordic and European market for electricity and natural gas.
- To ensure a robust nationwide supply of electricity.

## Financial development



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# Important operational events during the past year

## January

- The winter began relatively calmly. The water situation was satisfactory and the price of electricity on the spot market was relatively low (about 33 öre/kWh). However the price in Germany was high, which was why a lot was exported.
- The highest hourly power consumption of the winter occurred on 19 January and amounted to 26,300 MW.
- In a letter to Energinet.dk, the Danish company with system responsibility, Svenska Kraftnät offered the possibility of setting up a joint price area for Sweden and Zealand using counter trading. This would facilitate the elimination of the high spot market prices that occasionally arise on Zealand as a result of insufficient competition in the electricity market. One precondition was that the costs for counter trading should be shared between Energinet.dk and Svenska Kraftnät. However, such a solution was declined from the Danish side.

## February

- The Board of Svenska Kraftnät adopted the decision to invest in a new main supply to Lidingö, outside Stockholm.

## March

- The start of the month was the coldest for 25 years and consumption was unusually high for the time of year. Electricity prices on the spot market were high, peaking at approx. 130 öre/kWh. Svenska Kraftnät took a number of measures to ensure the operation of the electricity supply system. For example, work on a number of powerlines was cancelled.

- The annual meeting was held on 23 March, at which Svenska Kraftnät's customers and stakeholders were given an account of the previous year. They were also given a presentation of the environmental work and a historic retrospective of the Swedish gas industry.

## April

- Svenska Kraftnät submitted a report to the government regarding management of the peak power situation after the winter of 2007-2008, at which time the temporary power reserve act comes to an end. The proposal is based on operators in the industry taking periodic responsibility for maintaining a power reserve through Swedenergy.

## May

- Svenska Kraftnät organised two large customer meetings during the month. On 10 May, 150 persons participated in a conference on the Ediel communication system. On 17 May, the annual information day was held for balance providers.

## June

- On six occasions during the summer the powerlines in the national grid were hit by tree-faults – i.e. electrical flash-overs between live lines and nearby trees – during an extremely hot period in early July, among others. In several instances it involved areas where clearance of powerline corridors was underway or was to commence. In conjunction with our contractors we are now reviewing the clearance plans in order to reduce the risk of such faults in the future.
- At a ceremony at the Åre Design Centre

on 29 June the winner of the competition for Sweden's first artistically designed pylon was announced. The pylon, which is to be located at the entrance to Åre, is part of the new 400 kV powerline between Järpströmmen and the Norwegian border. Anna Cronheden, an artist who lives and works in Åre, received the commission to design the pylon.

- Svenska Kraftnät was co-organiser of an international conference at the Royal Institute of Technology in Stockholm on the theme of probabilistic (statistic) methods for planning of expansion, operation and maintenance of the electricity supply system.

## July

- In July the Danish trade organisation, Dansk Energi, submitted a "report" to the EU Commission on Svenska Kraftnät's handling of congestion in the national grid. Danish operators consider that non-delivery of imports from Sweden – that can be the result of congestion in the Swedish transmission network – sometimes contribute to very high prices on the spot market in Denmark.
- As the issue of dealing with congestion is the subject of extensive discussions in the Nordel collaborative organisation and elsewhere, Svenska Kraftnät has initiated a major Swedish study on how congestion should be dealt with in the future in the Nordic region, in particular in Sweden. The study is conducted together with the Energy Markets Inspectorate, Swedenergy and the Confederation of Swedish Enterprise and is expected to submit its report in spring 2007.



Fenno-Skan, the DC connection between Sweden and Finland, is to be developed. Svenska Kraftnät will provide information about the actual plans at a consultation meeting in Northern Uppland.

### August

- After the year's supplementary procurement of the power reserve for the winter, the overall cost was SEK 130.6 million, which is about 16 % less than the previous year. The power reserve comprises a total of 1989 MW, of which 564 MW consists of reductions in industrial consumption and the rest is production plants that are not normally on the market.
- At its meeting on the 30 August the Board of Svenska Kraftnät decided that the national grid tariff for 2007 should be unchanged in comparison with 2006. The Board also adopted a decision on investing in a new switching station and redirection of a powerline in Uppsala.
- As a consequence of the warm, dry summer, levels in Nordic hydro electric reservoirs were very low at the end of the summer. The shortage was about 30 TWh in comparison with the average level for the time of year.
- As a consequence, electricity prices were at record levels during the late summer, on average, twice as high as the previous year. However, prices gradually decreased during the autumn as the rain replenished the reservoirs.

### September

- On 22 September a new switchyard in Stenkullen was commissioned as replacement for a plant dating from the 1950s.

### October

- On 4 October Svenska Kraftnät presented the pilot study for the Southern Link – a

national grid powerline that is planned between Hallsberg and Malmö – at a consultation meeting in Jönköping for some sixty invited local authorities and county administrative boards. The pilot study describes a total of four alternative main routes for two technical options, a 400 kV AC overhead powerline, and a buried 300 kV DC cable.

### November

- On 4 November there was a major power failure in continental Europe. As a result there was surplus generation in Jutland which was "taken care of" by Sweden and Norway increasing their imports.
- At the board meeting of 23 November six investment matters were dealt with. These included a decision on a new 400 kV line, Hagby–Danderyd, which will partially run through a tunnel. The line is an important part of the Stockholms Ström project, for more secure electricity supply in Stockholm.

### December

- The Fenno-Skan DC link between Sweden and Finland was interrupted after a breakdown on 2 December. The damage to the cable took place about 8 km off the coast of Finland. After being repaired it was possible to bring the cable back into operation in mid-February.
- On the Friday before Christmas, the contractor handed over the new station in Lindome for the modernised Konti-Skan 1 DC connection to Svenska Kraftnät. Energinet.dk simultaneously commis-

sioned the corresponding station in Vester Hassing on the Danish side. Work will be completed during 2007, including upgrading of the control and monitoring system.

- Licence applications were submitted for the expanded DC connection to Finland, Fenno-Skan, and for the Swedish part of the 400 kV line between Järpströmmen and Nea in Norway.
- After a mild and rainy autumn and early winter, the reservoirs had recovered by the end of the year and the price of electricity on the spot market had decreased to the lowest level of the year, 29 öre/kWh compared with 71 öre at the end of August.

## A word from the chairman

Svenska Kraftnät's activities are now clearly beginning to be affected by the extensive investments that lie before us. From having been at an annual rate of half a billion kronor for a long period, annual investment will be over a billion kronor for several years to come. The driving forces in this development are both an endeavour to improve the preconditions for the Nordic electricity trade and the decision to further increase the level of reliability in the national grid after the power failure in September 2003. During the next five year period Svenska Kraftnät will to a large degree be characterised by this substantial investment programme.

The Stockholms Ström project, which started with a Government Commission a few years ago, is now progressing towards an implementation stage. Even though the forms of financing etc. are not yet entirely in place, the Board has adopted decisions on a number of investments that are part of Stockholms Ström. Here too we anticipate a substantial increase in activity during the coming years in which the main elements involved in restructuring Stockholm's electricity supply are to be implemented. These include a 400 kV powerline in a tunnel underneath Stockholm. The city will subsequently be supplied with electricity through



Sven Hulterström, Chairman of Svenska Kraftnät's Board.

a 400 kV ring, which is advantageous from a reliability perspective.

The driving force behind Stockholms Ström is to a large degree environmental. When the project is completed, not only has a robust and secure electricity supply system for the capital been created, but in addition it has been possible to remove approx. 15 kilometres of power transmission lines. Powerlines will thereby have been cleared from some 60,000 people who currently have powerlines at close proximity. The project

is accordingly thoroughly consistent with Svenska Kraftnät's environmental profile.

Svenska Kraftnät has had system responsibility for natural gas in Sweden since 1 July 2005. In this capacity it was a pleasure for us to take part in the opening of the gas-fired combined power and heating plant in Göteborg in November. This is the first time in many years that a large new power station has been completed in Sweden.

The work of the Board during the year has largely been characterised by investment decisions. As is customary, during the autumn the Board also held a special meeting on strategic development at which there were reports and discussions on, among other things, the expansion of wind power and its consequences for Svenska Kraftnät, the criteria for selection of overhead lines and underground cables respectively, Svenska Kraftnät's magnetic field policy which was tightened up during the year, and the company's tele- and data communications strategy including IT security issues.

*Stockholm, February 2007*  
*Sven Hulterström*

# Director General's statement

## A responsible company

There have always been companies that behave responsibly: that have had a long-term perspective, have protected the environment, sought constructive solutions together with customers and stakeholders, generated stimulation and development for employees etc. In recent years "Corporate Social Responsibility", CSR, has taken on a more well-defined meaning.

Svenska Kraftnät has a solid ambition to be such a responsible company as, among other reasons, our operation is extremely important to society and is long-term in character.

We have been increasingly emphasising the environmental aspects of our work in a number of ways including supporting good environmental development, adopting a strict magnetic field policy and by placing a higher level of environmental requirements on our subcontractors. During 2006 we also decided to establish Svenska Kraftnät's environment prize, which will be awarded for the first time in March 2007.

## A varied year

2006 started with a large flow on the national grid in a southerly direction. A transmission pattern such as this increases Svenska Kraftnät's revenues. The financial result during the first quarter was also extremely good. However, the dry period during the summer and early autumn led to low levels in the reservoirs and a more varied transmission pattern. Towards the end of the year the situation changed again when the reservoirs filled up due to rain and mild weather. All in all, the financial result during the year was SEK 676 million, which is somewhat above the government's yield requirement for Svenska Kraftnät.

## Good reliability performance

Operationally, we have enjoyed a normal level of security in 2006. A number of operational situations have however required particular attention. A nuclear power unit has been at a standstill for almost six months. In early autumn further nuclear power units were closed for weeks at a time. During these periods the margins in the electricity system were adequate, which would not necessarily have been the case if so many shutdowns had occurred during a cold winter.

An east-west imbalance arose just before Christmas in the Swedish electricity system due to several nuclear power units in Oskarshamn and Forsmark being taken out of operation for a brief period at the same time as the DC connection with Finland, Fenno-Skan, was under repair after being damaged. It was possible to deal with the situation, but it required counter purchasing at a cost of approximately SEK 45 million over a period of several days.

## New peak power report

The highest electricity consumption of the year, 26,300 MW, took place on 19 January 2006. Very cold conditions in Finland meant that that day saw the hourly consumption record being broken there.

In a report to the government on 18 April, Svenska Kraftnät reported an analysis of the peak power situation after the winter of 2007/08 when the current temporary power reserve act comes to an end. The assessment is that a power reserve is needed for a few more years while waiting for,



Jan Magnusson, Director General.

among other things, better methods for controlling consumption to be developed. The electricity industry, via the trade association Swedenergy, thereby undertook to participate in the transition to industry operators taking responsibility for such a power reserve. The proposal is supported by Svenska Kraftnät as we deem it to be a step in the direction towards the market itself – with no state intervention – taking responsibility for security of power supply.

## Substantial increase in future investment

Investments in 2006 amounted to SEK 478 million, which is on a level with the annual investment level over a long period. However, we are now seeing a clear upswing in the investment volumes. Investments in 2007 are calculated to be approximately SEK 700 million and subsequently to be in excess of SEK 1000 per year for several years.

There are several reasons for the increased investment volumes: We are taking measures to increase transmission capacity to the benefit of the Nordic electricity market, as well as



The national grid powerlines for 400 kilovolts constitute the backbone of the Swedish electricity networks. It has been proved that powerline corridors can represent suitable habitats for some plants and insects. The picture shows a marsh fritillary butterfly, which thrives in the powerline corridors.

to further reinforce the reliability performance of the Swedish national grid. Several further projects are now being implemented within the framework of Stockholms Ström, i.e. the restructuring of Greater Stockholm's electricity supply that Svenska Kraftnät is carrying out for reasons of both reliability and the environment. In addition, in the future there will be an increased need for an expansion of the grid as a consequence of the major wind power projects that are planned.

2006 was the first full year of Svenska Kraftnät's natural gas operations. The task of being responsible for the natural gas system has taken shape with good cooperation from the industry. In terms of volume, the opera-

tion is a small part of Svenska Kraftnät and at present it is not possible to discern any substantial increase, e.g. through the Government taking a greater direct responsibility for the transmission operation for natural gas.

**I would like to take this opportunity to thank employees, customers and stakeholders**

A responsible company is careful to maintain good cooperation with its customers and stakeholders and to work actively to support the development of its staff. 2006 has been a good year in this respect too. We enjoy close cooperation with our customers and their organisations, as well as with the authorities.

The illustrations in this annual report are to a large degree derived from situations where this cooperation is developed.

Internally, among other things, work on skills transfer, gender equality and keep-fit activities have been at centre-stage in recent years.

A large part of Svenska Kraftnät's strength and capacity is generated through our knowledgeable and capable staff. I would like to thank you all for your first-class efforts during the past year.

*Stockholm, February 2007  
Jan Magnusson*



# The Svenska Kraftnät Group

## Subsidiaries

### **SwePol Link AB**

The task of the company is to operate and maintain a DC link between Sweden and Poland. The link is rated at 600 MW. SwePol Link AB owns the part of the link that is located on Swedish and international territory.

Svenska Kraftnät's shareholding in the company is 51 percent, Vattenfall AB owns 16 percent and the Polish national grid company Polskie Sieci Elektroenergetyczne SA owns 33 percent.

Group turnover in 2006: SEK 232 (231) million.

SwePol Link Poland Sp.zo.o. is a wholly-owned subsidiary of **SwePol Link AB**. The company owns that part of the DC link which runs through Polish territory.

Turnover in 2006: SEK 58 (55) million.

### **Svenska Kraftnät Gasturbiner AB**

The company is wholly-owned by Svenska Kraftnät. It was set up in 1999 so that Svenska Kraftnät could secure resources in the long term for dealing with disruptions in the power system.

Turnover in 2006: SEK 71 (66) million.

### **Svenska KraftKom AB**

The company is wholly-owned by Svenska Kraftnät. During 2006, as in 2003–2005, the company's operations were insignificant.

Turnover in 2006: SEK 0 (0) million

## Associated companies

### **Nord Pool ASA**

Nord Pool ASA is an exchange for financial trading for players on the Nordic electricity market. The Head Office is situated in Oslo and there are branch offices in Stockholm, Helsinki, Fredericia and Berlin. Nord Pool is also active on the European market, for instance, by owning 17 percent of the German electricity exchange EEX.

During 2006 trading on the futures market amounted to 765.9 (786.0) TWh. Clearing operations amounted to 2,160.3 (2,102) TWh.

Svenska Kraftnät owns 50 percent of Nord Pool ASA. The remaining 50 percent is owned by Statnett SF.

Turnover in 2006:  
NOK 327 (277) million.



SwePol Link AB owns the DC link between Sweden and Poland. Here we see representatives from Vattenfall AB and Svenska Kraftnät, two of the three owners of the company.

### **Nord Pool Spot AS**

The physical trading exchange for electricity, the spot market, is conducted via a separate company: Nord Pool Spot AS. During 2006 trading amounted to 249.9 (163.1) TWh.

The company is owned in equal shares by Svenska Kraftnät, Statnett SF, Nord Pool ASA, Fingrid Oyj and Energinet.dk

Turnover in 2006:  
NOK 96 (81) million.

### **Triangelbolaget D4 AB**

The company administers the fibre-optic links between Stockholm, Oslo, Göteborg, Malmö and Stockholm on behalf of its partners. Leasing revenues go directly to the partners.

The company is owned in equal shares by Svenska Kraftnät, Vattenfall AB, Fortum Distribution AB and Tele2 Syd AB.

Turnover in 2006: SEK 21 (23) million.

### **Kraftdragarna AB**

The primary task of Kraftdragarna AB is to provide preparedness on behalf of the owners for the transport of transformers, reactors and other heavy components that make up the electricity supply system.

Kraftdragarna AB cooperates with Statnett Transport AS to further strengthen the level of contingency preparedness for the transportation of replacement components. Svenska Kraftnät owns 50 %, Vattenfall AB 25 % and Vattenfall Regionnät AB 25 % of the company.

Turnover in 2006: SEK 32 (34) million.

### **STRI AB**

The company conducts research and development within the field of electrical power transmission, primarily on behalf of its partners.

Svenska Kraftnät owns 25 %, ABB AB 50 %, Statnett SF 12.5 % and Vattenfall AB 12.5 % of the company.

Turnover in 2006: SEK 64 (49) million.

### **Elforsk AB**

Elforsk conducts joint operations in the field of research and development (R&D) on behalf of the electrical power sector in Sweden.

Svenska Kraftnät is mainly involved within those areas that concern the transmission of electricity and the development of the electricity market. The most important centres of focus are environmental issues, maintenance and the renewal of plants, as well as the provision of support for postgraduate projects.

Svenska Kraftnät owns 25 % of the company and the remaining 75 % is owned by the trade association Swedenergy.

Turnover in 2006:  
SEK 119 (149) million.

# Report of the Board of Directors 2006

## Group operations and structure

Svenska Kraftnät's principal tasks are to administer and operate the national grid for electricity in Sweden, including the links with neighbouring countries, and to be the authority holding system responsibility pursuant to the Electricity Act, which involves being responsible for the ongoing instantaneous electricity balance and the overall operational reliability of the Swedish power system. Furthermore, Svenska Kraftnät is the authority responsible for natural gas in accordance with the Natural Gas Act and power contingency planning in accordance with the Power Contingency Act. Svenska Kraftnät also has official duties in connection with dam safety and renewable electricity certificates.

During 2006, the Svenska Kraftnät Group consisted of the public utility, three subsidiaries and six associated companies in Sweden and Norway.

### Financial goals

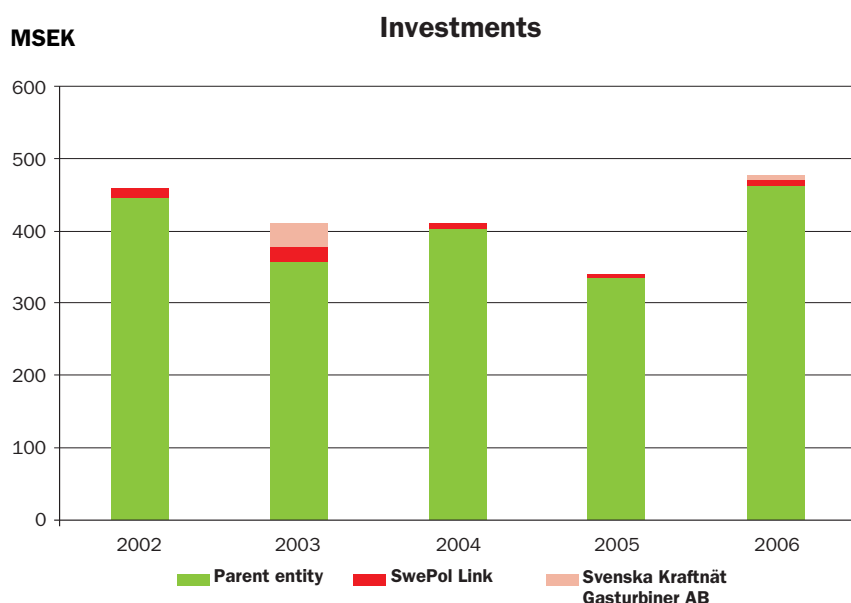
Svenska Kraftnät will achieve an average return on adjusted equity, following deduction for tax equivalence, of 6 %. The return on adjusted equity in 2006 was 7.9 (10.1) %, which means that the goal was exceeded.

The debt/equity ratio was 0.38 (0.22), which is in line with the goal of maximum 0.55.

The dividend policy is that 65 % of the net income for the year should be distributed to the Swedish state. Extra dividend may also be allocated.

### Investments

During the year investments made by the Group amounted to SEK 478 (338) million. See the graph and table to the right.



The investments are distributed as follows:

MSEK	2006	2005
<b>Parent entity</b>		
Investments in grid	367	208
Investments in fibre-optic cables	59	75
Leased fibre-optic connections	0	3
Intangible investments	36	49
<b>Total Parent entity</b>	<b>462</b>	<b>335</b>
<b>SwePol Link</b>	<b>10</b>	<b>1</b>
<b>Svenska Kraftnät Gasturbiner AB</b>	<b>6</b>	<b>2</b>
<b>Total</b>	<b>478</b>	<b>338</b>

One of the largest investments was the renewal of the DC link between the Swedish

West Coast and Jutland, amounting to SEK 28 (32) million. Other major investments during the year were the earth wire replacement and fibre-optic installation between Midskog and Tandö, amounting to SEK 27 (37) million, conversion of the switchyard at Stenkullen, SEK 51 (17) million, a new system transformer at Långbjörn, SEK 54 (5) million, and a new switchyard at Horred, SEK 57 (12) million.

### Operating revenue and net income

Group operating revenue increased by 16 % and amounted to SEK 6,838 million compared with SEK 5,885 million the previous year. The increase is primarily due to rising revenues for balance power, as a result of the higher market price of electricity during the year. Operating expenses amounted to SEK 6,150 (5,003) million. Costs for purchase of balance power during the year were SEK

1,180 million greater as a consequence of the higher electricity price in comparison with 2005.

Depreciation of intangible and tangible assets for the Group increased by SEK 11 million.

Group operating income amounted to SEK 736 million, which is SEK 176 million less than in 2005. The operating margin for the Group was 10.8 %, which is 4.7 percentage points less than the previous year.

Net financial income/expense during the year amounted to SEK -55 million, which is a deterioration of SEK 26 million in comparison with last year.

In accordance with a Government decision, on 31 January Svenska Kraftnät delivered an extra dividend of SEK 1,000 million.

The annual ordinary dividend of SEK 573 million based on last year's results was submitted in early June. The Group's borrowing requirements thereby increased, raising interest expenses by SEK 12 million. Exchange rate differences have also had a negative impact of SEK 10 million on net financial income/expense.

Net income for the year amounted to SEK 676 (880) million. The net profit margin, after a deduction for standard tax of 28 %, amounted to 7.1 %, which is a decrease of 3.7 percentage points compared with 2005.

### Financing

The parent entity finances its operations with equity and loans in the National Debt Office. At the end of 2006, loans amounted to SEK 709 (0) million and liquid funds to SEK 59 (232) million. Svenska Kraftnät has a variable loan parameter with the National Debt Office that can be utilised up to SEK 1,500 million.

The subsidiary, SwePol Link AB, has an agreement with Vattenfall AB for a loan of up to SEK 2,750 million. This loan will be redeemed in 2007 and replaced by a loan on the finance market. The Government has authorised the National Debt Office to furnish a guarantee for external loans that SwePol Link AB takes out up to SEK 1,000 million.

The level of borrowing in Svenska Kraftnät Gasturbiner AB decreased during the year from SEK 170 million to SEK 157 million. The financing takes place within the Group.

### Risk management

The Group's risks can be arranged under two categories: operationally related and financially related factors. The financial risk management takes place at Group level in accordance with the guidelines that are specified in the Group finance policy.



Five of the six trainees who started at Svenska Kraftnät in September 2006.

### Operational risks

Svenska Kraftnät operations are of central importance for the Swedish electricity supply. It must therefore be regarded as being of particular social importance in both the short and long terms. Operations can be subjected to disruptions and stresses of many different kinds. These may be a result of technical shortfalls or intentional actions aimed at causing damage. Certain factors may arise suddenly whereas others can be observed as slow processes in a certain direction that may subsequently have a negative impact on the operations. In a separate report, Svenska Kraftnät gives an overall account of risk and vulnerability analyses in accordance with Ordinance 2006:942.

Through everyday work and the competence of its staff, within the organisation there is a significant capacity to assess how risks and vulnerabilities are linked together. The work of further reinforcing this is continually in progress. Within certain areas it may need to be extended by greater business intelligence or be strengthened by means of external efforts. Different types of cooperation are also conducted in network form in order to gather experience from other areas, for example within the IT security area.

There is little risk of operational disruptions on the national grid, which would have serious consequences for the customers. The grid is powerfully structured with ample potential to maintain electricity supply even during disturbed operating conditions. However, the risk of a major power failure can never be totally eliminated. Svenska Kraftnät

is taking a series of measures, including an extensive investment programme, to further increase the performance reliability of the national grid.

The risk of peak power shortages in the Swedish electricity system has been limited since Svenska Kraftnät, as an interim measure, has procured standby power in accordance with the Limited Duration Act on Reserve Power (2003:436). The Act will cease to apply after winter 2007/08, after which there needs to be a new arrangement in place for maintaining sufficient resources.

### Financial risks

The use of the national grid is influenced by the hydrological situation, generation in thermal power plants and exports/ imports. In conjunction with large-scale hydro-power generation and resultant increased transmissions from Northern to Southern and Central Sweden, Svenska Kraftnät's income increases.

On the other hand, income from the national grid decreases when hydro power supplies are low and imports from the south are high. The fluctuations in results may as a consequence amount to several hundred million SEK. Assessment of Svenska Kraftnät's results must therefore apply to the average conditions over a period of several years.

Congestion arises in the Nordic electricity market when the demand to transmit electricity on the grid is greater than the transmission capacity. The extent of the congestion varies due to the flow on the grid. Congestion lead to revenues, which come



Svenska Kraftnät produces an environmental impact assessment for every large powerline or station project. The contents are presented at consultation meetings to which concerned land owners and nearby residents, among others, are invited.

about on account of differing electricity prices in the price areas on different sides of a bottleneck. These revenues go to the Nordic national grid companies in accordance with an agreed distribution quota.

Counter trading is sometimes used in order to reduce the transmission of electricity in a section of the grid where there is a limited transmission capacity. Counter trading means that the customers do not notice this congestion. The costs for counter trading are normally low in a properly developed national grid. However, counter trade expenses can amount to tens of millions of kronor in extreme operational situations, e.g. such as occurred in December 2006 when several nuclear power stations were out of operation.

Svenska Kraftnät has expenses for primary regulation to maintain the frequency in the grid. The size of the expenses are dependent on water supply in the reservoirs and on the price of electricity. In certain situations these expenses can double compared with normal conditions.

The development of Svenska Kraftnät's fibre-optic network has continued at a slower pace over the past year and has primarily been focused on the needs of the national grid. There are consequently no significant commercial risks.

The ETSO model for transit compensation that is also applied to Svenska Kraftnät since 2004, influences the financial outcome. If the flow of electricity through Sweden is high, Svenska Kraftnät receives income, but at the same time Swedish exports and imports cause flows through Denmark and neighbouring countries, incurring costs for Svenska Kraftnät. The model that is currently applied normally results in a net expense for national grid companies that, like Svenska Kraftnät, have low grid charges. In 2006 this net expense amounted to SEK 3 million, and last year to SEK 19 million.

Differences are primarily due to a one-off effect of SEK 10 million that arose in early 2006.

#### *Customers*

The customers consist mainly of well-established and stable companies with a high level of solvency. Altogether, Svenska Kraftnät has some 100 customers, the ten largest of which account for 75 % of the turnover. This means that Svenska Kraftnät has a sound distribution of commercial risks.

#### *Investments*

Over the coming five-year period Svenska Kraftnät has a substantial investment requirement. In conjunction with the other Nordic national grid companies, a programme of investments was presented in spring 2004 to strengthen the Nordic high-voltage network for electricity. The intention is that the investments will increase the security of the electricity supply and further improve the function of the Nordic electricity market. The programme includes the following five projects in the Nordic power network:

- Fenno-Skan 2 between Sweden and Finland
- Nea-Järpströmmen between Norway and Sweden
- The Southern Link between Central and Southern Sweden
- The Great Belt Link in Denmark
- Skagerak 4 between Norway and Denmark

The total investment cost amounts to approximately SEK 10 billion, which will have an impact on the the group's financing and interest expenses. The expansions are estimated to be completed around 2011.

Those factors that could have a significant impact on the consolidated result, apart from the hydrological situation, are linked with electricity prices and currency exchange rates.

#### *Currency exposure*

Through its international operations, Svenska Kraftnät is to some extent exposed to exchange risks in connection with the conversion of foreign assets and results. Svenska Kraftnät has not hedged its receivables and liabilities in foreign currency. The amounts involved are moderate in size and do not affect the financial result to any great extent.

#### *Interest exposure*

Interest risks in connection with liquidity and liability management are low, since Svenska Kraftnät's equity/assets ratio is high and its borrowing volume small.

#### *Electricity prices*

Svenska Kraftnät purchases electricity in order to cover the transmission losses at a fixed price in accordance with multi-year agreements. The volatility in the electricity price affects revenues and expenses for purchases and sold balance power within the System responsibility for electricity business segment, however there is a limited effect on the result.

#### *Credit risks*

The customers consist of well-established and stable companies with a high level of solvency. System responsibility for electricity and gas includes Svenska Kraftnät being responsible for the national balance settlement for those companies that are balance providers. In order to decrease the credit risk that arises, Svenska Kraftnät requires financial security from those companies that are balance providers.

#### **Other risks**

##### *Environment*

Svenska Kraftnät works very actively with environmental issues. For a number of years Svenska Kraftnät has had an environmental management system for construction activities based on the environmental management standard ISO 14001. The environmental management system is an aid in structuring and organising environmental work. Established routines provide a guarantee that the environmental work is performed efficiently and effectively. Follow-ups of the work are resulting in a constant decrease in the environmental impact of the operations.

## Business segments

### Network

The Network business segment comprises the construction, maintenance and operation of the national grid in Sweden, which consists of 220 kV and 400 kV lines with stations and foreign links administered by Svenska Kraftnät, including SwePol Link.

The national grid fees account for most of the transmission income. The tariff consists of a power component and an energy component. The power component is based on the power subscribed to by the customer on an annual basis for input and outtake at each connection point. The input fee is SEK 5/kW in the south and increases linearly with latitude to SEK 25/kW in the north. The outtake fee is SEK 47/kW in the south decreasing linearly with latitude to SEK 11/kW in the north. The energy component is based on the grid losses that are occasioned by supply and extraction at the individual connection points. Decreased losses involve corresponding crediting.

Other income centres are congestion fees and transit income. Congestion income is generated when the Nordic market is divided up into different price areas. Transit income consists of reimbursement for costs of electricity flowing through the national grid with its points of origin in other countries.

### Income for Network operations

Due to the mild autumn, transmissions on the national grid have been less than normal. This has an impact on both income and transmission losses. The grid fees generated a total of SEK 2,307 (2,449) million. Of these, the power fees accounted for approximately 47 % and the energy fees for some 53 %. An account is given below of the income from Network operations. Congestion revenues on the Nordic market have decreased somewhat compared with 2005 when they were higher than normal.

Network revenue, MSEK		
	2006	2005
<b>National grid fees</b>		
Power fees	1 074	1 071
Energy fees	1 233	1 378
<b>Total</b>	<b>2 307</b>	<b>2 449</b>
Congestion income	320	413
Transit income	139	136
Transmission via		
SwePol Link	232	225
Other network income	52	60
<b>Grand total</b>	<b>3 050</b>	<b>3 283</b>

Congestion revenues were used for investments that were made in order to achieve



The national grid is monitored from our control centres in Räcksta and Sollefteå. The work of the systems operators requires a large number of contacts with other companies' control centres.

capacity increases in the national grid.

Transit revenues amounted to SEK 139 (136) million, whereas the costs for the transit transmission we incur in other ETSO countries were at SEK 142 (155) million. This represents a net cost for the transit of SEK 3 (19) million.

### Transmission via the national grid and energy losses

During the course of the year, transmission has amounted to 117.3 (124.5) TWh. Input and extraction subscription fees are at the same level as 2005. The number of customers connected to the national grid was 21 (21).

Power transmission 2006 2005		
<b>Power subscribed to on the national grid</b>		
Input		
subscription, MW	20 404	20 576
Extract		
subscription, MW	21 554	21 529
Energy fed into the national grid, TWh	119.8	127.7
Energy extracted from the national grid, TWh	117.3	124.5
Max. power outtake from the national grid, GW	20.0	19.8

As a consequence of the reduced transmission, the transmission losses on the national grid have decreased and the expenses amounted to SEK 698 (860) million.

Transmission losses national grid		
	2006	2005
Energy losses, TWh	2.5	3.2
Percentage of extracted energy, %	2.6	2.2
Maximum power losses, MWh/h (hour with highest energy losses)	806	715

Financial development for the Network business segment is shown below in a compressed income statement.

MSEK	2006	2005
Operating revenue	3 074	3 308
Operating expenses	-2 397	-2 507
<b>Operating income</b>	<b>677</b>	<b>801</b>

Operating income decreased by SEK 234 million compared with last year, which is primarily due to a lower level of energy revenues and congestion revenues. Operating income amounted to SEK 677 million, which is SEK 124 million less than last year. Operating margin was 22.0 %, which is 2.2 percentage points lower than 2005.

### Reliability performance

Svenska Kraftnät's principal goal is a high level of reliability performance in the Network operation. Reliability performance has been good. The number of operational disturbances in the grid was 181, most of which were dealt with by the automatic equipment built into the technical systems without having any impact on power supplies.

Those disturbances in the national grid that were not dealt with successfully have only resulted in small volumes of non-supplied energy.

Fifteen disturbances led to power failures for subscribers. The volume of energy that was not supplied amounted to 95 MWh. The single largest loss, 60 MWh, took place in a switchyard in the vicinity of Avesta on 28 June after a flashover between a powerline and vegetation. On 19 July there was a loss of 30 MWh in Sveg due to a fire in a voltage transformer. Most of the disturbances were a consequence of extensive thunderstorms during the summer. The adjacent table shows operational disturbances in the national grid over a five-year period.

After the major disruption that took place in September 2003, Svenska Kraftnät decided to initiate a reconstruction programme for the 400 kV stations in the national grid. This work is underway and during 2006 the decision was taken to renew the Ramsale, Strömme and Forsmark stations.

Another project that was initiated after the 2003 disruption was to build a new powerline between Hallsberg and Hörby, the Southern Link. The work of implementing this project is in progress and during 2006 enquiries into possible corridors for the various technical options have been carried out.

During 2005 Svenska Kraftnät commenced a programme for replacing the oldest type of earth wires on the powerlines with the aim of raising performance reliability and personnel safety. The work has continued during 2006 and will be underway for a number of years to come.

To increase reliability in the supply to the Göteborg area, in connection with the reconstruction of the DC link to Denmark, Svenska Kraftnät decided to build a new 400 kV powerline in the powerline corridor for the previous DC powerline between the coast and Stenkullen, east of Göteborg. The concession has not yet been received, and work on permit issues has been proceeding during 2006.

The aim of the Stockholms Ström project is to improve the provision, reliability and environmental conditions for Stockholm's electricity supply. The decision was taken in 2006 to implement the first sub-projects.

Uppsala Ström is another project with the aim, among others, of increasing reliability. The project started during 2006 and is a collaborative venture between Svenska Kraftnät, the municipality of Uppsala and Vattenfall Eldistribution AB.

#### Land compensation

SEK 233,386 has been paid in land compensation for permanent damage during 2006. 15 properties have received compensation. Compensation has varied between SEK 2,000 and 110,000.

Operational disturbances	2006	2005	2004	2003	2002
Operational disturbances on the grid, no.	181	251	187	198	293
Ditto with loss of supply, no.	15	22	10	27	23
Non-supplied energy, MWh	95	4	25	10 400	49

On average the compensation was some SEK 15,000. The bulk of the cases (nine) have involved conversion of powerlines around Ljusdal. The relatively low level of compensation in 2006 is due to the fact that no major claim settlements have taken place.

#### Connection of renewable electricity generation

Svenska Kraftnät has published written procedures on its website for dealing with matters concerning connection of new production, chiefly wind power. During the year Svenska Kraftnät has been involved in a number of enquiries and studies to facilitate new connections. There are a number of examples below.

##### External work

- Requirements and guidelines from network owners for production plants that are to be connected, primarily groups of wind turbines, greater than 25 MW. The work has been led by Elforsk in conjunction with Swedenergy. Svenska Kraftnät has been part of the reference group.
- Vindforsk is a programme for basic and applied research into wind power.
- Nordic energy research. Development of models of wind power for simulation tools.
- European Wind Integration Study. Analysis of consequences of integrating wind power for the Nordic power system. The work is being conducted within the collaborative Nordic organisation, Nordel.

Svenska Kraftnät's regulations on the technical reliability design of production facilities come into force on 1 January 2006. The regulations stipulate the technical requirements that the facilities, including wind turbines, have to meet. On the Nordic level, during the year common minimum technical requirements for wind power have also been drawn up by Nordel. The aim is to make things simpler for manufacturers and wind power planners during design and procurement respectively.

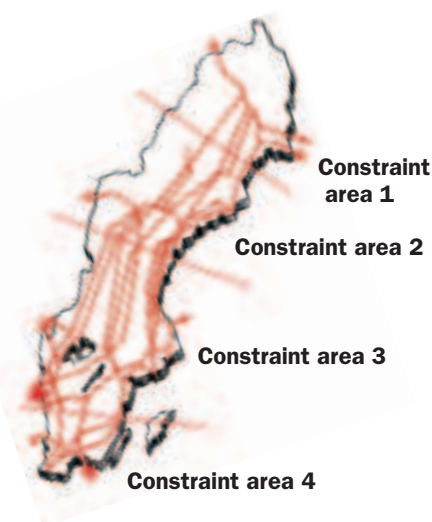
##### Internal work

An enquiry is being conducted as to how a major increase in wind power in South Sweden will affect the network in 2010. An enquiry is also underway on the transmission capacity between North and South Sweden.

Svenska Kraftnät has instigated or participated in a number of consultation meetings

with wind power companies. During 2006 the meetings have concerned the following projects:

- Baltic Wind Link. Link to Germany with the connection of Kriegers Flak wind power park on the way. Preparatory pilot study completed in conjunction with Vattenfall AB.
- Connection of Stora Middelgrund wind power park, Kattegatt, 880 MW. Network survey completed.
- Connection of Bleikevare (Dorotea) and Glötesvålen (Härjedalen) wind power parks, 60 + 90 MW. Network surveys have been completed.
- Connection of Havsnäs wind power park, Ala-vattnet, Jämtland, 96 MW. Network survey completed.
- Connection of Finngrunden wind power park in Gävlebukten, 1,050 MW.
- Connection of Markbygden wind power plant outside Piteå, 1,000 – 5,000 MW.
- Dong Energy, Denmark. Connection of Storrun wind power park, Krokoms municipality, Jämtland, 30 MW. Network survey completed.
- Connection of Kriegers Flak wind power park in the south of the Baltic Sea, 640 MW, with VSC HVDC technology for the connection. Network survey completed.
- Baltic Wind Link. Network survey under referral.



The national grid comprises 15,000 km of powerlines and is divided into four constraint areas. 135 switchyards are also part of the national grid.

**System responsibility – electricity**

System Responsibility for electricity incorporates, above all, activities for regulation of the country's electricity balance (frequency control) and settlement of the imbalances of those operators who are balance providers. System Responsibility includes the balance service, Ediel and also, during a transitional period, the power reserve. The core of System Responsibility is the task of balancing, in the short term, the national generation and consumption of electricity. This is dealt with by Svenska Kraftnät's Balance Service, which is manned round the clock.

At the end of 2006 Svenska Kraftnät had agreements with 30 balance providers. The companies have undertaken to plan for balance between their input of electricity (generation and purchase) and their extraction (consumption and sale) for each hour. Svenska Kraftnät then conducts a balance settlement, or in other words performs a financial settlement of the imbalances. The difference between purchased and sold balance power amounted to SEK 212 (194) million. Further expenses that are attributed to the System Responsibility business segment are the expenses associated with the automatic reserves (referred to as primary regulation), that are utilised to maintain the frequency in the network, and the staff expenses related to system responsibility.

According to the Power Reserve Act, Svenska Kraftnät is responsible for ensuring that reserve power of at most 2,000 MW is available during the winter. The Act applies up to and including February 2008. This reserve shall contribute towards covering



The electricity system is in balance when the frequency is 50 Hz. Svenska Kraftnät's Balance Service monitors the frequency, maintains the instantaneous electricity balance, deals with congestion in transmission and distributes the expenses between balance providers.

consumption during extreme situations that can occur during the winter when normal power production is insufficient. Svenska Kraftnät therefore conducts annual procurements for the purpose of meeting this requirement. During the 2006/2007 winter the power reserve amounted to 1,994 MW. Just over a quarter of this (564 MW)

consists of a reduction in consumption. The reserve power is financed by a special fee that is paid by the balance providers. The cost of the power reserve decreased by 16 % in 2006 compared with the previous year, which meant that it was possible to reduce the fee for financing the power reserve. Since this activity shall, over the years, be neutral as regards income, the surplus from winter 2005/2006 was paid out to the balance providers at the end of 2006.

The players on the electricity market have agreements with Svenska Kraftnät regarding Ediel communication. The net expense for Ediel amounted to SEK 0 (-1) million.

The financial result for the business segment System Responsibility for electricity was:

MSEK	2006	2005
Operating revenue	3 388	2 226
Operating expenses	-3 429	-2 170
<b>Operating income</b>	<b>-41</b>	<b>56</b>

Operating income amounted to SEK -41 (56) million. The lower earnings are due to higher expenses for primary regulation which amounted to SEK 205 (95) million. In its turn this is due to the high price of electricity during the year. The operating margin was -1.2 %, which is a deterioration of 3.7 percentage points compared with last year. The financial result should be assessed as an average over a period of several years. Further information is available in note 8.



Once a year the balance providers are invited to attend a meeting to discuss the regulations for balance responsibility.



Svenska Kraftnät monitors its own telecommunications network, Drifftelenätet, which has to deal with availability requirements set at a very high level.

## Telecommunications

Svenska Kraftnät has a nationwide telecommunications network extending from Malmö in the south to Ritsem in the north to monitor and control the national grid.

The older parts of this network are based on powerline carrier and on radio link connections. In 1994, a fibre-optic network was installed in the powerline earth wires. The installation comprises approximately 6,000 km of own fibre-optic cables and some 2,500 km of leased fibre-optic cables from other network players.

Svenska Kraftnät operates a telecom network on the fibre-optic network with a platform that is based on modern technology with high capacity and good reliability performance. The telecom network is an important element in the restoration after a potential major disturbance in the country's electricity supply. In order to guarantee reliable operation, the telecom network is provided with a reserve system in the form of batteries and diesel generators. Telecom traffic is being successively shifted from older to more modern technology as the building of the fibre-optic network gradually progresses.

The high capacity of the telecom network means that it is possible to lease network capacity to external customers. Svenska Kraftnät hires out black fibre (optical fibre without physical terminus equipment) to, for example, telecom operators. Furthermore, active connections are hired out in the form of capacity to, primarily, energy companies.

During 2006 the following fibre-optic power cables have been installed: on the Midskog (Östersund) – Borgvik (Karlstad) line, the first sub-section Midskog – Sveg was built during 2005 and the remaining part from Sveg – Borgvik was completed during 2006. During the year the Ånge – Rätan transverse link which is located on the Midskog – Sveg line was also built, the stretch from Sollefteå via Örnsköldsvik to Umeå and also the Ringhals – Horred stretch.

During 2006 connections on leased fibre-optic cables were put into operation to replace older carrier frequency and radio link equipment to thereby strengthen the reliability performance of the operational telephone network. In Northern Sweden the connections between Jokkmokk – Vuollerim – Boden – Luleå – Skellefteå – Umeå – Norrtjärn were strengthened. On the West Coast, reinforcements have been undertaken on the connection between Göteborg – Falkenberg – Halmstad – Malmö. In the Stockholm area connections between a number of plants were similarly strengthened.

Operating income consists partly of revenues from external customers for leasing black fibre and active connections, partly of internal revenues (calculated according to a standard) from the Network business segment.

The revenue earned on commercial fibre-optic operations amounted to 56 (51) million and the operating income was SEK 26 (13) million. The improved result in comparison with last year is partly due to a number of new customers, partly due to a

depreciation of fixed assets of SEK 7 million in 2005. With a calculated interest of 7 % on employed capital, the operating profit for the financial year was SEK 19 (4) million. Investments within fibre-optic operations for the year amounted to SEK 59 (78) million.

Within the Telecommunications segment, Svenska Kraftnät has additional external revenue amounting to SEK 14 (14) million for the leasing of data networks, telephone networks and antenna space.

The total revenue for Telecommunications was SEK 99 (98) million. Included in this is SEK 32 (32) million in internal revenues from the Network business segment. Operating income amounted to SEK 31 (18) million. The improvement to operating income is explained by lower maintenance expenses and the above mentioned depreciation of fixed assets last year of SEK 7 million.

MSEK	2006	2005
Operating revenue	99	98
Operating expenses	-68	-80
<b>Operating income</b>	<b>31</b>	<b>18</b>





Nord Pool, the Nordic electricity exchange is owned by the companies with system responsibility in Sweden, Norway, Denmark and Finland.

### System responsibility – natural gas

Svenska Kraftnät took on system responsibility for natural gas in Sweden on 1 July 2005 in connection with the new Natural Gas Act coming into force. Among other things, the commission means that Svenska Kraftnät is responsible that there is a balance between the incoming supply and the consumption of natural gas in Sweden. The gas lines are not owned by Svenska Kraftnät. There are five balance providers.

Operating revenue for 2006 amounted to SEK 36 (8) million while the operating expenses amounted to SEK 29 (9) million. Operating income thereby amounted to SEK 7 (-1) million. The deficit last year is a consequence of the fact that running costs for preparing operations were incurred some time before the operations actually started and revenue could be generated.



The Swedish natural gas network.  
Source: Swedish Gas Association

MSEK	2006	2005
Operating revenue	36	8
Operating expenses	-29	-9
<b>Operating income</b>	<b>7</b>	<b>1</b>

### Renewable electricity certificates

Sweden introduced an electricity certificates system in 2003 to promote renewable electricity generation. The Act gives producers of renewable electricity the opportunity to receive one electricity certificate per MWh of electricity generated. The certificates can be sold to electricity suppliers/electricity consumers, who are bound to purchase electricity certificates corresponding to a certain proportion of their sales/consumption.

MSEK	2006	2005
Operating revenue	20	18
Operating expenses	-6	-10
<b>Operating income</b>	<b>14</b>	<b>8</b>

Svenska Kraftnät is responsible for issuing and accounting for electricity certificates. The Swedish Energy Agency is responsible for other official tasks.

Svenska Kraftnät issued 11.9 (11.0) million electricity certificates during 2006. Since the introduction of the electricity certificate system some 40 million certificates have been issued. During 2006 the average price was SEK 191 (222) per certificate. Biofuel-fired electricity generation is predominant and during 2006 it accounted for 75 % of the electricity certificates issued, while hydro power accounted for 17 % and wind power for 8 %.

Operating revenue amounted to SEK 20 (18) million and was divided between account fees of SEK 19 (17) million and transmission charges of SEK 1 (1) million. Operating income for the business sector amounted to SEK 14 (8) million.

The extent of the fees and charges is determined by the Government. Fees and charges were lowered on 1 October 2006 on Svenska Kraftnät's proposal. The account fee was reduced from SEK 0.30 to 0.13 per certificate and the transmission charge of SEK 0.05 per certificate was removed altogether.

### Associated companies

Those associated companies in the Group that have had the greatest impact on Svenska Kraftnät's results are Nord Pool ASA, Nord Pool Spot AS and Kraftdragarna AB. Since they are associated companies, only Svenska Kraftnät's share of income in the respective companies is included in the consolidated profit. The share of income for 2006 amounted to SEK 48 million compared with SEK 30 million for 2005. The improved income is primarily a result of the fact that volumes and net income in Nord Pool ASA have increased compared with 2005.

Share of income in associated companies		
MSEK	2006	2005
Nord Pool ASA	36	24
Nord Pool Spot AS	10	5
Kraftdragarna AB	1	1
Others	1	0
<b>Total</b>	<b>48</b>	<b>30</b>

## Contingency planning

Contingency planning, consisting of electricity preparedness and dam safety, are financed through Government appropriations and grants from the Swedish Emergency Management Agency. In terms of the accounts, the activities are neutral for Svenska Kraftnät. During the year, a total of SEK 262.7 million was utilised for measures. These funds have principally been utilised for the purposes specified in Note 3.

During 2006, Svenska Kraftnät has held basic training for 59 conscripts in the repair of powerlines at the authority's training centre in Åsbro and for 64 conscripts in the repair of switchyards and power plant operators at Vattenfall Training Centre in Jokkmokk. A special group of 30 people from companies in the industry has been trained to be able to repair electrical installations in contaminated environments. During the year, some 300 individuals from the electricity sector have undergone training in crisis management for which Svenska Kraftnät has been responsible in cooperation with SwedEnergy.

**The facility at Åsbro** also serves as a warehouse for spare equipment for rapid repairs in connection with breakdowns in the national grid and regional networks. The equipment includes special pylons which can be assembled quickly and a number of standby power units. There are also complete sets of equipment for mobile repair crews that can be used for international help efforts.

Through agreements with the Swedish Armed Forces, various types of reinforcement can be added to deal with disruptions in the electricity supply. Among other things repair teams can be deployed by air. Through agreements with the voluntary defence organisations, human resources can be made available from the Voluntary Motor Transportation Corps, the Voluntary Motorcycle Corps, the Motor Transport Corps, the Voluntary Flying Corps and the Voluntary Radio Organization.

**The capacity of the electricity supply** to cope with critical situations has been strengthened in that control centres have been provided with greater physical protection, reinforced remote and speech communication and improved local power. The possibilities for maintaining necessary telecommunications have been improved through the acquisition of additional mobile command and communication units. During the course of the year, cooperation has been established between electricity and telecom companies with the aim of as far as possible securing critical telecommunications in the event of power failures. Due to the fact that the Rakel mobile telecommunications system has been opened to a wider circle of users than the so-called blue light authorities, the electricity supply in-



In the event of severe disruptions in the electricity supply it is important to get information out. Svenska Kraftnät and other network companies therefore collaborate, together with the Swedish Broadcasting Corporation, in creating functioning information channels.

dustry is set on using this system during both normal and abnormal conditions. Measures have been taken in a number of production plants, primarily combined heat and power plants, to safeguard their black-start capability, when there is no contact with the central electricity system, and to secure their island operation capability. The aim is to be able to supply urgent consumption under severe crisis conditions. This capability has been verified by means of testing. In connection with the tests, operating staff have been trained in running their installations with adjacent networks in island operation.

**Svenska Kraftnät collaborates** with Swedenergy's member companies in an emergency cooperation organisation consisting of seven electricity cooperation areas. The purpose of the organisation is to create a good conception of the situation and to coordinate repair resources in connection with extensive electricity failures with damaged plants. The information and reporting system Susie, which has been developed in order to support the cooperation organisation, has been further developed and placed at the disposal of authorities that have a need to follow the electricity supply situation in critical conditions. As was the case in the wake of Hurricane Gudrun in 2005, this collaboration has been activated in order to support repair work after the storm damage that occurred in January 2007.

Svenska Kraftnät also has a number of contingency tasks within natural gas supply. Work is taking place in cooperation with the Swedish Energy Agency to clarify the scope, financial requirements and demarcations within this area.

**In its role as** supervisory supporting authority for dam safety, Svenska Kraftnät is revising the instructive publication "Dam sa-

fety – self regulation and supervision", which will be issued as a manual during the first half of 2007. The training course for the country's river groups regarding the consequences of intervention in water regulation measures that was developed in 2005 has been held on two further occasions. The purpose of the course is to provide the participants with basic competence in assessing the technical and legal effects of intervention in connection with high water flows. An information brochure has been produced in cooperation with the Swedish Rescue Services Agency regarding supervision of dam safety and contingency planning for dam failures.

During the year, the work of contingency planning for dam failures has commenced in the following rivers: Lule, Ljungan, Dal and Göta. Dam owners, municipalities and county administrative boards are cooperating in the task of developing coordinated contingency planning for dam failures. Svenska Kraftnät is contributing some of the financing. A seminar for all the country's river groups with the effects of climate change as the main theme has been arranged together with the Swedish Rescue Services Agency.

**As a step in securing** knowledge and skills provision within the area of dam safety, Svenska Kraftnät has participated in the establishment of the Swedish Hydro Power Centre, a centre for support of university education and research within hydraulic engineering, water turbines and generators.

In its role as principal for the Flow Committee's guidelines for flow dimensioning dams, Svenska Kraftnät has participated in the work of producing a new edition of the guidelines. Together with the power industry Svenska Kraftnät has financed a sensitivity analysis of the Flow Committee's guidelines in a climate that has changed in the future.

## Research and development

Svenska Kraftnät's research and development activities aim at making the national grid and system responsibility operations even better with respect to reliability performance, efficiency and environmental adaptation. Development of knowledge and expertise in conjunction with the universities is also a prioritised area. Research and development is also supported within the area of dam safety as well as risk and vulnerability questions for the power system.

Svenska Kraftnät often undertakes research and development in collaboration with companies in the industry via the jointly owned Elforsk AB. Svenska Kraftnät is also joint owner of the development company Stri AB in Ludvika. Other co-owners are ABB, Statnett and Vattenfall. Research and development projects are often carried out in collaboration with the co-owners.

During 2006 there has been increased research and development cooperation between the Nordic national grid companies. Several new joint projects have started:

- Techniques and knowledge with regard to working under voltage on 220 and 400 kV powerlines.
- Development of a Nordic system for exchanging measured values in real time with time stamping. Several doctoral pro-

jects are underway at Nordic universities as to how this information should be used to increase exploitation of the Nordic national grids.

The decision was taken in 2006 regarding extensions of several years to a number of national research programmes in which Svenska Kraftnät participates:

- Elektra, university programme within applied electrotechnology. SEK 18 million/year in total (Svenska Kraftnät SEK 2.5 million/year).
- Market Design, research into the development of the electricity market. SEK 2 million/year in total (Svenska Kraftnät SEK 0.7 million/year).
- Centre of Electrical Power Engineering at the Royal Institute of Technology, KTH. SEK 18 million/year in total (Svenska Kraftnät SEK 0.7 million/year).

Svenska Kraftnät is also taking part with Swedish universities in several research projects at Nordic and European level concerning the impact of a change in the composition of electricity generation in the future. In particular a major introduction of small-scale electricity generation such as wind power and district heating is being studied.

Restoration of electricity supply after a major disruption requires that there is access to reserve power in the transformer stations and

control centres and for tele- and data communication. Svenska Kraftnät is currently testing fuel cell technology, based on hydrogen gas for this purpose. This would provide reserve power with a very small environmental impact compared with a source such as diesel generators.

Svenska Kraftnät also supports activities carried out at the Swedish Hydro Power Centre.

Dam safety is an important field in the Hydraulic Engineering sphere of competence. The safe administration of the country's aging stock of dams requires sound knowledge and competence within areas such as hydrology, hydraulics and dam construction technology.

Support has also been given to a number of research and development projects within dam safety, including two projects linked with climate issues, one for a sensitivity analysis of the guidelines for the flow dimensioning of dams in a changed climate and the other for a Nordic collaborative project on the impact of climate change on renewable energy sources, including hydro power.

During 2006, Svenska Kraftnät utilised SEK 27 (16) million for research and development within grid operations, including dam safety and contingency activities.



At the Department of Electrical Systems at the Royal Institute of Technology in Stockholm research is being carried out into electrical systems using techniques such as an electronic power simulator. Svenska Kraftnät contributes to funding the activities.

## Nordic and European cooperation

Nordel, the organisation of the Nordic transmission system operators, has focused its work on continued development of the Nordic electricity market. The aim is to promote increased competition and the effective utilisation of common generation resources. The Nordic electricity market shall be characterised by few borders and obstacles, enabling a well-functioning and effective trading with the surrounding world.

In April 2006 Nordel submitted a follow-up of its action plan for further development of the electricity market that was detailed in the so-called Akureyri Report the year previously.

**Activities are underway** within several areas. One concerns the possibilities of creating a common Nordic end-user market. At present there are considerable differences in the regulations for metering and settlement etc. between the Nordic countries. A common set of regulations would make matters easier in enabling electricity consumers to choose an electricity supplier from an optional Nordic country. It would also be easier for new operators to establish themselves, which could result in greater competition in the Nordic electricity market.

One of the preconditions for a common consumer market is that the rules on balance settlement are harmonised. In spring 2006 Nordel presented proposals on common rules for how expenses should be apportioned between the balance and grid businesses, and on principles for pricing imbalances.

The proposals have been welcomed by the market operators in the Nordic countries and the new rules will be introduced by transmission system operators in balance responsibility agreements from the start of 2009.

**Nordel is also** putting considerable emphasis on expanding the grid's capacity. The transmission system operators are currently engaged in implementing Nordel's five prioritised network extensions that were presented in 2005. Decisions have been taken during the year to build four of the five powerlines, namely Nea – Järpströmmen, Fenno-Skan 2, The Southern Link (Hallsberg – Skåne) and the Great Belt. The plan is that these powerlines will be put into operation between 2009 and 2011. An investment decision for the fifth project, Skagerak 4, is expected in spring 2007.

Work is currently underway in Nordel to develop a new Nordic expansion plan with proposals for further investments in the national grid that are significant for the Nordic electricity market. The new expansion plan will be presented in autumn 2007.

Another issue on Nordel's agenda concerns the management of transmission restrictions. The long-term goal is to manage congestion in electricity transmission in the Nordic countries so that trading is affected as little as possible. Reinforcements in the national grid create the preconditions for this. Nordel's ambition is also to agree on rules as to how transmission restrictions are to be handled in the short term. Nordel observed in its status report that there were differing opinions among the transmission system operators on available methods.

During the autumn Nordel has consequently analysed the advantages and disadvantages involved in two models. The first one entails the Nordic electricity market being divided up into additional price areas. This model would mean that Sweden is divided into two or three price areas. The second model entails transmission system operators reducing the risk of a division into price areas through increased counter trading. This would enable the number of price areas in the Nordic electricity market to be minimised and the price areas becoming larger, which is good from a competition point of view.

**The question of managing** transmission congestions in the Nordic electricity market is also being dealt with by Svenska Kraftnät in a joint project with the Energy Markets Inspectorate, Swedenergy and the Confederation of Swedish Enterprise. Factors behind the enquiry include the Energy Market Inspectorate's report *Competition in the electricity market*, spring 2006.

The report deals with the issue of dividing Sweden into several price areas. The Energy Market Inspectorate rejects a division of Sweden that would make constraint area four (South Sweden) into an individual price area, with reference to the fact that the competition situation would be inadequate in this price area. According to the report, a division of Sweden in the border between constraint areas two and three in Mid-Norrland could be possible under certain conditions.

A division of Sweden into several price areas would entail a substantial change for the operators in the market. The aim of the project that is currently underway is to analyze in depth the requirement and consequences of such a change. The project will present its findings in spring 2007.

**Nordic cooperation** within safety and preparedness activities has been further developed within the framework of the Nordic Electricity Preparedness and Safety Forum. Among the questions taken up as part of the cooperation are questions concerning how the Nordic countries can support each other during extensive and prolonged disruptions in electricity supply. Svenska Kraftnät is also involved in the European standardisation work within the area and in a planning committee within NATO and EAPC (Euro-Atlantic Partnership Council).

The work of ETSO, the European association of transmission system operators, has continued to be characterised in 2006 by the question of compensation for so-called transit flows. The ambition was to improve the model for calculating compensation. The EU Commission had announced that it would lay down binding guidelines for calculation of transit compensation during the year, which was also a motive for ETSO to develop the model. During the autumn



Nordel, the organisation for cooperation between the Nordic transmission companies, held its annual meeting in Fiskebäckskil.



The Nordic electricity market being discussed on the jetty in Fiskebäckskil.

it became clear that the EU Commission would not receive the decision data from the European supervisory agencies in time to issue the guidelines during the year. In December ETSO consequently decided to retain the current calculation model for a further period.

Extensive work has also taken place within ETSO to increase transparency in the European electricity market. Openness is a central condition for properly functioning price formation.

Svenska Kraftnät has also been involved in task forces within ETSO for balance regulation, reliability performance and power balance analyses.

**Since autumn 2006 the transmission system operators** are obliged to publish details of available trading capacity etc. in accordance with the EU Commission's congestion-management guidelines. In November 2006 ETSO launched a website, ETSO-Vista, where member companies publish these details. The Nordic grid companies have long been publishing this type of data on Nord Pool's website. Since November Nord Pool has been submitting data to ETSO-Vista. The information is thereby available for all the market's players simultaneously.

The European grid companies have been invited by the EU Commission and the European supervisory bodies to contribute

to the development of regional electricity markets in Europe. The Nordic transmission system operators are participating in such a project regarding the Northern European electricity market together with representatives for authorities and transmission system operators in Germany, Poland, Estonia, Latvia and Lithuania. Three focus areas have been identified: transparency, market links between the Nordic market and surrounding countries, and utilisation of so-called merchant links.

Svenska Kraftnät participates in the development of the European gas market in various ways, including as a member of Gas Infrastructure Europe.

#### **Nordel**

Nordel is an organisation for cooperation between the transmission system operators in the Nordic region. Companies from five countries are included.

More information is available at [www.nordel.org](http://www.nordel.org)

#### **ETSO**

ETSO (European Transmission System Operators) is an organisation for cooperation between transmission system operators in Europe. Companies from some 30 countries are included.

More information is available at [www.etso-net.org](http://www.etso-net.org)

## Environment

Environmental issues have long occupied a very important position in Svenska Kraftnät's operations. During 2006 consideration for the environment has been brought further to the forefront as an important goal for Svenska Kraftnät.

Environmental work is focused on long-term goals that are primarily linked to the national environmental quality objectives of a limited impact on climate, a non-toxic environment, a safe radiation environment, an acceptable environment in built up areas and a rich plant and animal life.

Svenska Kraftnät's long-term environmental goals are:

- Efficient energy use and a limited impact on climate
- Limited use and lowest possible emissions of hazardous substances
- A low level of encroachment from powerlines and stations
- Rich biological diversity in our powerline corridors

Our environmental policy includes emphasis on the following as guiding principles for the environmental work:

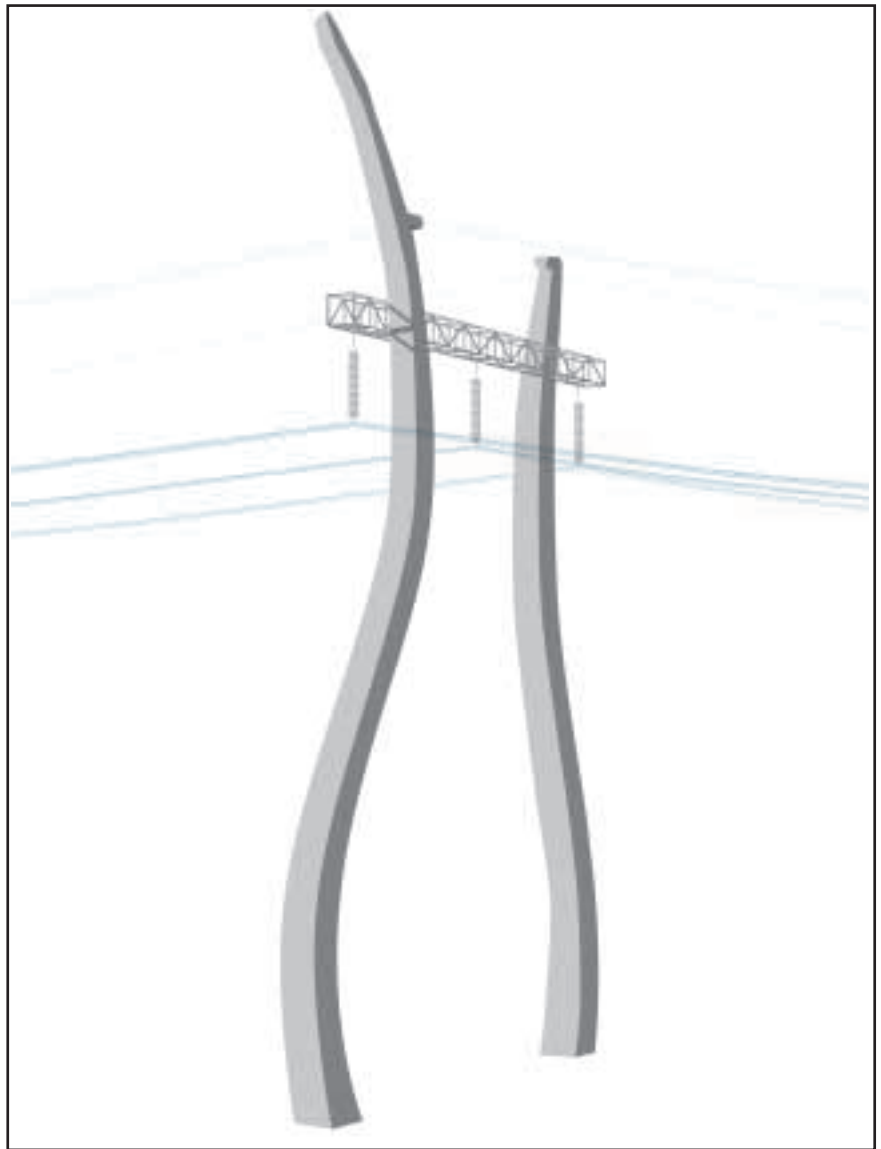
- We endeavour to continually reduce our environmental impact
- Environmental issues are integrated into activities, and consideration to the environment is weighed up in all decisions
- We set clear environmental targets and design procedures for following-up, evaluating and improving the environmental work
- We take account of environmental aspects in our procurements by setting environmental requirements for our suppliers and contractors

These principles have formed the basis for extensive work during the year with respect to the environmental requirements we place on construction and installation contracts.

### Measures and results during 2006

Svenska Kraftnät's environmental requirements on contractors have been updated. Checklists and other aids have been produced in order to facilitate the evaluation of tenders when procuring and following-up execution of contracts. Svenska Kraftnät's managers, project managers and other key persons have taken part in seminars concerning environmental requirements and their application in contracts. During 2007 a number of environmental audits will be carried out with the aim of checking that the environmental requirements are being observed.

There are a number of environmentally hazardous materials present in Svenska Kraftnät's plants, such as oils, heavy metals



The pylon with the motto "Asymmetrical togetherness – an attendant relationship" won the design competition. (Picture: Anna Cronheden)

and chemicals. We are dedicated to ensuring that these materials cause as little impact as possible on the environment. During 2006 a remedial programme has been drawn up to improve oil pits that are located underneath power transformers in the stations. The measures, which include enlarging some pits and improving alarm arrangements, will be implemented during 2007–2008. Several surveys have been carried out with the aim of increasing knowledge of how toxic substances from the plants are dispersed into the natural environment and how such dispersal can be avoided. A study has been made of how best to maintain ageing pylons painted with red lead paint. An investigation has been carried out into whether corrosion of copper from earth cables connected to powerlines affects the environment. It turned out that corrosion of copper makes a very minor contribution to the earth's natural copper content. At Åsbro training centre adjustments have been made to the procedures

for dealing with the chemicals that are used in the activities.

The maintenance operation carefully documents the amounts of SF<sub>6</sub> gas (sulphur hexafluoride gas), oil and cooling agents that are used in the facilities. Preventive environmental measures and incidents are logged. No emissions of SF<sub>6</sub> have occurred during the year as a result of breakdowns. However some emissions do occur due to leaks. Gas that has been used amounted to 27 kg, which is equivalent to 0.1 % of the installed amount. This value is in line with the values for 2003 and 2004 and considerably below the value for 2005. According to international standards new equipment is permitted to leak a maximum of 0.5 or 1.0 %. Measures to reduce abnormally large SF<sub>6</sub> leaks have been implemented at six units during the year.

Apart from a couple of minor oil spills from damaged voltage transformers, there have been no incidents involving oil. Decontamination of the oil after a spill takes place

immediately and the equipment and gravel mixed with oil is removed by a company engaged to do the clearance work.

The old HVDC converter station at Stenkullen has been demolished. Some 1.7 tonnes of liquid mercury from the ion valves as well as 100 tonnes of scrap steel contaminated with mercury have been dealt with.

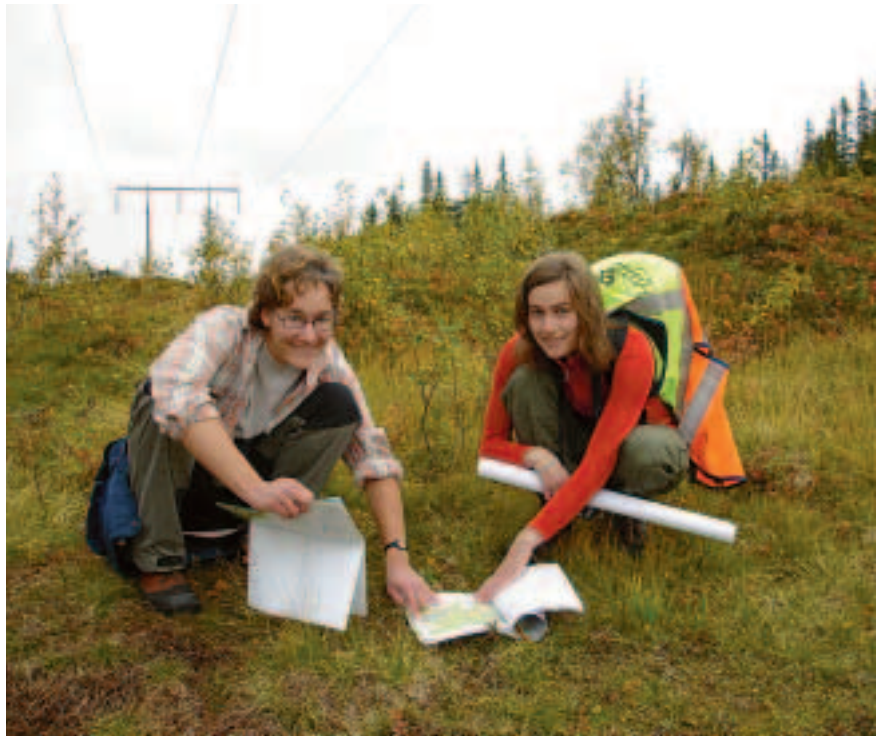
The energy losses in the national grid were 2.5 % during 2006. It is possible to influence a small proportion of these, the corona losses, through operational measures. We have reduced corona losses during 2006 by 2.6 GWh. A new tool for minimising losses from the network is estimated to produce an annual reduction of Svenska Kraftnät's energy losses of 1–2 %. A plan of remedial measures to reduce electricity consumption in station facilities has been drawn up. Measures to reduce electricity consumption at Åsbro training centre have also been implemented.

During 2006 a number of efforts have been made to benefit biological diversity in powerline corridors. Inventories of a number of sections of powerlines have been carried out with respect to biotopes that are rich in species. Areas that are worth protecting and suitable measures to maintain them have been recorded in Svenska Kraftnät's maintenance system. Preparations have been made to create a number of viewing areas in Svenska Kraftnät's powerline corridors. Maps and information material will be produced, and it is estimated that the viewing areas will be ready to visit in summer 2007.

With the aim of comparing powerline corridors with other types of open ground – roadside verges and pastureland – on our behalf the Swedish University of Agricultural Sciences has carried out an inventory of plant-eating beetles in these three types of habitat. The results show that powerline corridors can contain a great diversity of species.



Cat's foot is dependent on open ground, e.g. powerline corridors.



A powerline corridor is being surveyed in connection with production of an environmental impact assessment for the new powerline between Järpströmmen and Nea.

In spring 2006 Svenska Kraftnät, in conjunction with the municipality of Åre and the Åre Design Centre, announced a competition to specially design a pylon in Åre. The winner, the artist Anna Cronheden from Åre, has now been commissioned to further develop the pylon in collaboration with a designer.

Svenska Kraftnät's environment prize will be awarded for the first time in March 2007. The aim of the prize is to stimulate development of new solutions, methods and products that can have a positive impact on the environment or reduce the environmental loading in the operations. The entries that are rewarded must have the capacity to lead to environmental improvements within the areas of development, planning, construction, maintenance and operation of high voltage networks and large power systems. The prize money amounts to a maximum of SEK 100,000.

After six years of research the National Board of Fisheries has come to the conclusion that the SwePol Link, the DC cable between Sweden and Poland, has had no negative effect on fishing. In 1999 the Environmental Court commissioned the National Board of Fisheries to investigate during a preliminary period of six years whether the Poland cable was detrimental to fishing. Environmental organisations and fishermen expressed misgivings that the magnetic field around the cable could disturb fish migrations. However, the National Board of

Fisheries' investigations have shown that the migratory patterns of eels, salmon and sea trout have not been affected by the cable.

#### **Aim and focus for 2007**

Among other things, the environmental work will be directed at building up knowledge and disseminating information concerning environmental legislation and its application within our field. There will be further training of project managers and maintenance engineers in current environmental issues. An inventory, including mercury, will be carried out in connection with the scrapping of control equipment in Horred station. The aim is to record which of the typical components in Svenska Kraftnät's facilities contain mercury or other hazardous materials. Further measures within the field of biological diversity in powerline corridors are also planned for 2007. Environmental audits will also be implemented at a number of construction and maintenance contracts.

## Employees

Svenska Kraftnät shall be an attractive employer with competent employees who are happy in their work. The number of full-time employed staff in the Group was at year-end 289 (276), of whom 203 (199) were men and 86 (77) women. Staff turnover amounted to 3.9 (4.5) % including retirement. Sick leave during the year was 3.8 (3.5) %.

The average age within the company is 47 (47). The total distribution according to age and gender is shown in the table below.

A total of 44 employees are due to retire from Svenska Kraftnät within the next five years.

### Goals for 2006

During 2006, Svenska Kraftnät has performed a number of activities aimed at achieving the following goals:

- The staff will continue to regard Svenska Kraftnät as an attractive employer
  - The proportion of female employees will increase to 29 % and the proportion of female managers to 30 %
  - Staff turnover will remain at a low level
  - Sick leave shall be reduced to 2.8 % and the proportion of employees with no sick leave shall be 60 %
  - A new management programme for prospective managers will be started
  - Age diversity will increase through the recruitment of younger staff
  - A new trainee programme will be started
  - Each employee shall have a personal development plan based on a fundamental skills analysis
- Svenska Kraftnät shall actively promote a planned transfer of experience from older to younger employees
  - Svenska Kraftnät shall be regarded both as a company that offers equal opportunities and as a very good employer for the parents of young children
  - Collaboration with selected universities will increase
  - Ethnic and cultural diversity shall be promoted, e.g. through recruitment
  - The number of employees who receive new job assignments (job rotation) will increase to 15
- Physical fitness shall on average increase by 20 %
  - There shall be no work-related long-term illnesses

In order to meet these targets, the company is conducting activities in four sub-areas: working environment, leadership, fitness and rehabilitation. However, sick leave has increased somewhat compared with the previous year, primarily due to the fact that several staff have been absent on long-term sick leave. Short-term sick leave is still very low.

During the course of the year the company has invested SEK 12,000 per employee in external development activities. For many years Svenska Kraftnät has offered executives an advanced leadership programme. The programme, which lasts for 18 months, was completed by eight managers during 2006.

During the year the majority of employees have undergone at least one planning discussion and performance appraisal, in which development requirements are also recorded.

An annual analysis is made of the experience and expertise of employees who are due to finish working at Svenska Kraftnät over the next five-year period. This task entails compiling what types of knowledge are of critical importance to the company and which must be transferred to other employees. One to two years before an employee is due to go into retirement, an assessment is made of which activities need to be carried out so that important knowledge is retained within Svenska Kraftnät. During 2006, the company has planned for this type of skills transfer for some ten employees.

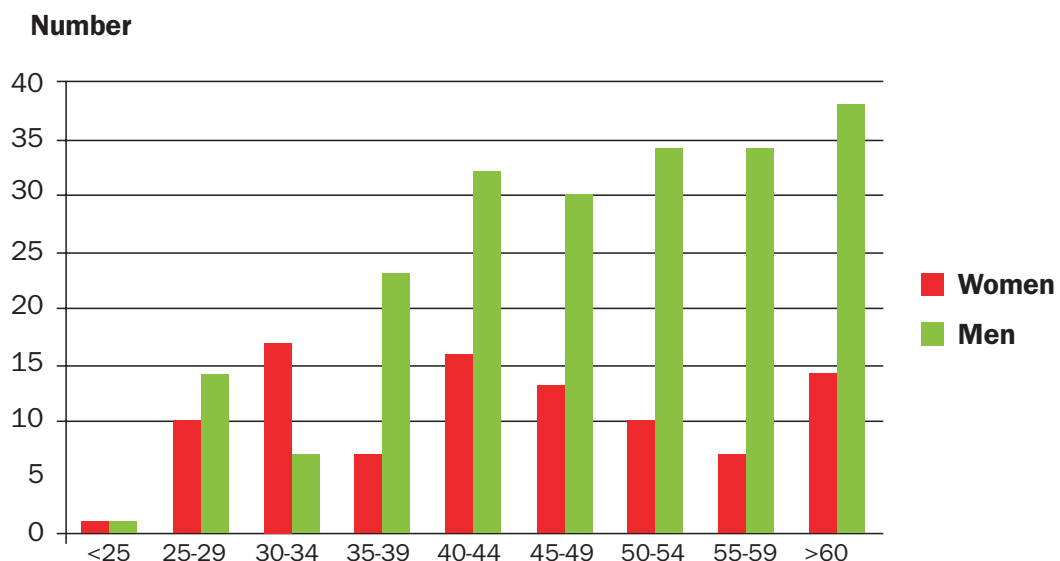
### Result for 2006

During 2006 a total of 26 employees were recruited, 13 of whom were women and 13 men. The average age of these new employees is 36. Staff turnover during the year has been low, 6 members of staff have left the company in addition to the 6 who retired. During the year 6 trainees – 3 women and 3 men – were recruited, all certified engineers. During the year 5 employees changed unit or department within the company.

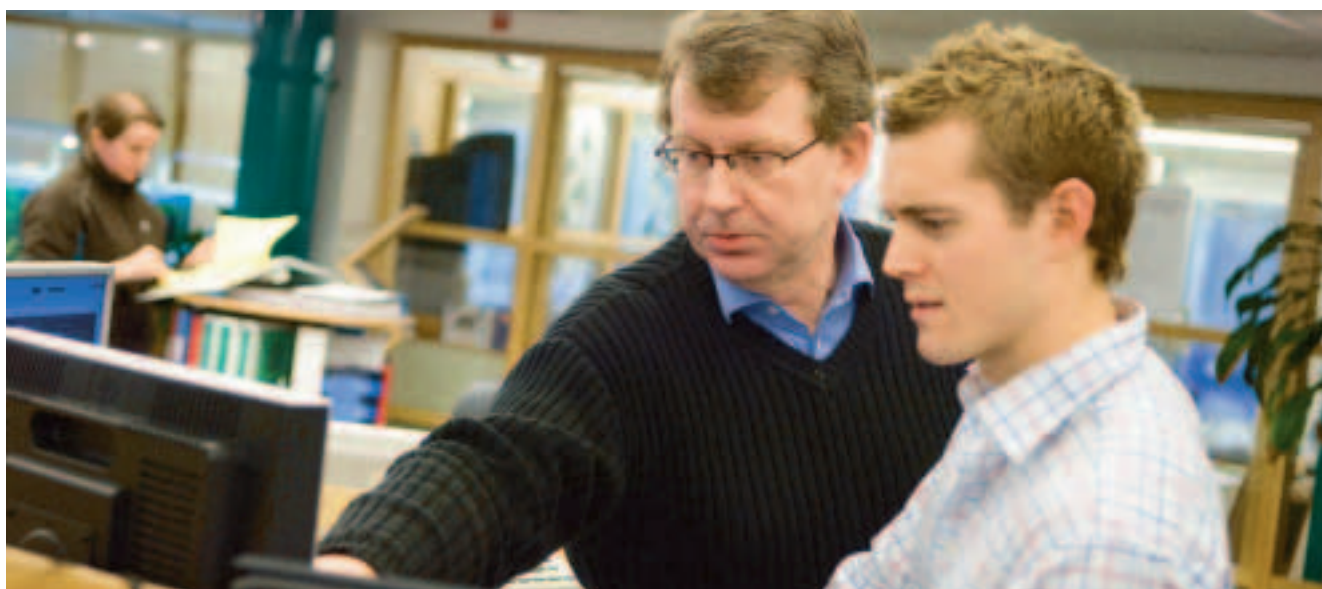
By the end of the year the proportion of female staff had increased to 29.7 %.

During the year Svenska Kraftnät has continued to focus on the creation of a “healthier company”. Keep-fit activities are centred on four overarching goals with the long-term aim that Svenska Kraftnät will to an even greater extent be a sound and healthy workplace. These are:

- Sick leave shall be max 2.5 %
- The proportion of employees with no sick leave shall be in excess of 65 %







Skills transfer – young people learning from those with experience – is an important task.

Sick leave ( % )	Up to 29	30- 49	Over 50	Total
Women	0.7	9.4	4.4	6.9
Men	0.6	2.0	3.1	2.5
<b>Total</b>	<b>0.6</b>	<b>4.7</b>	<b>3.4</b>	<b>3.8</b>

The proportion of long-term sick leave (longer than 60 days) has increased to 2.4 (2.1) %, which has had a significant effect on the total increase in sick leave. 56 (56) % of the staff have not had one single day of sick leave during the course of the year.

As usual, the equality plan has been updated during the year and the company's perception is that the equality work is regarded as positive. The employees also regard the company as being a very good employer for the parents of young children.

During the year Svenska Kraftnät has participated in careers fairs at KTH, Chalmers, Mid Sweden University and Halmstad University.

#### Svenska Kraftnät's goals for 2007

During 2007 the increased rate of investment will affect skills provision in a number of ways, including through a higher level of recruitment. Employees therefore need to develop their own skills in line with developments in the company and the changes that this involves in their work. Svenska Kraftnät will also have to increase its efforts to stimulate job rotation and generate opportunities for planned skills transfer.

Skills development shall also focus on future management provision and the development of specialists. It is also based on

changes that require special efforts, primarily the effect of a large number of retirements. The company's endeavours to achieve a more even gender distribution and a more balanced age profile will also be emphasised in the work carried out in 2007.

#### Goals for 2007

- The staff will continue to regard Svenska Kraftnät as an attractive employer. An employee survey to measure this aspect among others this will be conducted during 2007.
- The proportion of female employees will increase to 30 %, as will the proportion of female managers
- Staff turnover will remain at a low level
- Sick leave will be reduced to under 3 % and the proportion of employees with no absence due to sickness will be 60 %
- A new management programme for prospective managers will be started
- Age distribution will increase through the recruitment of younger staff
- Each employee shall have a personal development plan based on a fundamental skills analysis
- Svenska Kraftnät shall actively promote a planned transfer of experience from older to younger employees
- Svenska Kraftnät shall be regarded both as a company that offers equal opportunities and as a very good employer for the parents of young children
- Collaboration with selected universities will be further developed
- Ethnic and cultural diversity shall be promoted, e.g. through recruitment
- The number of employees who change jobs internally (job rotation) will increase to 15.

#### Goals for the period 2008–2009

The substantially increased rate of investment will have a pronounced effect on the company's skills provision in the coming years.

The prospects for recruiting skilled employees will continue to be good. Svenska Kraftnät will actively increase the proportion of women and female managers, primarily in the engineering departments.

Svenska Kraftnät also intends to invest in measures that further reduce sick leave and increase the number of employees with no sick leave.

Svenska Kraftnät will continue to conduct employee surveys in order to measure the extent to which employees are satisfied with their work and the company.

The focus of the surveys for 2008–2009 will be:

- Recruitment of specialists in order to cope with the increased rate of investment and large number of retirements
- Active recruitment of young academics and of female employees and managers
- Skills analyses and personal development plans for all employees
- Increased focus on our managers
- A focus on the transfer of skills from older to younger employees
- Sick leave reduced to under 3 %
- The proportion of employees with no sick leave shall be at least 65 %
- Good contact with universities and institutes of higher education.



The Board of Svenska Kraftnät.

## Incentive programme 2006

The purpose of Svenska Kraftnät's incentive programme is to create involvement in order to achieve a high level of operational reliability, a sound financial result, good cost effectiveness and a well-functioning company. In this way, Svenska Kraftnät's primary objective can be fulfilled: a reliable and efficient national grid. In 2006 there were also intermediate goals for gender equality (the proportion of female employees) and health (the proportion of full-time healthy employees).

The programme covers all employees apart from the Director General, whose financial conditions are determined by the Government.

The incentive programme is structured so that the maximum bonus is one month's salary. Goal achievement for 2006 was 65 % of a monthly salary. The allocation for 2006 is SEK 7.9 (11.2) million, including national insurance expenses.

## Governance for the Group

The operations of the Svenska Kraftnät Group are regulated through the Ordinance (1993:2013), including the instruction for the parent entity Svenska Kraftnät, and through the annual letter of governance. In connection with the adoption of the

national budget for the next year, Parliament decides on Svenska Kraftnät's investments and financial operations.

The letter of governance, within the expense area 21 Energy, describes the assignments and regulates the scope, conditions and authorizations for Svenska Kraftnät. According to the letter of governance the statement of accounts in Svenska Kraftnät's annual and interim reports shall follow the policies and guidelines in the State ownership policy where these are applicable for a state utility.

The government appoints the Board. According to 5§ of the Ordinance including the instruction for Svenska Kraftnät, the Director General and staff representatives are also included in the Board.

## The Board and its work

The Board of Svenska Kraftnät consists of nine members including two staff association representatives. The Board has held five meetings during the year.

During 2006 the work of the Board has been primarily focused on:

- The company's long-term development
- Financial effectiveness
- Major investments
- The need for re-investment in the national grid
- The expansion of wind power in Sweden
- Environmental issues
- Tele- and data communication strategy including IT security.

## Evaluation of Svenska Kraftnät's internal controls

The primary internal control takes place in the ordinary operation in the line organisation. In addition there is an internal auditor who is commissioned to review the operation according to an annual programme of internal controls.

On the instructions of the Director General an external firm of auditors has examined Svenska Kraftnät's control system, i.e. policies, internal controls and processes, in order to counteract financial irregularities. The inspection showed that Svenska Kraftnät has appropriate and effective controls but that the overall control structure can be improved. Such measures have been taken in order to further reinforce security and reduce the risks of financial irregularities.

## Svenska Kraftnät's values

In cooperation with the management and the employees, Svenska Kraftnät has worked out and determined which values best support our ambition to be one of the most effective national grid companies in the world. The values are summarised in the words: **efficiency, quality, social responsibility, spirit of cooperation and teamwork.**

**Efficiency:** We focus on good leadership and good routines in order to do the right things in a cost-conscious way.

**Quality:** It is extremely important that there is a high level of operational reliability in the electricity system. All aspects of our work must therefore be characterised by good quality, reliability and a long-term perspective.

**Social responsibility:** Electricity supply is so important and of such benefit to society that we must work with a high level of commitment to ensure that Sweden receives its electricity every second of the day. We also have an environmental responsibility to make sure that our powerlines and stations are designed in such a way that they encroach as little as possible on human beings and the countryside. As a central and neutral party in the open electricity market, it is important for us to treat the players equally and to provide them with good information.

**Spirit of cooperation:** We want to have satisfied customers and stakeholders. We shall be sensitive to their needs and keen to have good communication with them.

**Teamwork:** Within Svenska Kraftnät, we want to have a strong corporate feeling that is characterised by openness, clarity and consideration.

# Financial reports

## Income statements – the Group

### MSEK

	Note	Jan-Dec 2006	Jan-Dec 2005
<b>Operating revenue</b>			
Network revenue	1	3 050	3 283
System responsibility revenue – electricity	2	3 388	2 226
Telecommunications revenue		67	66
System responsibility revenue – natural gas		36	8
Renewable electricity certificates		20	18
Government grant for power contingency planning	3	253	259
Activated work for own account	4	24	25
<b>Total operating revenue</b>		<b>6 838</b>	<b>5 885</b>
<b>Operating expenses</b>			
Personnel expenses	5	-208	-210
Purchase of electricity		-698	-860
Purchased balancing power		-3 024	-1 844
Other operating expenses	6	-1 651	-1 531
Depreciation and write-down of intangible and tangible fixed assets	13, 14	-569	-558
<b>Total operating expenses</b>		<b>-6 150</b>	<b>-5 003</b>
Share of income in associated companies	7	48	30
<b>Operating income</b>	<b>8</b>	<b>736</b>	<b>912</b>
Result from financial investments			
Result from other securities and receivables that are fixed assets	9	2	9
Interest income and similar income items	10	3	5
Interest expenses and similar expense items	11	-60	-43
<b>Income after financial items</b>		<b>681</b>	<b>883</b>
Tax on income for the year	12	-5	-3
<b>Net income for the year</b>		<b>676</b>	<b>880</b>
Income attributable to:			
The state		678	882
Minority shares		-2	-2

## Comments on Income Statements

### Operating revenue and expenses

The Svenska Kraftnät Group's operating revenue amounted to SEK 6,838 (5,885) million, an increase of SEK 953 million.

The Group's network revenue decreased by SEK 233 million compared with the previous year. The decrease is due to lower transmission revenues on the national grid during the second six months. Congestion revenues decreased by SEK 93 million. System responsibility revenue for electricity amounted to SEK

3,388 million and increased by SEK 1,162 million. Included in this item is sold balancing power, which increased by SEK 1,212 million as a result of higher electricity prices during the year. Telecommunications revenue amounted to SEK 67 (66) million. System responsibility revenue for natural gas came to SEK 36 million after a full year of operations. In 2005 revenue was only SEK 8 million as the operation was not running at full scale until October.

Contingency planning has utilised funds amounting to SEK 253 (259) million, which is equivalent to the costs of contingency measures undertaken. Of these, SEK 240 (248) million has been financed by appropriations and SEK 12 (11) has been received in the form of grants from the Swedish Emergency Management Agency and SEK 1 million from the National Post and Telecom Agency.

Management of renewable electricity certificates produced revenues of SEK 20 (18)



In conjunction with the county administrative board in Örebro, Svenska Kraftnät has instigated a collaborative venture involving the maintenance of a number of sections of powerline corridors in Kilsbergen, where the threatened marsh fritillary butterfly has been found.

million. The fees for renewable electricity certificates are set by the government and regulated in accordance with the ordinance (2003:120) on renewable electricity certificates.

The Group's operating expenses amounted to SEK 6,150 (5,003) million.

Staff expenses amounted to SEK 208 million, a reduction of SEK 2 million that is chiefly due to an adjusted pension liability brought forward of SEK 8 million.

Expenses for purchase of electricity were SEK 698 million, which is a decrease of SEK 162 million. The decrease is due to the fact that transmission losses were 0.7 TWh less than the previous year.

Expenses for balancing power increased by SEK 1,180 million as a consequence of the higher electricity prices.

The Group's other operating expenses increased by SEK 120 million. For a period of three days at the end of December there was an imbalance in the Swedish electricity system in an east-west direction due to the fact that a number of nuclear power stations were out of operation. At the same time the submarine cable between Sweden and Finland was not in function. The situation that arose was dealt with through counter trading which cost just over SEK 45 million. The year's expenses for primary regulation increased by SEK 110 million as electricity prices were at a higher level.

Depreciation of tangible and intangible fixed assets amounted to SEK 569 (558) million.

#### Operating income

Operating income for the Group decreased by SEK 176 million to SEK 736 million. Operating income consists of external reve-

nue and expenses in the business segments and the profit/loss from associated companies. The operating income includes Group depreciation and write-downs.

The predominant business segment in Svenska Kraftnät's operations is Network, with an operating income for the year of SEK 677 (801) million. The lower level of income is primarily due to the mild autumn that generated less energy revenue and congestion revenue during the second half of the year. Some items concern both the business segments Network and System responsibility for electricity. When it has not been possible to link these activities to a business segment, the costs have been distributed on a standard basis.

The business segment System responsibility for electricity generated an operating income of SEK -41 (56) million. This is SEK 97 million lower than last year and is explained by higher expenses for primary regulation on account of the higher price of electricity.

Operating income from telecom operations amounted to SEK 31 million, which is an improvement of SEK 13 million compared with last year. The explanation is reduced expenses for maintenance and depreciation of fixed assets of SEK 7 million the previous year.

The renewable electricity certificate operation increased its operating income by SEK 6 million to SEK 14 million and System responsibility for natural gas showed a positive operating income of SEK 7 million.

There are six associated companies in the Group and only Svenska Kraftnät's profit/loss component is included in the consolidated profit/loss. The profit components for 2006 amounted to SEK 48 (30) million.

Nord Pool ASA and Nord Pool Spot AS account for the majority of the operating income after increased activity on the Nordic electricity exchange during the year.

The operating margin for the Group amounted to 10.8 (15.5) %, which is 4.7 percentage points better than the previous year.

#### Net financing

The Group's net financial income/expense amounted to SEK -55 (-29) million. This is a deterioration of SEK 26 million compared with 2005.

The result from other securities and receivables that are fixed assets amounted to SEK 2 (9) million and has been negatively affected during the year as a result of exchange rate differences of SEK 8 million.

The Group's interest income decreased by SEK 2 million to an outcome of SEK 3 million due to lower liquidity during 2006. The group's interest expenses and similar amounted to SEK 60 million and thereby increased by SEK 17 million. The increased interest expenses are primarily due to the fact that the parent entity paid an additional dividend to the state in January of SEK 1,000 million, which entailed an increase in the Group's borrowings.

The interest coverage ratio amounted to 12.4 (21.5) times.

#### Net income for the year

Consolidated net income for 2006 amounted to SEK 676 million, which is SEK 204 million lower than in 2005. The result means a return of 7.9 (10.1) % on adjusted equity.

The net profit margin with a deduction for standard tax was 7.1 (10.8) %.

## Balance sheet – the Group

### MSEK

	Note	2006-12-31	2005-12-31
<b>ASSETS</b>			
<b>Fixed assets</b>			
Intangible fixed assets	13	224	207
Tangible fixed assets	14	8 545	8 655
Shares and participations in associated companies	16	357	328
Long-term receivables		55	61
Income taxes recoverable		4	2
<b>Total fixed assets</b>		<b>9 185</b>	<b>9 253</b>
<b>Current assets</b>			
Inventories		89	73
Current receivables	17	306	380
Prepaid expenses and accrued income	19	412	396
Liquid funds		59	264
<b>Total current assets</b>		<b>866</b>	<b>1 113</b>
<b>Total assets</b>		<b>10 051</b>	<b>10 366</b>
<b>EQUITY AND LIABILITIES</b>			
<b>Equity referable to owners</b>			
Government capital		600	600
Other paid-up capital		3 314	3 314
Retained earnings incl. net income for the year		2 579	3 474
<b>The Government's capital</b>		<b>6 493</b>	<b>7 388</b>
<b>Minority interests</b>		<b>46</b>	<b>48</b>
<b>Total equity</b>		<b>6 539</b>	<b>7 436</b>
<b>Long-term liabilities</b>			
Interest-bearing liabilities	20	1 960	1 333
Non-interest-bearing liabilities		356	385
Advance payments from customers		102	106
Deferred tax liability		19	14
Provisions for pensions	21	253	240
<b>Total long-term liabilities</b>		<b>2 690</b>	<b>2 078</b>
<b>Current liabilities</b>			
Interest-bearing liabilities	22	98	98
Accounts payable		274	292
Other liabilities		60	66
Accrued expenses and prepaid income	23	390	396
<b>Total current liabilities</b>		<b>822</b>	<b>852</b>
<b>Total equity and liabilities</b>		<b>10 051</b>	<b>10 366</b>
<b>Pledged assets</b>		<b>None</b>	<b>None</b>
<b>Contingent liabilities</b>	24, 25	<b>20</b>	<b>20</b>



## Comments on Balance Sheet

### Balance sheet total

The consolidated balance sheet total amounted to SEK 10,051 (10,366) million, which is a decrease of SEK 315 million.

### Fixed assets

Svenska Kraftnät's intangible fixed assets consist of land rights, rights of use for fibre-optic cables, licences and capitalized expenditure for computer programs. The book value of these is SEK 224 (207) million. The increase is a consequence of investments in computer programs of SEK 36 (52) million in, among other items, new settlement systems.

The tangible assets consist primarily of power cables, stations, buildings and land, fibre-optic connections and other technical facilities and construction in progress. The value of the tangible assets amounted to SEK 8,545 (8,655) million, which is a decrease of SEK 110 million. Net investments during the year have been lower than depreciation.

The other fixed assets consist of participations in associated companies, long-term receivables from associated companies and

income taxes recoverable. Participations in associated companies amounted to SEK 357 (328) million. Profit participation in the financial statements is SEK 48 million, which increased the financial assets. During the year, the parent entity received a dividend of SEK 19 (18) from Nord Pool ASA.

### Current assets

Current assets amounted to SEK 866 (1,113) million. The decrease was primarily attributable to lower accounts receivable and liquid funds as a result of lower operating revenue in the fourth quarter compared with the corresponding period in 2005. Liquid funds amounted to SEK 59 (264) million at year end and have decreased by SEK 205 million. The decrease is mainly attributable to the fact that the parent entity had an unusually high level of liquidity at SEK 232 million at the end of the previous year.

### Equity

Equity at year-end was SEK 6,539 (7,436) million, of which SEK 2,579 (3,474) million consisted of retained earnings. During the course of the year, SEK 1,573 (337) million has been distributed to the Government. Net Group profit for the year amounted to SEK 676 (880) million.

### Long-term liabilities

The Group's long-term liabilities that are interest-bearing consist of the parent entity's financing with the National Debt Office of SEK 709 (0) million and the external financing of subsidiaries of SEK 1,251 (1,333) million.

The interest-bearing borrowing requirements in the Group have increased during 2006 by SEK 627 million. The average interest on the loans for the Group has been 3.4 (2.2) %.

Advance payments from customers within fibre-optic operations amounted to SEK 102 (106) million. The agreement periods vary from 15 to 25 years and the advance payments are taken up as revenue during this period.

The level of the net loan debt increased by SEK 845 million and amounted to SEK 2,252 (1,407) million. The increase was primarily due to the additional dividend of SEK 1,000 million that the parent entity paid to the Government after a Government decision of 20 December 2005. This meant that the debt/equity ratio increased during the year to 0.38 (0.22).

# Cash flow statements – the Group

## MSEK

	2006	2005
<b>The year's operations</b>		
Operating income	736	912
<i>Adjustment for items not included in cash flow</i>		
Depreciation	569	558
Other items	-22	-7
Interest paid	-58	-46
<b>Cash flow from operations before changes in working capital</b>	<b>1 225</b>	<b>1 417</b>
<b>Changes in working capital</b>		
Change in inventories	-16	-4
Change in current receivables	58	-95
Change in current liabilities	-31	200
<b>Cash flow from the year's operations</b>	<b>1 236</b>	<b>1 518</b>
<b>Investment activities</b>		
Investments in tangible and intangible fixed assets	-478	-338
Change in long-term receivables	0	0
Sale of fixed assets	2	1
<b>Cash flow from investment activities</b>	<b>-476</b>	<b>-337</b>
<b>Financing activities</b>		
Change in interest-bearing liabilities	627	-1 120
Change in other long-term liabilities	-26	405
Advance payments from customers	7	15
Dividend	-1 573	-337
<b>Cash flow from financing activities</b>	<b>-965</b>	<b>-1 037</b>
<b>Cash flow for the year</b>	<b>-205</b>	<b>144</b>
Liquid assets at the beginning of the year	264	120
Liquid assets at year-end	59	264

## Comments on Cash Flow Statements

The purpose of the Cash Flow Statement is to describe the capacity of the Svenska Kraftnät Group to generate liquid assets and to serve as a complement to the income statement and balance sheet descriptions of profitability and financial position. Liquid assets is understood to be cash and bank balances.

### The year's operations

Cash flow from the year's operations before changes in operating capital increased by SEK 192 million compared with the previous year and amounted to SEK 1,225

million. Cash flow from the year's operations amounted to SEK 1,236 (1,518) million. The deterioration is primarily a result of the lower level of operating income.

### Investment activities

The Group's investments amounted to SEK 478 (338) million. Investments in the parent entity amounted to SEK 462 million, SEK 10 million in the subsidiary SwePol Link and SEK 6 million in Svenska Kraftnät Gasturbiner AB. During 2005 investments were made in the parent entity of SEK 335 million and in the subsidiary SwePol Link of SEK 1 million and SEK 2 million in Svenska Kraftnät Gasturbiner AB.

### Financing activities

The Group's interest-bearing liabilities decreased by SEK 627 (1,120) million. Interest-bearing liabilities in the parent entity increased by SEK 709 million, and in the subsidiary SwePol Link external interest-bearing liabilities dropped by SEK 82 million. The other subsidiary, Svenska Kraftnät Gasturbiner AB, reduced its in-Group interest-bearing liabilities by SEK 13 million.

A dividend of SEK 1,573 (337) million has been paid to the government. The dividend paid is reported against an income title, linked to the Government budget, in accordance with the table below, in TSEK.

Income title, TSEK	Amount to pay in	Amount paid in
2116 Parent entity's delivered dividend	1 573 000	1 573 000



## Change in equity – the Group

### MSEK

	Referable to the Government			Total	Referable to minority interests	Total equity
	Government capital	Other paid-up capital	Profit brought forward incl. net income for the year			
<b>Opening balance 2005</b>	<b>600</b>	<b>3 314</b>	<b>2 929</b>	<b>6 843</b>	<b>50</b>	<b>6 893</b>
Dividend	—	—	-337	-337	—	-337
Net income for the year	—	—	882	882	-2	880
<b>Closing balance 2005</b>	<b>600</b>	<b>3 314</b>	<b>3 474</b>	<b>7 388</b>	<b>48</b>	<b>7 436</b>
<b>Opening balance 2006</b>	<b>600</b>	<b>3 314</b>	<b>3 474</b>	<b>7 388</b>	<b>48</b>	<b>7 436</b>
Dividend	—	—	-1 573	-1573	—	-1 573
Net income for the year	—	—	678	678	-2	676
<b>Closing balance 2006</b>	<b>600</b>	<b>3 314</b>	<b>2 579</b>	<b>6 493</b>	<b>46</b>	<b>6 539</b>

### Profit brought forward including net income for the year

Profit brought forward including net income for the year is constituted by profit accrued in the parent entity and its subsidiaries as well as associated companies. Previous provisions to restricted reserves are included

in this capital item. The above statement is compiled as if Svenska Kraftnät were an independent group with formal ownership. Svenska Kraftnät is a public utility and a part of the Swedish Government.

The allocation of profit proposed in the annual report for 2005 was adopted by the Government.

## Income statements – Parent Entity

### MSEK

	Note	2006	2005
<b>Operating revenue</b>			
Network revenue	1	2 849	3 083
System responsibility revenue – electricity	2	3 389	2 227
Telecommunications revenue		67	66
System responsibility revenue – natural gas		36	8
Renewable electricity certificates		20	18
Government grant for power contingency planning	3	253	259
Activated work for own account	4	24	25
<b>Total operating revenue</b>		<b>6 638</b>	<b>5 686</b>
<b>Operating expenses</b>			
Personnel expenses	5	-208	-210
Purchase of electricity		-698	-860
Purchased balancing power		-3 027	-1 849
Other operating expenses	6	-1 652	-1 523
Depreciation of tangible and intangible fixed assets	13, 14	-426	-417
<b>Total operating expenses</b>		<b>-6 011</b>	<b>-4 859</b>
<b>Operating income</b>		<b>627</b>	<b>827</b>
<b>Result from financial investments</b>			
Result from other securities and receivables that are fixed assets	9	26	33
Interest income and similar income items	10	2	2
Interest expenses and similar expense items	11	-17	-4
<b>Income after financial items</b>		<b>638</b>	<b>858</b>



## Balance sheet – Parent Entity

### MSEK

		2006-12-31	2005-12-31
<b>ASSETS</b>	<b>Note</b>		
<b>Fixed assets</b>			
<b>Intangible fixed assets</b>			
	13		
Capitalized expenditure for computer programmes		24	12
Land rights		67	71
Rights of use		49	53
Construction in progress		84	71
<b>Total intangible fixed assets</b>		<b>224</b>	<b>207</b>
<b>Tangible fixed assets</b>			
	14		
Buildings and land		169	172
Machinery and equipment		5 989	5 951
Construction in progress		450	466
<b>Total tangible fixed assets</b>		<b>6 608</b>	<b>6 589</b>
<b>Financial fixed assets</b>			
Shares and participations in Group companies	15	12	12
Receivables from Group companies		144	157
Shares and participations in associated companies	16	177	177
Receivables from associated companies		55	59
Long-term receivables		0	2
<b>Total financial fixed assets</b>		<b>388</b>	<b>407</b>
<b>Total fixed assets</b>		<b>7 220</b>	<b>7 203</b>
<b>Current assets</b>			
<b>Inventories</b>			
		<b>2</b>	<b>5</b>
<b>Current receivables</b>			
Accounts receivable		210	256
Receivables from Group companies		26	21
Receivables from associated companies		4	4
Other receivables		18	44
Receivables from the public utility's cheque account	18	48	49
Prepaid expenses and accrued income	19	411	392
<b>Total current receivables</b>		<b>717</b>	<b>766</b>
<b>Cash and bank balances</b>			
		<b>11</b>	<b>232</b>
<b>Total current assets</b>		<b>730</b>	<b>1 003</b>
<b>Total assets</b>		<b>7 950</b>	<b>8 206</b>

# Balance sheet – Parent Entity

## MSEK

	Note	2006-12-31	2005-12-31
<b>EQUITY AND LIABILITIES</b>			
<b>Equity</b>			
<b>Restricted equity</b>			
Government capital		600	600
Other paid-up capital		3 314	3 314
<b>Total restricted equity</b>		<b>3 914</b>	<b>3 914</b>
Retained earnings incl. net income for the year		1 676	2 391
Net income for the year		638	858
<b>Total unrestricted equity</b>		<b>2 314</b>	<b>3 249</b>
<b>Total equity</b>		<b>6 228</b>	<b>7 163</b>
<b>Interest-bearing provisions</b>			
Provisions for pensions	21	253	240
<b>Interest-bearing long-term liabilities</b>	20	<b>709</b>	<b>0</b>
<b>Non-interest-bearing long-term liabilities</b>			
Non-interest-bearing liabilities		1	2
Advance payments from customers		102	106
<b>Total non-interest-bearing long-term liabilities</b>		<b>103</b>	<b>108</b>
<b>Non-interest-bearing current liabilities</b>			
Accounts payable		264	283
Liabilities to Group companies		0	0
Other liabilities		27	17
Accrued expenses and prepaid income	23	366	395
<b>Total non-interest-bearing current liabilities</b>		<b>657</b>	<b>695</b>
<b>Total equity and liabilities</b>		<b>7 950</b>	<b>8 206</b>
<b>Pledged assets</b>		<b>None</b>	<b>None</b>
<b>Contingent liabilities</b>	24, 25	<b>20</b>	<b>20</b>

## Cash flow statements – Parent Entity

### MSEK

	2006	2005
<b>The year's operations</b>		
Operating income	627	827
<i>Adjustment for items not included in cash flow</i>		
Depreciation	426	417
Other items	49	45
Interest paid	-16	-6
<b>Cash flow from operations before changes in working capital</b>	<b>1 086</b>	<b>1 283</b>
<b>Changes in working capital</b>		
Change in inventories	3	-5
Change in current receivables	49	-89
Change in current liabilities	-39	165
<b>Cash flow from the year's operations</b>	<b>1 099</b>	<b>1 354</b>
<b>Investment activities</b>		
Investments in tangible and intangible fixed assets	-462	-335
Change in long-term receivables	0	21
Sale of fixed assets	0	1
<b>Cash flow from investment activities</b>	<b>-462</b>	<b>-313</b>
<b>Financing activities</b>		
Change in interest-bearing liabilities	709	-559
Change in other long-term liabilities	-1	0
Advance payments from customers	7	15
<b>Dividend</b>	<b>-1 573</b>	<b>-337</b>
<b>Cash flow from financing activities</b>	<b>-858</b>	<b>-881</b>
<b>Cash flow for the year</b>	<b>-221</b>	<b>160</b>
Liquid assets at the beginning of the year	232	72
Liquid assets at year-end	11	232

## Change in equity – Parent Entity

### MSEK

	Government capital	Other paid-up capital	Profit brought forward incl. net income for the year	Total
<b>Opening balance 2005</b>	<b>600</b>	<b>3 314</b>	<b>2 728</b>	<b>6 642</b>
Dividend	—	—	-337	-337
Net income for the year	—	—	858	858
<b>Closing balance 2005</b>	<b>600</b>	<b>3 314</b>	<b>3 249</b>	<b>7 163</b>
<b>Opening balance 2006</b>	<b>600</b>	<b>3 314</b>	<b>3 249</b>	<b>7 163</b>
Dividend	—	—	-1 573	-1 573
Net income for the year	—	—	638	638
<b>Closing balance 2006</b>	<b>600</b>	<b>3 314</b>	<b>2 314</b>	<b>6 228</b>

## Five year review – the Group

### MSEK

<b>Income statement</b>		<b>2006</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>
Operating revenue		6 838	5 885	5 335	5 633	5 096
Operating revenue excluding depreciation		-5 581	-4 445	-4 201	-4 717	-3 967
Depreciation		-569	-558	-537	-527	-512
Share of income in associated companies		48	30	23	19	40
<b>Operating income</b>		<b>736</b>	<b>912</b>	<b>620</b>	<b>408</b>	<b>657</b>
Financial items		-55	-29	-67	-118	-109
<b>Income after financial items</b>		<b>681</b>	<b>883</b>	<b>553</b>	<b>290</b>	<b>548</b>
Tax on income for the year		-5	-3	-15	1	-5
<b>Net income for the year</b>		<b>676</b>	<b>880</b>	<b>538</b>	<b>291</b>	<b>543</b>
<b>Balance Sheet, MSEK</b>		<b>2006</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>
Intangible fixed assets		224	207	171	132	110
Tangible fixed assets		8 545	8 655	8 916	9 081	9 240
Financial fixed assets		416	391	372	364	372
Inventories		89	73	69	71	59
Current receivables		718	776	681	677	835
Liquid funds		59	264	120	99	165
<b>Total assets</b>		<b>10 051</b>	<b>10 366</b>	<b>10 329</b>	<b>10 424</b>	<b>10 781</b>
Equity		6 539	7 435	6 892	6 664	6 729
<i>Long-term liabilities</i>						
Interest-bearing		1 960	1 333	2 423	2 667	2 813
Non-interest-bearing		477	505	111	112	104
Provisions		253	240	220	195	190
<i>Current liabilities</i>						
Interest-bearing		98	98	128	127	138
Non-interest-bearing		724	755	555	659	807
<b>Total equity and liabilities</b>		<b>10 051</b>	<b>10 366</b>	<b>10 329</b>	<b>10 424</b>	<b>10 781</b>
<b>Key business ratios</b>		<b>2006</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>
Return on adjusted equity after tax	%	7.9	10.1	6.2	3.5	6.6
Return on total capital	%	7.3	8.9	5.8	3.9	8.3
Return on capital employed	%	9.0	10.8	6.7	4.6	8.4
Equity/assets ratio	%	58.5	62.8	59.2	57	55.5
Operating margin	%	10.8	15.5	11.6	7.2	12.9
Net profit margin after tax	%	7.1	10.8	7.0	3.7	7.6
Capital turnover ratio	%	67.0	56.9	51.4	53.1	48.1
Debt/equity ratio	times	0.38	0.22	0.43	0.49	0.50
Self-financing level	times	2.8	4.4	2.6	2.0	2.3
Interest coverage ratio	times	12.4	21.5	7.6	3.3	4.6
<b>Other</b>						
Internally allocated funds	MSEK	1 225	1 417	1 089	844	989
Net liability	MSEK	2 252	1 407	2 651	2 897	2 982
Investments	MSEK	478	338	410	411	460
Average no. of employees		282	277	269	261	249

# Additional information and notes

## Accounting and valuation principles

### Basis for drawing up the reports

Svenska Kraftnät's accounts comply with Ordinance (2000:606) on public authority book-keeping and the Swedish National Finance Management Authority's (ESV's) regulations and general advice. The ordinance corresponds with the Book-Keeping Act but is adapted to the special preconditions that apply for Government authorities and utilities. With certain exceptions that are stipulated in the document on Government appropriations, the Annual Report is drawn up in accordance with the Ordinance (2000:605) on annual reports and budget input and ESV's regulations and general advice. Part of Svenska Kraftnät's operations – contingency planning – is financed via Government grants. For this particular activity, the provisions of Ordinance (1996:1189) on grants also applies, which among other things regulates the principles for grant settlement and how non-utilised funds may be retained between different budget years.

Svenska Kraftnät has made departures from the above ordinance when preparing the Group's income statements and balance sheets, cash flow statements and changes in equity in order to provide a more true and fair picture of the Group's financial status and better comparability with Swedish groups quoted on the stock exchange.

### Preconditions for the drafting of the Group's financial reports

The parent company's functional currency for reporting is Swedish crowns (SEK) for both the parent company and the Group. All amounts that are given are rounded off to the nearest million crowns (MSEK) unless otherwise indicated. Items related to income statements refer to the period 1 January – 31 December and items related to balance sheets refer to 31 December. Figures within brackets apply to the previous year's values.

## Consolidated accounts principles

### The extent of the Group

Svenska Kraftnät comprises the parent company – the Svenska Kraftnät public utility – along with three subsidiaries and six associated companies. The parent company is a Swedish public utility that has its head office in Stockholm. The Group is under the controlling influence of the Swedish government.

The subsidiaries and associated companies are limited liability companies or companies with a corresponding legal status abroad.

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

### Consolidation principles

The consolidated accounts are drawn up in accordance with the acquisition method, which means briefly that the acquisition cost for the shares in the subsidiary are eliminated against the equity that exists in the subsidiary at the time of the acquisition. The recommendations of the Swedish Financial Accounting Standards Council concerning consolidated accounts are applied.

Minority participations in the net income and equity in part-owned subsidiaries are presented separately in the calculation of the Group's net income and equity. Internal profits within the Group are eliminated in their entirety.

Associated companies are reported in accordance with the equity method. This means that the book value of shares and participations in associated companies in the consolidated accounts is valued at the Group's share of the associated companies' equity. Svenska Kraftnät's share of the associated companies' result is thereby included in the Group's result and dividend distributed. The share is included in the retained earnings brought forward.

### Untaxed reserves/appropriations

When drawing up the consolidated accounts untaxed reserves and appropriations reported in the individual companies have been divided up into deferred tax and restricted equity. The deferred tax liability has been calculated at the current tax rate.

### Translation of foreign subsidiaries and associated companies

For all companies within the Group local currency corresponds to the functional currency for the company. Swedish kronor, which is the parent company's functional and reporting currency, is used in the consolidated accounts. Assets and liabilities are translated to the exchange rate on the balance sheet date. Unrealised exchange rate gains and exchange rate losses are included in the result.

The subsidiary SwePol Link AB's Polish subsidiary's annual accounts have been translated into Swedish kronor in accordance with the monetary method, which means that monetary items are translated into the balance sheet date rate and non-monetary items into the rate at the time of the investment. The translation difference between monetary assets and liabilities is included in the net income for the year for the Group and is reported in the income statement. The monetary method is used because the operations of the Polish company are regarded as an integrated part of SwePol Link AB's activities.

### Revenue accounting

Revenues are reported to the extent to which it is likely that the financial advantages will be to the benefit of the Group and that the revenues can be calculated in a reliable way. Revenues are reported net of VAT. Intra-group sales are eliminated in the consolidated accounts.



### Network revenue

Network revenue consists of both subscriber fees as well as energy dependent fees. Subscriber fees or power charges are fixed annual fees that are reported as income linearly throughout the period which the fee is meant to cover, while the energy-dependent fee is reported as income in connection with the use of Svenska Kraftnät's services.

### System responsibility revenue for electricity

Revenue consists of power sold for balance services, revenue for the use of the IT system Ediel and revenue in order to cover the costs of power reserves. From 1 January 2005 the Group reports its revenue and expenses gross for system responsibility per hour instead of as previously per fourteen day period. If the customer has overall purchased power during the period, this is shown as an income for Svenska Kraftnät whereas if the customer has instead overall sold power, it is reported as a balancing power cost.

### System responsibility revenue for natural gas

Revenue consists of sold natural gas for the power balancing service. System responsibility for natural gas generates both revenue for sold natural gas as well as expenses for purchased natural gas. This is reported and settled on a gross basis per day.

Other operating revenue is reported as revenue in conjunction with the provision of the service. To a certain extent, customers can pay in advance. The advance payment is then deducted against income as the service is carried out.

### Segment accounting or line of business

The Svenska Kraftnät Group's primary segments are lines of business. The Group's operations are divided into six business segments. A business segment is a unit identifiable within Svenska Kraftnät's accounts that is distinguished from other business segments on the basis of the risks and opportunities involved in each assignment.

### Interest income

Interest income is reported concurrently as it is accrued, i.e. it is accounted in the income statement in the period in which it arises.

### Interest expenses

Interest expenses consist of interest and other expenses that arise when borrowing capital. Interest expenses are reported in the period they relate to. Interest expenses during the construction period are activated with the construction of capital assets in excess of SEK 50 million.

### Receivables and liabilities

Assets and liabilities have been valued at the acquisition value if not otherwise specified. Doubtful debts are entered at the amount that is estimated will be paid after individual assessment.

### Receivables and liabilities in foreign currency

Receivables and liabilities in foreign currency are valued at the exchange rate on the balance sheet date. The difference between the value on the date of acquisition and the balance sheet date has been added to the result.

### Inventories

The inventory consists of fuel for gas turbines and natural gas.

The stock has been valued at the lowest of the acquisition value and the real value.

### Liquid funds

Liquid funds comprise cash and bank balances.

### Reporting of leasing agreements

All leasing agreements are reported as operational leases and written-off linearly. There are no financial leasing agreements.

### Tangible fixed assets

Tangible fixed assets are reported at their acquisition value with a deduction made for accumulated depreciation and write-downs. Investments are regarded as being new construction as well as conversions and extensions that in the long term increase standard, quality or performance.

Expenditure for repairs and maintenance are reported as an expense in the period in which they occur. Included under maintenance are works that are needed in order for it to be possible for a facility to be used in the original way intended, but which do not increase its performance or significantly extend its lifetime.

Interest expenses during the construction period are activated with the construction of facilities in excess of SEK 50 million.

### Intangible fixed assets

Expenditure for land rights, rights of use in fibre-optic connections, licences, construction in progress and development expenses

for computer programmes are carried forward and written off linearly over the duration of use. All intangible fixed assets have a limited period of use. Since 2002 land rights are written off according to the assessed period of use, which for a cable concession is often 40 years.

Rights of use are for fibre-optic cables and are written off over a period of between 15 and 25 years.

### Depreciation

Depreciation according to plan is based on the acquisition value of the assets and the estimated period of use. Linear depreciation is used for all fixed assets.

### Provisions

A provision is reported in the balance sheet when there is a legal or informal undertaking as a consequence of an event that has occurred, it is likely that an outflow of resources is required to settle the undertaking and that the amount can be estimated in a reliable way.

### Taxes

Svenska Kraftnät's subsidiaries are obliged to pay income tax for limited liability companies, whereas Svenska Kraftnät as a state utility and part of the Swedish Government is free from income tax, i.e. is not a tax subject. Deferred tax for differences between the reported and fiscal result is not reported by the parent entity and the Svenska Kraftnät Group, with the exception of the SwePol Link Group and for untaxed reserves in the Swedish subsidiaries. Deferred tax receivables are reported to the extent that sufficient taxable surplus is deemed likely to be available within the foreseeable future.

### Pension commitments

Since 2003 a new pension agreement, PA-03, applies for state employees born in 1943 or later. For employees born in 1942 or earlier PA-91 still applies. The size of the pension provision is calculated by the

#### Annual depreciation rates

Transmission lines, excluding submarine cables and associated lines	2.5 %
Submarine cables, excluding SwePol Link, and associated lines	3.3 %
SwePol Link	5.0 %
Control equipment in stations	6.7 %
Other station components	3.3 %
Fibre-optic connections	4.0 %
Spare parts	6.7 %
Telecom and information systems	6.7 - 20.0 %
Gas turbine plants	5.0 %
PCs and equipment	33.3 %

The residual value and duration of use of assets is regularly checked and adjusted when necessary.

National Government Employee Pensions Board (SPV). PA-03 includes old-age pension, survivors' pension and disability pension.

PA-03 includes the following old-age pensions:

- Contribution pensions – individual old-age pension and supplementary old-age pension, Kåpan. Premiums are paid for these as well as
- Defined-benefit pensions – old-age pension on incomes over 7.5 basic income and old-age pension in accordance with transitional rules for employees born between 1943 and 1972.

These commitments are reported under Provision for pensions.

The year's pension provisions have been written off together with premiums paid. The interest component in the year's pension expenses is reported as an interest expense. In addition to the 2.5 % interest rate, the interest component also includes index-linking of certain benefits.

About 23 % of the employees were not updated, which means that their pension provision has been calculated at a standard rate. Updating means that SPV carries out an overall review of all the positions a state employee has held, in both the public and private sectors. If there are gaps in the period of employment the pension provision is entered at a standard rate. Among other things, this means that SPV assumes that the employee has been in state employment from the age of 28, and that the provision is calculated with a factor of 0.95. This means

that the actual provision might be less or more. The component of the pension provision that is calculated at a standard rate, including employer's contribution, amounts to SEK 16 million. Svenska Kraftnät considers that the pension provision is not too low and has chosen to report the pension provision calculated by SPV.

The pension liability reported is constituted by the technically calculated assumptions that Svenska Kraftnät is responsible for according to the PA-91 and PA-03 pension agreements. The pension provision is calculated in accordance with the basis that the board of SPV has laid down. The pension provision includes commitments with respect to both active personnel and pensioners.

Svenska Kraftnät pays a special payroll tax on paid out pensions in accordance with Ordinance (1991:704) on the establishment of special payroll tax on state pension expenses and not based on allocations for pensions. Since the pension provision is for future pension outlays, an allocation is made for special payroll tax based on the size of the pension provision at the end of the year.

#### Government support

External contributions to investments reduce the acquisition value of the investment by an equivalent amount.

#### Research and development expenses

Development work is an integrated aspect of the operation and refers to measures for long-term improvements that are written off continuously during the year. Svenska Kraftnät conducts research and development work with the aim of increasing reliability

performance, effectiveness and environmental adaptation of the network and system operations. No expenses are therefore activated for development.

#### Cash flow statement

The cash flow statement is drawn up in accordance with the indirect method. The reported cash flow comprises transactions that entail receipts and payments. This means that discrepancies can occur compared with changes in individual items in the balance sheet.

#### Borrowing

Borrowing is reported at a nominal amount.

#### Shares and participations in Group companies

Share and participations in Group companies are reported at acquisition value with deductions for any write-downs. Dividends received are reported when the right to a dividend is deemed to be secure.

#### Supervisory Authority

The supervisory authority for network operations is the Energy Market Inspectorate at the Swedish Energy Agency.

## Notes

### Note 1 Network revenue

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Power fee, national grid	1 074	1 071	1 109	1 104
Power fee, national grid	1 233	1 378	1 233	1 378
Congestion revenue	320	413	320	413
Transit revenue	139	136	139	136
Transmission on SwePol Link	232	225	-	-
Other revenue	52	60	48	52
<b>Total</b>	<b>3 050</b>	<b>3 283</b>	<b>2 849</b>	<b>3 083</b>

### Note 2 System responsibility revenue – electricity

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Sold balancing power	2 793	1 702	2 794	1 703
Sold remaining power	66	59	66	59
Sold supportive power	125	92	125	92
Sold regulation power	247	166	247	166
Peak-power reserve	151	189	151	189
Ediel	6	18	6	18
<b>Total</b>	<b>3 388</b>	<b>2 226</b>	<b>3 389</b>	<b>2 227</b>

Sold balancing power is for invoiced income for the imbalance that balance providers have caused in the national electricity system.

## Note 3 Contingency planning

### Grants accounts for the parent entity:

Political area Total defence (TSEK)	Opening amount amount	Allocation for the year as per official appropriate documentation	Total disposable funds	Expenses	Closing amount
<b>7:5 Emergency preparedness</b>					
- Appropriation item 3, Electricity emergency measures	1 185	248 501	249 686	- 239 655	10 031

In addition to appropriations, grants have also been received from the Emergency Management Authority and the National Post and Telecom Agency for an amount of SEK 13,047 thousand, of which SEK 707 thousand is non-utilized funds from the previous year. Of these SEK 12,963 thousand were utilized.

For this appropriation, there is also a framework for authorisation. Undertakings that result in future expenses are given in the following table.

Allocated framework for outstanding undertakings, TSEK	Constituent undertakings	Outstanding undertakings	Forecast 2007	2008	2009
178 200	103 997	174 378	81 477	54 805	38 456

The grants consumed during the course of the year amounting to SEK 253 (259) million have been used for the training of conscripts, as a contribution to the emergency reserve, for the purchase of equipment for immediate repairs in connection with powerline failures in grid and regional networks, mobile command support for crisis management, purchase of equipment for immediate repairs in connection with powerline failures and measures in power plants to permit island operation.

## Note 4 Activated work for own account

This item concerns labour costs for Svenska Kraftnät's own personnel that are activated against investment projects. Investment projects refer on the one hand to construction work in progress and on the other to activated IT development projects.

MSEK	Group and Parent entity	
	2006	2005
Construction work in progress	18	16
Activated development of computer programs	6	9
<b>Total</b>	<b>24</b>	<b>25</b>

## Note 5 Staff

The average number of employees during 2006 was in the group 282 (277), of whom 280 (275) in the parent entity and 2 (2) in the SwePol Link Group.

The distribution between men and women at year-end can be seen from the table below.

MSEK (Number)	Group		Parent entity	
	2006	2005	2006	2005
Women	86	77	85	76
Men	203	199	202	198
<b>Total</b>	<b>289</b>	<b>276</b>	<b>287</b>	<b>274</b>

The Group's staff expenses amounted to 208 (210), of which the payroll costs were 131 (128). To this shall be added social fees of 73 (71). Included in these amounts are pension costs of 22 (28). The decrease in relation to last year is due to the fact that the pension provision brought forward has been adjusted down by SEK 8 million on account of completed updating. The remaining amounts are other personnel expenses. During the year the parent entity has received SEK 1.7 million in funding from the National Board of Trade to employ young academics.

The fee paid to the Chairman of the Board amounted to SEK 78,996. The fees paid to other Board members have amounted to SEK 52,992 per member for the whole year. No fees are paid to Board members who are employed within Svenska Kraftnät, apart from their normal salaries.

The Director General's salary amounted to SEK 1.2 (1.1) million and the pension expense for the year to SEK 0.5 (0.6) million. The Deputy Director General's salary amounted to SEK 1.0 (0.9) million. As far as the Director General is concerned, pension conditions concur with the Ordinance (2003:55) on state pensions for managerial staff and follow the conditions of PA-91.

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

	2006	2005
Women	2	2
Men	5	5
<b>Total</b>	<b>7</b>	<b>7</b>

## Note 6 Other operating expenses

MSEK	Group		Parent entity	
	2005	2004	2005	2004
Energy crediting	366	347	366	347
Operation & maintenance	261	231	233	198
Leases on fixed assets	45	59	45	59
Transit	142	155	142	155
System operation services	330	198	358	229
Peak-power reserve	133	165	151	186
Own contingency planning costs	8	11	8	11
Research and development	22	12	22	12
Contingency planning costs	190	196	203	207
Other	154	157	124	119
<b>Total</b>	<b>1 651</b>	<b>1 531</b>	<b>1 652</b>	<b>1 523</b>

Included in System operation services are costs for counter-trade provided by Balance Service amounting to SEK 63 (54) million. The item Other includes payments to accountants in the following amounts:

Fees and expenses MSEK	Group		Parent entity	
	2006	2005	2006	2005
Swedish National Audit Office	0.8	0.8	0.8	0.8
Other auditors, Ernst & Young	0.2	0.4	-	-
<b>Audit</b>	<b>1.0</b>	<b>1.2</b>	<b>0.8</b>	<b>0.8</b>
Consultation, Deloitte & Touche	0.3	-	0.3	-
Consultation, Ernst & Young	-	1.3	-	-
<b>Total</b>	<b>1.3</b>	<b>2.5</b>	<b>1.1</b>	<b>0.8</b>

Auditing comprises examination of the annual accounts and book-keeping as well as the administration of the Board of Directors and the Director-General/Managing Directors and other tasks that fall within the responsibility of the parent entity/company's auditors to perform. Included among other tasks are consultations in subsidiaries.

## Note 7 Share of income from associated companies

Share of income from associated companies is reported after tax. The share of income from the other associated companies was less than 1 MSEK.

MSEK	Group	
	2006	2005
Nord Pool ASA	36	24
Nord Pool Spot AS	10	5
STRI	1	-
Kraftdragarna AB	1	1
<b>Total</b>	<b>48</b>	<b>30</b>

## Note 8 Business segments

MSEK	Group			
	Operating revenue		Operating income	
	2006	2005	2006	2005
Network	3 074	3 308	677	801
System responsibility – electricity	3 388	2 226	-41	56
Telecommunications	99	98	31	18
System responsibility – natural gas	36	8	7	-1
Renewable electricity certificates	20	18	14	8
Associated companies	-	-	48	30
Contingency	253	259	0	0
Segment elimination	-32	-32	-	-
<b>Total</b>	<b>6 838</b>	<b>5 885</b>	<b>736</b>	<b>912</b>

The predominant business segments within the Group are Network and System responsibility – electricity. Included in the operating income are the business segments' external revenue and expenses. Activated own work is included in Network, see note 4.

Some items concern both the business segments Network and System responsibility for electricity. When it has not been possible to link these activities to a business segment, the costs have been distributed on a standard basis.

Business segment Telecommunications has performed services for Network for SEK 32 (32) million, which is reported as operating revenue for Telecommunications and a corresponding increase in operating expense for Network. Activated own work is included in the Network business segment's revenue at an amount of SEK 24 (25) million.

Within business segment System responsibility for electricity, the balance providers have agreements with the parent entity on frequency maintenance and settlement of their imbalances. Profit trends are shown below for the years 2006 and 2005 in the parent entity.

MSEK	Parent entity	
	2006	2005
<b>Operating revenue</b>		
Balancing power revenue	3 232	2 017
Peak-power reserve	151	189
Ediel	6	18
Other system revenue	0	3
<b>Total operating revenue</b>	<b>3 389</b>	<b>2 227</b>
<b>Operating expenses</b>		
Balancing power expenses	-3 023	-1 830
System operation, primary regulation	-190	-89
Disturbance reserve	-42	-34
Peak-power reserve	-151	-186
Ediel	-4	-19
Other expenses	-20	-28
Depreciation	-1	-1
<b>Total operating expenses</b>	<b>-3 431</b>	<b>-2 187</b>
<b>Operating income</b>	<b>-42</b>	<b>40</b>

Return on capital employed for the group is 9.0 %. The predominant proportion of the capital employed belongs to the Network business segment.

#### Note 9 Result from securities and receivables accounted for as fixed assets

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Dividend on shares and participations in associated companies	-	-	19	18
Interest income	6	5	11	11
Exchange rates differences	-4	4	-4	4
<b>Total</b>	<b>2</b>	<b>9</b>	<b>26</b>	<b>33</b>

#### Note 10 Interest income and similar items

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Interest income	3	5	2	2
Exchange rate differences	0	0	0	0
<b>Total</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>2</b>

#### Note 13 Intangible fixed assets

Intangible fixed assets consist of land rights in the form of easements and line rights, rights of use for fibre-optic cables, licences and capitalised expenditure for computer programs.

Group and Parent entity	Capitalized expenditure for computer programs	Land rights	Rights of use for fibreoptic cables	Construction in progress	Total
<b>MSEK</b>					
Opening acquisition value	30	170	65	71	336
Acquisitions	-	0	-	37	37
Sales/disposal	-	-	-	-	0
Reclassifications	22	-	-	-24	-2
<b>Closing accumulated acquisition value</b>	<b>52</b>	<b>170</b>	<b>65</b>	<b>84</b>	<b>371</b>
Depreciation brought forward	18	99	12	-	129
Sales/disposal	-	-	-	-	-
Depreciation for the year	10	4	4	-	18
<b>Accumulated depreciation carried forward</b>	<b>28</b>	<b>103</b>	<b>16</b>	<b>0</b>	<b>147</b>
<b>PLANNED REMAINING VALUED CARRIED FORWARD</b>	<b>24</b>	<b>67</b>	<b>49</b>	<b>84</b>	<b>224</b>
Depreciation previous fiscal year	10	4	4	-	18

#### Note 11 Interest expenses and similar items

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Interest expenses, National Debt Office loan	14	2	14	2
Interest expenses, Other loans	43	40	0	0
Interest expenses, Pension debt	5	5	5	5
Capitalised interest for new construction	-4	-4	-4	-4
Exchange rates differences	1	-41	1	0
Translation difference	0	40	0	0
Other financial expenses	1	1	1	1
<b>Total</b>	<b>60</b>	<b>43</b>	<b>17</b>	<b>4</b>

#### Note 12 Tax on income for the year

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Current tax	-2	-1	0	0
Deferred tax	-3	-2	0	0
<b>Total</b>	<b>-5</b>	<b>-3</b>	<b>0</b>	<b>0</b>

Since the majority of the Group's income before tax is earned in the parent entity, which is relieved from income tax, no account is given of the connection between the tax expense for the year and the reported income before tax in the Group.

## Note 14 Tangible fixed assets

<b>Group</b>	<b>Buildings and land</b>	<b>Machinery and other technical facilities</b>	<b>Construction in progress</b>	<b>Total</b>
<b>MSEK</b>				
Opening acquisition value	904	15 884	467	17 255
Acquisitions	0	5	436	441
Sales/disposal	-3	-211	0	-214
Depreciation in connection with disposal	0	-4	0	-4
Reclassifications	10	438	-446	2
<b>Closing accumulated acquisition value carried forward</b>	<b>911</b>	<b>16 112</b>	<b>457</b>	<b>17 480</b>
Depreciation brought forward	380	8 220	-	8 600
Sales/disposal	-3	-209	0	-212
Depreciation for the year	36	511	0	547
<b>Accumulated depreciation carried forward</b>	<b>413</b>	<b>8 522</b>	<b>0</b>	<b>8 935</b>
<b>PLANNED REMAINING VALUED CARRIED FORWARD</b>	<b>498</b>	<b>7 590</b>	<b>457</b>	<b>8 545</b>
Depreciation previous fiscal year	36	494	-	530
<b>Parent entity</b>	<b>Buildings and land</b>	<b>Machinery and other technical facilities</b>	<b>Construction in progress</b>	<b>Total</b>
<b>MSEK</b>				
Opening acquisition value	429	13 549	466	14 444
Acquisitions	-	2	424	426
Sales/disposal	-3	-209	-	-212
Depreciation in connection with disposal	-	-4	-	-4
Reclassifications	10	432	-440	2
<b>Closing accumulated acquisition value</b>	<b>436</b>	<b>13 770</b>	<b>450</b>	<b>14 656</b>
Depreciation brought forward	257	7 598	0	7 855
Sales/disposal	-3	-209	-	-212
Depreciation for the year	13	392	-	405
<b>Accumulated depreciation carried forward</b>	<b>267</b>	<b>7 781</b>	<b>0</b>	<b>8 048</b>
<b>PLANNED REMAINING VALUED CARRIED FORWARD</b>	<b>169</b>	<b>5 989</b>	<b>450</b>	<b>6 608</b>
Depreciation previous fiscal year	13	376	-	389

The item Machinery and other technical facilities includes in particular switchyard equipment, power cables, submarine cables, control equipment, fibre-optic activities as well as telecommunications and information systems. Disposals arise primarily in connection with the commissioning of facilities after reinvestments.

The tax value for properties in the Group amounts to SEK 361 (361) million. In the group, the subsidiary Svenska Kraftnät Gasturbiner AB has received appropriation funds of SEK 17 (0) million for an investment of SEK 17 million in the gas turbine plant in Arendal, Göteborg.

## Note 15 Shares and participations in Group companies

<b>Company</b>	<b>Corporate number</b>	<b>Domicile</b>	<b>Share, %</b>	<b>Quantity</b>	<b>Nominal value, MSEK</b>	<b>Book value, MSEK</b>
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
<b>Total</b>					<b>12</b>	<b>12</b>

## Note 16 Shares and participations in associated companies

Company	Corporate number	Domicile	Share %	Quantity	Book value, MSEK	
					Group	Parent entity
Nord Pool ASA	NO 965662952	Lysaker	50	100 000	326	172
Nord Pool Spot AS	NO 984058098	Lysaker	20	2 880	17	0
Stri AB	556314-8211	Ludvika	25	375	7	4
Kraftdragarna AB	556518-0915	Västerås	50	5 000	6	1
Elforsk AB	556455-5984	Stockholm	25	750	1	0
Triangelbolaget D4 AB	556007-9799	Stockholm	25	525	0	0
<b>Total</b>					<b>357</b>	<b>177</b>

The acquisition value is the same as the book value in the parent entity. Svenska Kraftnät owns a further 10 % of Nord Pool Spot AS via Nord Pool ASA.

## Note 17 Current receivables

MSEK	Group	
	2006	2005
Accounts receivable	230	274
Receivables from associated companies	4	4
Other receivables	24	53
Receivable from the public utility's overdraft facility	48	49
<b>Total</b>	<b>306</b>	<b>380</b>

## Note 18 Receivable from the public utility's overdraft facility

The receivable carried forward of SEK 48 (49) million consists of the difference between withdrawn/deposited funds from the public utility's overdraft facility and deducted expenses/deposited income against the Government budget as follows:

(TSEK)	Group and Parent entity	
	2006	2005
<b>Opening balance (receivable +, liability -)</b>	<b>48 708</b>	<b>31 393</b>
Settled against Government budget:		
Appropriation	239 655	247 315
Income titles, dividend and small-scale energy	-1 573 000	-337 000
Settled against public utility's overdraft facility:		
Appropriation funds withdrawn	-240 000	-230 000
Dividend paid in	1 573 000	337 000
<b>Balance carried forward</b>	<b>48 363</b>	<b>48 708</b>

## Note 19 Prepaid expenses and accrued income

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Prepaid expenses	14	12	14	8
Accrued income, network	292	206	292	206
Accrued income, system	97	168	97	168
Accrued income, other	9	10	8	10
<b>Total</b>	<b>412</b>	<b>396</b>	<b>411</b>	<b>392</b>

## Note 20 Interest-bearing long-term liabilities

MSEK	Group		Parent entity	
	2006	2005	2006	2005
Liability to National Debt Office	709	0	709	0
Loans, other external	1 251	1 333	0	0
<b>Total</b>	<b>1 960</b>	<b>1 333</b>	<b>709</b>	<b>0</b>

The liability to the National Debt Office is for the current bank overdraft. Of the other external loans, a total of SEK 558 (639) million falls due for payment after five years in the case of the Group and SEK 0 (0) million for the parent entity.

## Note 21 Provision for pensions

MSEK	Group and Parent entity	
	2006	2005
<b>Opening balance</b>	<b>240</b>	<b>220</b>
Adjustment for pension liability reported at too high a level previously	-8	-
Pensions paid	-4	-3
Annual indexation	19	21
Payment of payroll tax for previous year	-	-4
Provision for payroll tax	6	6
<b>Balance carried forward</b>	<b>253</b>	<b>240</b>

## Note 22 Interest-bearing current liabilities

<b>MSEK</b>	<b>Group</b>	
	<b>2006</b>	<b>2005</b>
Liability to National Debt Office	0	0
Short-term part of long-term, loan, other external	98	98
<b>Total</b>	<b>98</b>	<b>98</b>

## Note 23 Accrued expenses and prepaid income

<b>MSEK</b>	<b>Group</b>		<b>Parent entity</b>	
	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>
Accrued expenses, balancing power	113	115	113	115
Accrued expenses, transmission losses	62	91	62	91
Accrued expenses, energy crediting	37	42	37	42
Accrued expenses, power reserve	11	11	11	11
Transit, net	29	25	29	25
Accrued salaries	24	25	24	25
Accrued leases on fixed assets	10	10	10	10
Accrued maintenance expenses	46	22	46	22
Accrued contingency expenses	13	29	13	29
Accrued expenses, natural gas	1	5	1	5
Accrued interest expenses	8	2	0	0
Accrued fuel expenses	12	-	-	-
Accrued expenses, other	10	13	6	15
Prepaid income, fibre-optics	13	5	13	5
Prepaid income, other	1	0	1	0
<b>Total</b>	<b>390</b>	<b>396</b>	<b>366</b>	<b>395</b>

## Note 24 Contingent liabilities

A guarantee has been issued for a loan of SEK 20 (20) million to Stri AB for the acquisition of a property.

In the parent entity's assessment, Svenska Kraftnät and its subsidiaries are not party to any legal material proceedings that could have a significant negative impact on the Group's result.

## Note 25 Future leasing commitments

Agreed future leasing fees fall due for payment as indicated below. All rental agreements are operational leasing agreements. The amounts in the case of the parent entity also include commitments to the subsidiary Svenska Kraftnät Gasturbiner AB.

<b>MSEK</b>	<b>Group</b>		<b>Parent entity</b>	
	<b>2006</b>	<b>2005</b>	<b>2006</b>	<b>2005</b>
Within one year	233	230	283	284
Later than one year but within five years	312	442	480	610
Later than five years	6	6	132	174
<b>Total</b>	<b>551</b>	<b>678</b>	<b>895</b>	<b>1 068</b>





Milkwort thrives in the open environment that the powerline corridor provides.

# Proposed disposition of earnings

and adoption of income statements and balance sheets

The Group's non-restricted equity amounts to SEK 2,579 million, of which the result for the year amounts to SEK 676 million. Of the parent entity's non-restricted equity of SEK 2,314 million, of which the result for

the year amounts to SEK 638 million, it is proposed that SEK 439 million is allocated for dividend in accordance with the dividend policy and that the surplus be carried forward.

The board suggests that the parent entity's income statement and balance sheet as well as the Group's income statement and balance sheet are adopted for 2006.

Stockholm 22 February 2007

Sven Hulterström  
*Chairman*

Jan Magnusson  
*Director General*

Anna-Stina Nordmark-Nilsson  
*Deputy Chairman*

Tomas Bruce

Bo Diczfalusy

Annelie Hulthén

Christer Samuelsson

Agata Persson  
*Staff representative*

Sture Törnstam  
*Staff representative*

## Auditor's report for the Svenska Kraftnät public utility

The Swedish National Audit Office has audited the public utility Svenska Kraftnät's annual accounts and consolidated accounts agreed on 22 February 2007, for the financial year 2006.

The management of the public utility Svenska Kraftnät is responsible for ensuring that the operations are conducted efficiently and constitutionally. This responsibility includes ensuring that the Government receives reliable feedback on the operations in the annual accounts.

It is the responsibility of the Swedish National Audit Office, in accordance with good auditing standards, to examine the public utility's annual accounts. The purpose of the inspection is to judge whether the

accounts and underlying accounting records are reliable and the books true and correct, and whether the administration of the management follows applicable regulations and special Government decisions.

The audit has been conducted in accordance with sound auditing standards. These standards require that the audit be planned and conducted with the aim of obtaining reasonable grounds to assess whether the annual accounts and the consolidated accounts are true and correct. The audit has thus been made on a selection of important transactions and administrative decisions.

The National Audit office deems that the audit carried out has provided reasonable grounds on which to base the following

statement. The annual accounts and the consolidated accounts have been prepared in accordance with the Ordinance on annual accounts and budget data, the Government's appropriations document and other rulings relating to the public utility.

The Swedish National Audit Office deems that the annual accounts are in all essential respects true and correct.

Audit Director Göran Selander made the decision in this matter. Audit Manager Anne Bryne contributed with the decision.

The Auditor's Report of the National Swedish Audit Office was submitted on 28 February 2007.

Göran Selander

Anne Bryne

# The Board of Directors



**Sven Hultström, Chairman**

born 1938, appointed 2003.

*Other directorships:* Chairman of AB Stokab.



**Anna-Stina Nordmark-Nilsson,  
Deputy Chairman since 2006**

born 1956, appointed 2004.

Director of health care services, Stockholm County Council.

*Other directorships:* Chairperson of the Novum Foundations Centre at the Karolinska Institute. Board member of Diös Fastigheter AB, Svea Skog AB.



**Tomas Bruce**

born 1944, appointed 2004.

Managing Director, Svenska Kolinstitutet.

*Other directorships:* Chairman of Capital Cooling Europe AB, Svenska Orienteringsförbundet. Board member of AB Borlänge Energi, Mobotec Europe AB, Gaia Leadership AB.



**Bo Diczfalusy**

born 1952, appointed 2005.

Director, The Ministry for Industry, Employment and Communications.

*Other directorships:* IEA (International Energy Agency).



**Anneli Hultén**

born 1960, appointed 2006

Municipal commissioner, Göteborg City.



**Christer Samuelsson**

born 1954, appointed 2001.

MD and Partner,  
Sensa Corporate Advisors AB.



**Jan Magnusson,**

born 1948, appointed 1998.

Director General, Svenska Kraftnät.

*Other directorships:* Chairman of Nord Pool ASA. Board member of Nordel, the National Swedish Agency for Government Employers.



**Agata Persson**

born 1946, appointed 2004.

Staff representative.

Representative of the Swedish Confederation of Professional Associations SACO.



**Sture Törnstam**

born 1947, appointed 2005.

Staff representative.

Representative of the Swedish Federation of Civil Servants ST.

# Svenska Kraftnät's research and development operation

The aim of Svenska Kraftnät's research and development activities is to make our national grid and system responsibility operations even better with respect to reliability performance, efficiency and environmental adaptation. We also participate in research that concerns the long-term development of the electricity market and electrical systems. Development of knowledge and expertise in conjunction with the universities and industry is also a prioritised area. We also support research and development within the fields of dam safety, as well as risk- and vulnerability issues for the power system.

## Plan for research and development

Svenska Kraftnät's plan for research and development indicates the focus and priorities for the next four years. The plan is updated annually and published on our website, [www.svk.se](http://www.svk.se), under the heading "Our activities". The budget for research and development was SEK 35 million for 2006. The actual figure was somewhat lower as a number of projects did not start as planned. The distribution between research and development was:

- Research, i.e. doctoral projects or commissioned research by senior researchers at universities, colleges and consultants, was budgeted at SEK 13 million. The actual figure was around SEK 12 million.
- Development, i.e. that which is intended to be implemented in the near future, was budgeted at nearly SEK 22 million. For various reasons several projects have been deferred or have not taken place, so the actual figure has only been in the region of SEK 15 million.

## Prioritised areas

Svenska Kraftnät's activities within research and development can be grouped into a number of important areas.

### Increased utilization of the system

Better knowledge of the overload capacity in equipment and powerlines is important to enable us to make even better use of our facilities, with respect to both reliability performance and economy. A number of projects have been undertaken to increase knowledge, and in several cases the results have led to new rules for permitted overload. Another area is research and development that involves use of power electronics to control the flows of electrical power, voltage control and power system stability.

### Robustness and increased reliability

New sensor technology and broad band communication between transformer stations and control centres provide the possibility of developing monitoring systems that work in real time with regard to both Nordic power systems and equipment in individual transformer stations. This is expected to lead to increased robustness and reliability performance for the national grid.

Society's dependence on a well functioning electricity supply has increased. Development of methods for risk analysis of electricity supply is therefore an important field of research.

### Environmental impact

Development projects that reduce the environmental load from our operations are a high priority.

Svenska Kraftnät is participating in studies to increase knowledge about the potential effect of electrical and magnetic fields on

the health of human beings, and to develop technologies to reduce the magnetic field.

Reducing the use of SF<sub>6</sub> gas and mineral oils that are toxic to the environment and replacing them with permanent (dry) insulation is one of Svenska Kraftnät's goals. For some equipment for 400 kV there is currently no replacement for SF<sub>6</sub>. The gas is a major contributor to the greenhouse effect, which is why it is also important to develop methods to minimise leaks of this gas.

The power system of the future will probably have a distribution of various types of generation that is different to that of today. An extensive introduction of small-scale, geographically dispersed electricity generation will present the power system and Svenska Kraftnät with fresh challenges. We are therefore taking part in national, Nordic and European research projects that involve consequences and opportunities for power systems that have a large proportion of this kind of electricity generation, e.g. wind power.

### New and improved information and operating systems

Reliability performance, personal safety and economy in the electrical power system can be further improved through research and development of information and operational support for operating staff. We are facing an upgrading of the current operation monitoring system and an introduction of new expert systems. Essential development inputs are being made in advance of this upgrading.

Svenska Kraftnät has itself developed a power system simulator, ARISTO, which is continually being further developed. We will give more details of this at the end of this article



Using the ARISTO power system simulator, which has been developed within Svenska Kraftnät, we are training personnel from other companies and our own staff.

### Maintenance

Svenska Kraftnät has fixed assets with a replacement value of about SEK 30 billion. Effective maintenance methods and aids are extremely important as they increase the accessibility of the facilities and prolong their service life. Research and development within this area is generally conducted in collaboration with other network companies. For projects that only involve 220 kV and 400 kV we have an established collaboration with other Nordic national grid companies. For example, a joint development project is in progress to develop methods for maintenance of equipment and powerlines without taking them out of operation.

### Dam safety

Svenska Kraftnät is the supervisory supporting authority for dam safety in Sweden. Within the framework of this role, we also support research and development to maintain and improve knowledge within the field.

Together with the Swedish Energy Agency, power companies and universities, we participate in the Swedish Hydro Power Centre, a centre for higher education and research within the field of hydroelectric power and dams.

### Long-term skills provision

Research and development within electrical power technology has been successful in

Sweden and is important for both the power companies and the manufacturing industry. Maintaining and developing the high scientific level in both undergraduate and postgraduate studies is an important goal in itself.

Svenska Kraftnät is participating in four research programmes together with the Swedish Energy Agency, the power companies and the manufacturing industry:

- Elektra, a university programme within applied electrical engineering that supports postgraduate studies, comprises SEK 18 million per year, of which Svenska Kraftnät's contribution is SEK 2.5 million.
- There are a number of projects underway at the Competence Centre for Electrical Systems (EKC) at The Royal Institute of Technology. The budget is SEK 18 million per year. Svenska Kraftnät is contributing SEK 650,000 million.
- The Swedish Hydro power centre. The budget is SEK 18.4 million per year, of which our contribution was SEK 2.2 million in 2006.
- Market Design, research into the development of the electricity market. The budget is SEK 2 million per year, of which Svenska Kraftnät is contributing SEK 700,000.

### Implementation of projects

The bulk of our research and development is carried out through commissions to the jointly owned development companies Stri and Elforsk.

Elforsk is the power companies' joint R&D broker and is owned by Swedenergy (75 %) and Svenska Kraftnät (25 %). Research and development that is common to the industry is prepared and coordinated by Elforsk. Projects in which Svenska Kraftnät participates are co-financed with other power companies and in several cases also by funding from the Swedish Energy Agency.

Stri in Ludvika has a testing laboratory for high voltage and carries out tests of equipment and advanced development services. Svenska Kraftnät owns 25 % of Stri, other co-owners are ABB (50 %), Statnett (12.5 %) and Vattenfall (12.5 %). Our development projects at Stri are often carried out in collaboration with other Nordic national grid companies and with ABB.

Sweden has a long tradition of successful research, development and demonstration within the field of electrical transmission in collaboration between the power companies and the manufacturing industry. This activity is important for Svenska Kraftnät. We collaborate with the manufacturing industry in Sweden in both university research and

development projects. A number of demonstration projects involving newly developed technologies have been carried out in collaboration with ABB.

## Two successful development projects

Here is an account of two major projects that have taken several years from the research and development phase to full implementation in our operation.

### Methods to reduce the national grid's corona losses

Energy losses occur when electricity is transmitted. In the national grid these normally comprise some 2 % of the energy transmitted. The predominant losses are resistive, i.e. those which are due to the current heating up powerlines etc.

There is also another type of losses, especially under winter conditions, so-called corona losses. These appear primarily where there are irregularities in the powerlines, which result in the electrical field around the line becoming stronger at certain points and thereby becoming unevenly distributed. If the field becomes sufficiently strong, local discharges are formed. These are heard as crackling noises from small flashes, which

create a weak bluish aura around the lines that can sometimes be seen in the dark. The discharges entail energy losses but also radio disturbances close to the lines, especially in the medium and long wavebands.

In conditions of hoarfrost during the winter there can be substantial power losses, up to about 100 kW per km of powerline. On one occasion when there was an abundance of wet snow falling, a power loss of 140 kW/km was measured during a period of a few hours for a 400 kV powerline. In December 2006, during a 12 hour period, an average of 32 MW corona losses were measured for a powerline, with two peak hours of 40 MW each!

About ten years ago an ambitious research and development project was started with the goal of reducing corona losses in winter by means of operational measures. This work, which has been carried out in close cooperation with Stri, has had the following principle aims:

- To produce an updated general understanding of the corona phenomenon, especially corona losses during hoarfrost.
- Through basic research and laboratory tests, to ascertain the connection between corona losses and determining variables (voltage, ambient temperature, air humidity etc.) when there is hoarfrost.

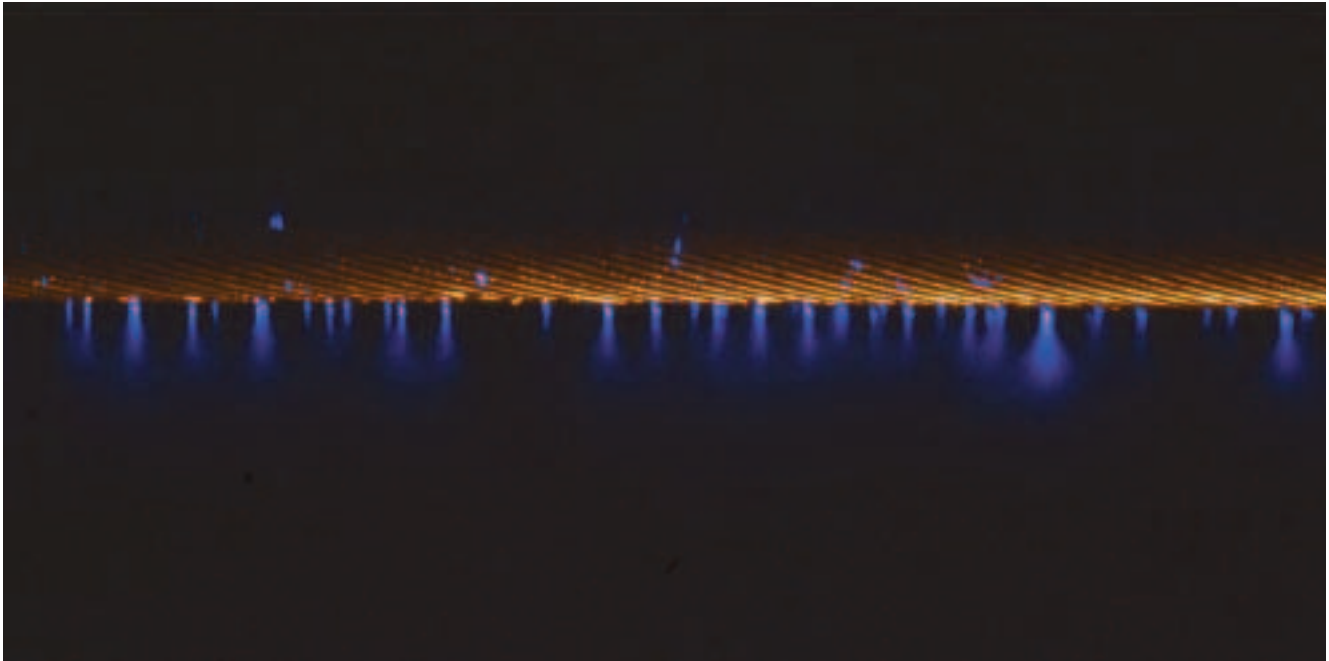
- Create operational tools for Svenska Kraftnät to operate the national grid to increase the chances of reducing corona losses.

Starting in the winter season 1999/2000 the operative methods in running the national grid have been gradually developed to reduce corona losses. The main principles and methods involved in this work, which is being carried out via Svenska Kraftnät's operational monitoring system, are indicated below.

- Using the values from measurements that are taken in real time, the corona losses from various powerlines are calculated on a continuous basis.
- When the corona losses permanently exceed a certain level, measures are taken if it is possible from an operational safety perspective, and if the measures bring about a clear reduction in the national grid's overall losses.
- The basic principle in the operational measures is to reduce the voltage level. During the night and at weekends there is sometimes a low level of transmission on the national grid. On these occasions the voltage can be lowered by disconnecting 400 kV powerlines with substantial corona losses from the grid. This reduces the corona losses twofold. Losses entirely disappear from the disconnected powerlines and there



The Combined circuit-breaker, that ABB has developed in collaboration with others, including Svenska Kraftnät.



The corona effect is being studied in cooperation with the research company Stri AB.

is some reduction in corona losses from the lines that are in operation due to the fact that the voltage level has been lowered.

Today corona losses are monitored on twenty-five 400 kV and two 220 kV power-lines with a combined length of about 6,400 km. The possibility of disconnection is used for eight 400 kV lines.

During 2006 about 2.6 GWh was saved at a value of approximately SEK 1 million.

#### **Development of a power system simulator**

Large electrical power systems such as that of Sweden and the Nordic countries are very reliable. The intervals between major disturbances, which nevertheless do occur, are long.

After a disturbance it is important to be able to rapidly and safely restore the power system. This requires that operational staff receive good training under as realistic conditions as possible. A simulator is consequently needed that simulates the power system's dynamic properties in real time. Svenska Kraftnät has developed a simulator, ARISTO, that can do this.

#### **From idea to practical application**

The idea for a simulator grew out of the experiences gained from the large-scale disruption in 1983. Would it be possible to simulate such complex circumstances in order to train operators? With the support of what was then the Swedish State Power Board, a research project was started at the

Royal Institute of Technology in Stockholm. In 1990 the project produced a prototype in which rapidly occurring faults could be simulated and studied at real time speed at a reasonable cost.

Svenska Kraftnät completed the first version of the simulator in 1993. Since 1996 it has been used to train the company's own staff and those of other companies. In parallel, a detailed network model of the entire Nordic power system has been developed. In connection with a new operational support system being put into operation, the simulator was integrated into the system. Since 2002 Svenska Kraftnät has thus had a training environment where the operators have a copy of their workplace and operation support system.

#### **Extensive development inputs**

Svenska Kraftnät recently initiated a new project to further develop the simulator. The project primarily comprises development of models, data management and performance enhancing measures. Efforts will also be made to further improve the training environment, i.e. the integration of ARISTO and Svenska Kraftnät's operational support system.

The models that are developed and introduced will be a combination of completely new ones and improved old ones. Examples are models for wind turbines, gas turbines, combined power stations, hydroelectric power stations, thermal power stations and facilities for DC transmission and reactive power as well as various types of models for

consumption.

#### **Great future potential**

With the development of ARISTO, Svenska Kraftnät has a unique resource. The vision is to be able to satisfy for many years to come the requirements and support that is expected from those who are currently using ARISTO, but also from new companies and users. Development and introduction of systems for decision support for the operators is one of several prioritised areas.

This is one of the largest development projects to have been undertaken by Svenska Kraftnät. Thus far a total of almost SEK 30 million has been put into the development. This includes development inputs by our own staff of about 20 man-years.

Research and development involving the simulator and its application will proceed for many years to come.

#### **The simulator is unique**

Detailed simulation enables both normal and extreme operating conditions to be covered. The interactive interface and training in real time offers great freedom to test a variety of faults, and to demonstrate the consequences of the faults and the measures the operator takes.

The simulator is currently used by ten or so companies and universities in Sweden and abroad. Some of them have their own ARISTO system while others borrow the system. Another option is that staff are trained in Svenska Kraftnät's training environment.

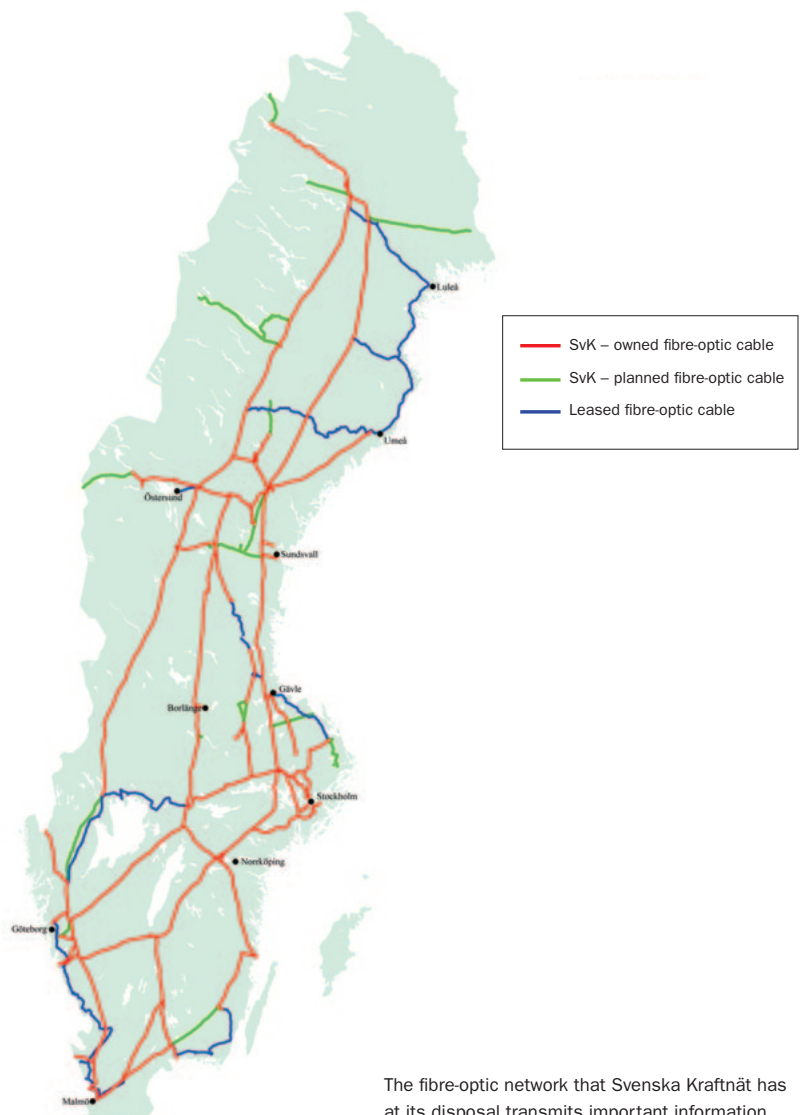
# Svenska Kraftnät's telecommunications network

Since 1994 Svenska Kraftnät has built up a nationwide telecommunications network based on fibre-optic cable that is installed in our powerlines. It currently extends from Malmö in the south to Ritsem in the north. In total we have access to a network that is approximately 8,500 km in length, consisting of 6,000 km of our own fibre-optic cable and 2,500 km that is leased. In addition, there is a small number of connections via radio link and carrier frequency. Together with these connections, the fiber-optic network forms the Operational Telecommunications Network. The network meets extremely stringent requirements with regard to availability and robustness.

The Operational Telecommunications Network is a necessity in maintaining and safeguarding operation and monitoring of the national grid for electricity. Among other things this includes protective functions, remote control and monitoring of power stations, and also spoken communication. All parts must function during both normal and disrupted operation of the grid.

## High level of requirements on availability

There are currently no public telecoms operators in the market who can meet the high level at which Svenska Kraftnät sets its requirements for availability and quality in telecommunications. The power stations are usually situated in remote places where public telecommunications are absent, or are only available as telephone connections on copper wire. It is particularly difficult, if not impossible, for a public telecoms operator to provide connections that meet the requirements that protecting the powerlines demands. The reserve battery time in the majority of public telecommunications stations is too short, often three hours, which is insufficient when there are disruptions to the national grid. To facilitate a rational restoration of the national grid after an outage requires auxiliary power systems for power



The fibre-optic network that Svenska Kraftnät has at its disposal transmits important information for monitoring and control of the electrical power system.



stations and telecommunications equipment with a reserve power capacity of at least 12 hours.

Another important aspect is that we need to maintain a very high level of IT security and naturally also a high level of physical safety.

The major stretches of line for the Operational Telecommunications Network have now been completed. They comply with current requirements for coverage, availability and security that Svenska Kraftnät places on operation of the electricity national grid. The Operational Telecommunications Network is also prepared to meet any increased requirements for robustness, availability and capacity that can conceivably arise in future national electricity supply. During the period 2007–2010 we plan to supplement the Operational Telecommunications Network with an additional 1,000 km, 700 km of which will be our own fibre-optic cable. Communication via radio link and powerline carriers will in the main subsequently be replaced with modern fibre-optic technology. However, a small number of radio links and carrier frequency connections will be retained for redundancy reasons.

The modernisation of the Operational Telecommunications Network means that the network as a whole can be monitored and controlled from a central location. Reliability performance will be substantially improved with modern equipment at the same time as maintenance will be streamlined, which will together lead to reduced operating expenses.

The performance of a fibre-optic network is currently dependent on which terminal equipment is used. Each fibre-optic pair can now transmit 10–20 times more information than just a few years ago. Svenska Kraftnät's own need is primarily not an extremely high capacity but instead a very high level of requirements on short response times in the signaling. Maximum delays of 250 milliseconds can be tolerated when it comes to certain protective functions. The previous capacity of 64 Kbit, equivalent to a telephone call, is no longer sufficient. Today we use capacity volumes of up to 620 Mbit. The requirement is expected to further increase in the future.

### Ring structure provides secure operation

The Operational Telecom Network is constructed in a ring structure so that all important stations are connected by at least two separate connections that are independent of each other. This means that an individual fault in the telecom network does not disrupt communication with an individual station. For control centres the requirement is even higher.

A stage in the development of the Opera-



Svenska Kraftnät collaborates with Vattenfall Eldistribution, among others, with regard to issues that involve telecommunications.

tional Telecom Network is the extension of a WAN network (Wide Area Network) based on the fibre-optic network. The WAN network will replace ageing telecom equipment for transmission of voice and data. It is currently being extended to the stations that are equipped with fibre-optic cables or modern radio links, and also to several of the regional power companies' control centres and stations that are important in maintaining the national power supply. One of the aims of the WAN network is to safeguard important telecom and data traffic between power companies and the stations in the event of a national disruption, even if the public telecom networks are not working.

### Excess capacity is leased out

Svenska Kraftnät's fibre-optic network has been constructed with excess capacity in the form of a number of fibre-optics in each powerline. The cables we do not need for our own operation are leased out to external customers. The customers are usually large nationwide, regional or local telecom operators as well as power companies. Svenska Kraftnät primarily leases out so-called black fibre, which means that customers themselves connect active terminal equipment to the

fibre-optic cables. We also lease out capacity services to a lesser extent, principally within the electricity industry. The area of application is then usually monitoring and control of electricity networks.

Svenska Kraftnät's telecom network is completely separate from other telecom networks. It means that our telecom traffic is not affected by breakdowns in the public telecom network. It also transpires that fibre-optic networks on powerlines have fewer breakdowns than, for example, fibre-optics laid in the ground. It is fairly common that cables laid in the ground are damaged as a result of digging.

### Financial situation

The annual cost of the Operational Telecom Network amounts to about SEK 80 million, of which SEK 27 million is depreciation and SEK 53 million is expenses for operation, maintenance and leases (principally leased fibre-optic connections). The external revenue amounts to about SEK 66 million/year.

The cost of completing installation of the fiber-optic network during the coming years is calculated at a total of SEK 65 million.

# Our responsibility for the environment

It is important for Svenska Kraftnät that environmental issues are given great consideration when important decisions are made. Our ambition is to view environmental issues in a long-term sustainable perspective and to look for the best solution by balancing environmental aspects with social, technical and financial aspects.

In investment projects it is often possible to combine consideration for the environment with reliable technology and a good financial situation. On the other hand, the projects' impact on the environment is sometimes so complex that different environmental aspects are in conflict with each other. During 2006 we have seen examples of local environmental aspects, such as the risk of oil polluting the ground, having to be weighed against global aspects such as the risk of affecting the climate. Similarly, we have been faced with the issue of whether the impact of a planned powerline on people's housing and local environment is a more important aspect than the impact of the same powerline on an undisturbed natural environment.

During the year we have been working to achieve satisfactory environmental solutions in many ways. These include measures to minimise impact on the climate, efforts to reduce the risk of emissions of hazardous substances, and working to benefit biological diversity. Here is a description of some of the environmental measures we have carried out during the year.

## **Environmental responsibility as the procuring party**

For a number of years we have been setting environmental requirements when we procure contractors for new building and conversions, as well as maintenance of stations and powerlines. Our ambition is that the environmental requirements we set will lead to consideration

of the environment permeating all stages of the construction and maintenance operations. In order that the requirements are perceived as relevant and reasonable, we have drawn them up together with some of the contractors who work on our commissions.

We have placed great importance on Svenska Kraftnät's project managers, managers and other key persons being well informed as to what the environmental requirements entail. Training courses have been implemented for all concerned, and tools that project managers can use for following up have been developed. During 2007 we will be conducting environmental audits in a number of contracts in order to check that the environmental requirements are being observed. The entire chain from steering group to project manager and contractor will be scrutinised.

## **Responsibility for a limited impact on climate**

There are about 19 tonnes of the greenhouse gas sulphur hexafluoride (SF<sub>6</sub>) in Svenska Kraftnät's stations. We are continually measuring how much gas is refilled into the equipment in order to detect and rectify abnormally high leakage.

During the year only 27 kg of gas has been used, which is equivalent to 0.1 % of the installed amount. This value is in line with the low values we had in 2003 and 2004 and considerably lower than the value for 2005. The extent of leaks is also clearly under the international standard value of 0.5 or 1.0 % that generally applies for new equipment. To maintain leaks at a low level we have implemented measures in several facilities during the year. When reactor circuit-breakers are overhauled, staff from our maintenance contractors participate and thereby acquire updated knowledge. Staff from the contractors have also attended courses

where handling SF<sub>6</sub> in the field has been an important component. It is important that the maintenance staff are properly trained to enable us to maintain a good reliability performance and avoid circuit-breaker failures.

For both financial and environmental reasons it is important that we do what we can to keep energy losses from the national grid as low as possible. Transmission losses constitute some 2 % of the energy that is supplied into the national grid. Starting one year ago, we have been able to measure the decrease in corona losses as a result of operational measures in our control rooms. In general, the measures consist of temporarily disconnecting certain powerlines. During 2006 this has enabled us to save 2.6 GWh, which also represents a financial saving of almost one million kronor. In the long term we anticipate being able to reduce energy losses by one to two percent (30–60 GWh) by using a new tool to minimise network losses.

We are also working on other energy saving measures. An action plan to reduce electricity consumption in several of the station facilities has been developed. A review of energy consumption has been carried out at Åsbro training centre. During 2007 a new heating control system will be installed with better possibilities for regulation.

In 2007 one of our environmental goals is to reduce carbon dioxide emissions due to business travel.

## **Prevention of hazardous emissions**

One of our most important environmental goals is to ensure that there are no emissions of hazardous substances. There are oil pits under all of Svenska Kraftnät's power transformers to collect the oil that can come out of the equipment in connection with breakdowns and leaks. Oil pits must be big enough to be able to deal with the entire amount of oil that is in the equipment. In



Sweden's first designer pylon, with Åreskutan in the background. (Photo montage)

addition there must be room for rainwater. The walls and floor of the pit must be oil- and water tight. Furthermore, there are requirements that the pits are correctly emptied. A programme of measures to raise the quality of the oil pits has been drawn up during 2006.

Some of Svenska Kraftnät's older powerlines are constructed from steel pylons that are painted with red lead. Studies and trials have been conducted to enable us to establish the best and most environmentally friendly way to maintain the pylons. To prevent flakes of paint that have a high lead content loosening and spreading in the powerline corridors, the flakes can be blasted off and the pylons painted with a new, lead-free top coat. Another alternative is to attach nets around the pylons to catch the flakes of paint as they gradually loosen.

We have commissioned an investigation into whether corrosion of copper from the longitudinal earth wires in the ground underneath the overhead lines constitutes an environmental problem. The results showed that corrosion of the copper wire makes a very minor contribution to the earth's natural copper content. The small amount of copper that is added does not affect plants and animals.

#### **Powerline corridors – a refuge for endangered species**

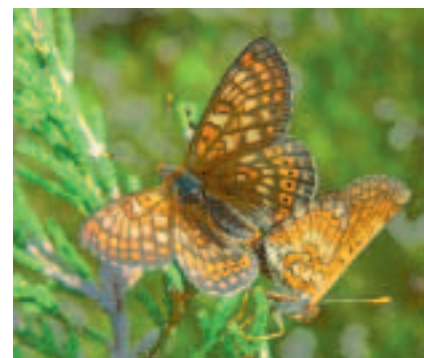
The area of grassland that is rich in species is diminishing in Sweden. Many plants that belong to the cultural landscape are endangered and along with them a large number of

plant-eating insects. However, powerline corridors that are cleared regularly have turned out to be a resource for conservation of species that are becoming extinct.

Svenska Kraftnät's objective is to benefit biological diversity by adapting the maintenance of powerline corridors to take account of sensitive habitats. During the year we have undertaken inventories of six sections of powerline with respect to species-rich biotopes. Our contractors' forest inspectors have performed the inventories. These individuals have previously been trained to identify locations with a high natural value and to propose appropriate maintenance for them.

Svenska Kraftnät has started cooperating with several county administrative boards and municipalities in the maintenance of species-rich areas in powerline corridors. Some of the areas have been identified as Natura 2000 areas. Two locations have recently been discovered in one of Svenska Kraftnät's powerline corridors in Örebro county where the endangered marsh fritillary butterfly is present. The marsh fritillary is a red-listed butterfly whose numbers have diminished sharply in Western Europe in recent years. Today it is only found in Sweden on Öland and Gotland, and locally in powerline corridors. The butterfly lives with Devil's-bit Scabious as its host. Devil's-bit Scabious is dependent on the open habitat that is maintained in the powerline corridors. Inventories are regularly carried out in Uppsala county of locations where there are marsh fritillary butterflies, most of which are found in powerline corridors. Svenska

Kraftnät has commissioned the Swedish University of Agricultural Sciences to carry out an inventory of species of plant-eating beetles that live in the powerline corridors in Uppland. We have also compared their presence in the powerline corridors with the



The marsh fritillary butterfly is rare and needs special protective measures to survive. It thrives in powerline corridors.

supply of beetles in other open land. The inventory was carried out during the summer by means of collecting species in six different areas. Within each area there was one habitat of each of the types powerline corridor, roadside verge and pastureland. According to the provisional results, there are no decisive differences in numbers of species between the different types of habitat. This indicated that powerline corridors can contain an equal abundance of species as other open ground.

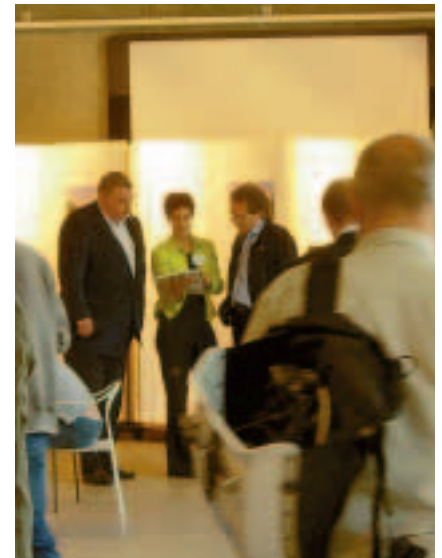


Species collecting entails dragging a collection bag through the vegetation and thus scraping off insects. 90 different species were found on this occasion.

competition with her proposal "Asymmetrical togetherness – an attendant relationship". Anna Cronheden has now been commissioned to further develop the pylon together with a designer so that it meets all the technical requirements.

Svenska Kraftnät's environment prize will be presented for the first time at the customer day in March 2007. The prize money amounts to SEK 100,000. Our ambition is that the environment prize will stimulate individuals and groups within research, businesses and other organisations into developing innovative solutions for our operations. It can involve methods, products and new knowledge that can lead to environmental improvements in our activities. Contributions might for example result in:

- use and emissions of hazardous substances decreasing
- transmission losses becoming lower
- energy use decreasing
- interventions in the natural environment and the visual impact of electricity facilities reducing
- exposure to electrical and magnetic fields reducing
- the abundance of species in the powerline corridors being enhanced.



The jury considered that the winning pylon "...is clearly visible, at the same time as it blends into the landscape in a natural and timeless way. The idiomatic and symbolic values are linked to local conditions and traditions as well as to Svenska Kraftnät's goals and activities." Picture from award ceremony.

### Design competition and environmental prize

In conjunction with the municipality of Åre and the Åre Design Centre, in spring 2006 Svenska Kraftnät announced a competition to give shape to Sweden's first designer pylon. The pylon will be erected at Brattland, just east of Åre. This is where the new 400 kV powerline between Järpströmmen in Jämtland and Nea in Norway is going to cross the E14 road. The mountain Åreskutan can be seen from the road, and the view is highly sensitive from a landscape perspective. The Åre artist, Anna Cronheden won the

Selected environmental data	2006	2005	2004
Energy losses, % of energy supplied to the grid	2.1	2.6	2.2
Reduced losses as a result of operational measures, GWh <sup>1</sup>	2.6	-	-
CO <sub>2</sub> emissions, own gas turbines, tonnes	4760	3805	1892
Amount of SF <sub>6</sub> gas added, kg	27	76 <sup>2</sup>	18.5
SF <sub>6</sub> gas emissions, tonnes CO <sub>2</sub> -equivalents <sup>3</sup>	599	1687	411
SF <sub>6</sub> gas emissions, proportion of installed quantity, %	0.1	0.4 <sup>4</sup>	0.1
No. of business trips/employee	10.3	10.2	9.9
Emissions of CO <sub>2</sub> , all business trips by air, tonnes	283	298	-
Emissions of CO <sub>2</sub> , all business trips, tonnes	428	-	-
% of company cars that are environmental cars	40	0	4
% of employees that feel that Svenska Kraftnät is an environmentally conscious company	-	74	-

1 Refers to corona losses

2 Of which 44 kg due to breakdowns

3 Values adjusted according to new international standard. The GWP value for SF<sub>6</sub> is 22200.

4 Emissions not due to breakdowns amounted to 0.2 %

# Stockholms Ström

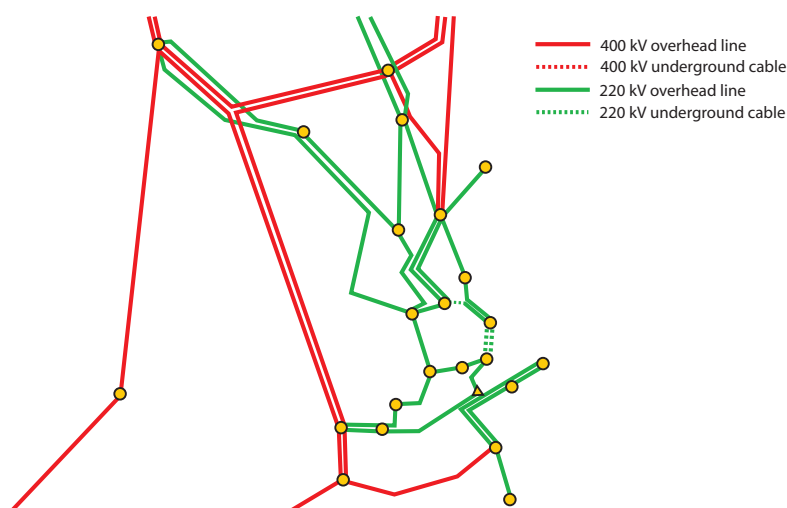
## – more secure electricity with fewer powerlines

In January 2004 Svenska Kraftnät was commissioned by the Government to investigate the future configuration of the national and regional grid in the Stockholm area. The work is being implemented in conjunction with the regional network owners, Vattenfall Eldistribution AB and Fortum Distribution AB, as well as the state and municipal planning authorities. An interim report was submitted in October 2005 with proposals for a structural plan for the network.

One aim of the enquiry is to adapt the network to today's demands from society and to create an even more secure electricity supply in the Stockholm region. Replacing a large number of overhead lines with fewer powerlines, the majority being cables in the ground or tunnels, also enables a large area of land to become available for other infrastructure or for housing.

### The enquiry

The study comprised the national grid (400 kV, 220 kV) and regional networks (110 kV, 70 kV) within Stockholm county. An initial stage analyzed the existing network's technical capacity. Networks of the kind that are relevant in this context are generally dimensioned in accordance with the so-called (n-1) criterion. It means that in the event of a fault it is possible that an arbitrary powerline, transformer or switchyard rail could be disconnected without any electricity customers noticing the disturbance. The (n-1) criterion is normally applied at the network's electrical level. In some cases when several cables are installed in the same tunnel or when there are several powerlines in the same pylon the criteria have to be applied at the canalisation level. It means that a study has to be made of the consequences of a tunnel fire or a col-



Present national grid in the Stockholm area (2006).

lapsed twin conductor pylon that can knock out several powerlines. Such an analysis has been conducted in the enquiry into Stockholm's future electricity supply. The principle aim is that the electricity network is better able to cope with severe faults.

The existing network was also analysed with respect to conflicts over use of municipal land, the impact on conservation interests from nature conservation, cultural conservation and outdoor life, as well as on the landscape. In addition, a calculation is made of the number of residents and children in schools and preschools within 200 m from the powerlines.

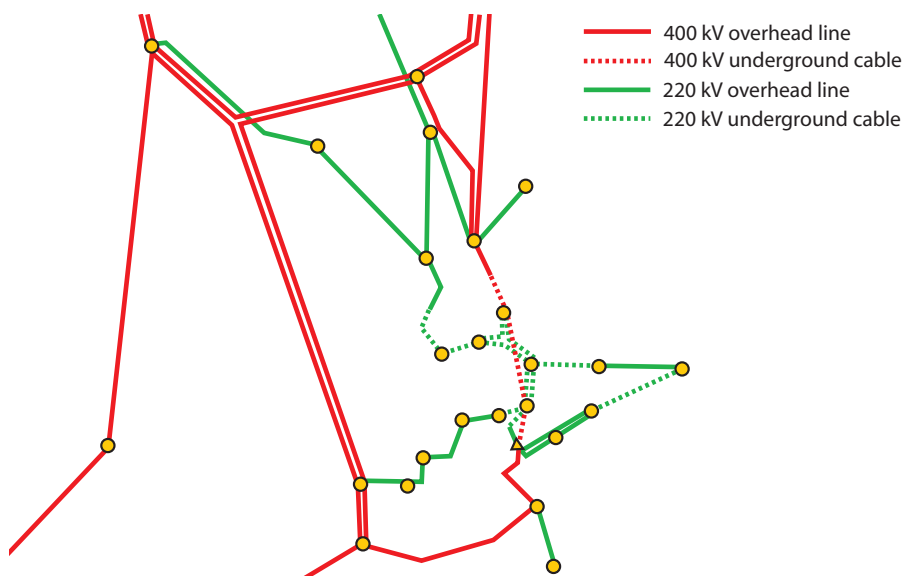
An important aspect when dimensioning the network is how large the maximum transmission requirement might be. Based on the 2001 regional plan for Stockholm county, a power forecast has been drawn up for 2030. Using this and the previously mentioned data, a proposal for a future electricity network for the Greater Stockholm region was produced.

### The future network

Implementing the new network structure requires some fifty construction projects of varying sizes to be carried out over a period of 10–15 years. The total construction cost is estimated to be SEK 3–4 billion. The backbone in the new network is a new 400 kV connection of approximately 40 km in length, primarily executed as a cable in the ground or a tunnel, between North Stockholm and Södertörn south of the city. The project is called CityLink. This connection will create a powerful 400 kV ring around the Stockholm area, which together with a number of further measures will mean that about 150 km of large powerlines can be dismantled.

The pared down 220 kV network will be supplied from three new 400/220 kV transformer stations at Danderyd, Skanstull and Högdalen.

The new network structure means that the Stockholm area will get an electricity network that in respect of capacity, reliability



Proposed future national grid in the Stockholm area (2020).

and the environment will be able to deal with the needs and requirements for a very long time to come. Security of supply will be substantially improved primarily in Stockholm's central and western districts. The network is designed in such a way that there will be great capacity to withstand severe faults.

Some 60,000 people who currently live less than 200 m from a powerline will have a local environment without powerlines. This represents a halving of the number of residents within this distance from a powerline. Furthermore, some 7,000 children in schools and day nurseries, who are presently within 200 m of powerlines, will have a local environment free of powerlines. A preliminary assessment made by the municipalities concerned, which constituted the data for the enquiry's interim report, shows that the powerline corridors that are uncovered can be used to build about 5,000 apartments.

Environmental issues have received particular attention when designing the future electricity network. Two development projects have commenced. One of the projects involves investigating the possibilities for replacing 220 kV and 400 kV oil-insulated cable terminals that are enclosed in porcelain with dry terminals enclosed in composite. This would produce a safer working environment and reduce the risk of environmental damage to the surroundings. The second project involves gas-insulated switchyards. These use SF<sub>6</sub> gas as the insulating material. The gas has extremely good electrical properties, but is a distinct greenhouse gas. There is normally extremely minor leakage of SF<sub>6</sub>, but the possibility of leakage can

not be excluded, particularly in the event of equipment failure or similar. The goal of the project that is now underway, is that in the event of a leak the gas will stay inside the facility to prevent any getting out into the atmosphere.

#### Projects in progress

Preplanning and processing of applications is underway for some of the projects that are included in Stockholms Ström.

The plan is to reinforce electricity supply to Lidingö and Värmdö by means of new

220 kV ground and sea cables from Värtan and Nacka respectively. New 220/70 kV transformer stations will be built at Koltorp on Lidingö and Gustavsberg on Värmdö. In connection with these developments, the 70 kV Danderyd–Koltorp line which runs past Lidingö's first, now shut down, power station at Kyrkviken, will be demolished.

An adaptation to the 220 kV network's new network structure south of the national grid station in Danderyd has also been commenced. The current powerline for 220 kV between the Danderyd station and Bergshamra (Solna) will be replaced by a 220 kV cable connection. The network is being reinforced through a new 220 kV cable extending Danderyd–Bergshamra–Järva.

The first section of the CityLink extending from Hagby (Upplands Väsby) to Danderyd is underway. From Hagby southwards a compact 400 kV overhead transmission line is being built in the power line corridor that is currently used for a 220 kV powerline. North of Skarpäng in Täby the powerline transfers to a cable, laid in the ground and in a tunnel, up to the new 400/220 kV transformer station at Danderyd.

In the longer term, the CityLink is planned to continue from Danderyd to Skanstull. A feasibility study is underway for this 400 kV connection, the plan for which is to build the entire route in a tunnel.

#### Financing

The total investment volume to establish a new network structure in the Stockholm area amounts to SEK 3–4 billion. The investment is profitable from the perspective of the national economy. The new electricity network will have a higher capacity and secu-



70 kV powerlines at Lidingö's first power station will be replaced by a buried 220 kV cable.



Stockholms Ström's project manager and the representative of the County Administrative Board in the steering group take a break in the work.

rity of supply. Energy losses in the network will be lower. The powerline corridors that are freed-up can be used for new housing. During the first six months of 2007 a detailed evaluation of the powerline corridors that will be released is being conducted in conjunction with the municipalities and landowners concerned. The idea is that the municipalities, which can grant building permission in the powerline corridors, will contribute to financing the conversion of the electricity network. Besides land for housing in attractive locations, this will generate an opportunity to improve the urban environment and reduce the number of people who live close to major powerlines without putting a burden on the normal municipal finances.

#### **Authorisation**

Building large powerlines requires permission (concession) in accordance with the Electricity Act and an enquiry under the Environmental Code. Normally the enquiry only covers individual power lines, weighing up the need for the powerline with the interference caused by the line. With Stockholms Ström, the overall structure of the electricity network is being changed. A number of major powerlines in several municipalities are going to be replaced with cables or overhead lines that in most cases follow a different route and affect municipalities other than those with the powerlines that are proposed to be dismantled. In other words, some of the benefits accruing from the project will be

in places other than where the replacement cables or overhead lines are being built. The new network should therefore be viewed as a whole. When Svenska Kraftnät has submitted the final report to the Government on 1 July 2007, an overall decision should be taken on the new network structure. It should subsequently be possible to carry out a simplified enquiry for each individual project in accordance with the Electricity Act.

# Stability and new thinking

A balanced age profile – a prerequisite for continued development

A third of Svenska Kraftnät's staff are over 55 years old. These are staff members who have a depth and breadth of knowledge about our operation. It is due to their merits that Svenska Kraftnät is a stable company that manages Sweden's electricity supply in an effective and professional manner.

Svenska Kraftnät is currently entering a phase of substantially increased investment in the national grid. There is therefore going to be an increased need of employees with a high level of expertise. At the same time many of our most experienced staff will be leaving the company due to retirement.

The company has formulated a clear strategy to deal with this challenge:

- Recruitment of young, qualified academics
- Planned transfer of skills from older to younger employees
- Regular trainee programme
- Inputs targeted at universities

"If it is the case that we can recruit young employees – who can do the job – then Svenska Kraftnät must not be afraid to do so", says Therese Fahlberg, a graduate engineer who started as a trainee at the company in 2004. "If the company's intention is to recruit young employees it is important that we are clear about it.", Therese continues. She is currently working on advanced power



Therese Fahlberg, Niklas Kallin and Christoffer Moberg are three of our younger employees who are contributing fresh ideas, at the same time as they are benefiting from the experience of our "old" staff members.

system analyses and she maintains that the mix of experience and youth contributes to the atmosphere in the workplace.

"I feel that we have a good climate for cooperation within the company. There is always somebody with greater experience who is willing to offer help if you need it. At the same time those of us who are younger can come up with new approaches and see other solutions to problems" Therese concludes.

Svenska Kraftnät deliberately focuses on generating meetings between younger staff and those who are older with more experience. We do this because the mix between fresh thinking and stability produces a strong dynamic, but also because we then create the conditions in which knowledge can be transferred.

"The older SvK-ers have knowledge that has to be passed on to us younger people",



says Christoffer Moberg, a graduate technician who works as a systems operator. He considers that the blend of experience and youth generates good communication and a breeding ground for exciting solutions. "I can really recommend Svenska Kraftnät for young people. The company can offer lots of interesting assignments and I see clear opportunities for development, in other departments too", says Christoffer, who started at Svenska Kraftnät in 2002.

Svenska Kraftnät recruited 26 new employees in 2006 – half women and half men. The average age of these new employees is 36.

What's it like being a new young employee at Svenska Kraftnät? The question is put to Niklas Kallin who was employed as one of six trainees during the year. He is a graduate engineer and Master of Business Administration, and after his trainee year he will be working on development of the electricity markets in both the Nordic region and Europe.

"I have already had some interesting and challenging assignments. I have colleagues who are first-rate, approachable and helpful, and I feel very welcome. Many of my colleagues express their pleasure about the fact that the company is employing young people."

It is clear that the meeting between expe-



Jakob Katzman started as a trainee in 2004. As the secretary of the Operation Committee he regularly meets representatives of other companies.

rience and youthful enthusiasm is generating a good level of creativity from which the company will derive substantial benefit. It is important that Svenska Kraftnät recruits

employees in the future who will enable us to further strengthen the emphasis on a balanced age profile.

# Power industry terms

## Ancillary services

Procured services, primarily from power producers, which are necessary for the technical operation of the system. These services primarily comprise frequency regulation and access to gas turbines as an emergency reserve.

## Balance power

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

## Balance provider

Company that has entered into a balance responsibility agreement with Svenska Kraftnät. Balance providers are obliged 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).

## Constraint

Congested sector on the grid or cross-border interconnectors where the capacity to transmit power is less than the demand.

## Counter trading

The purchase/sale of electricity 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.

## 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 provisionally-calculated deliveries to these customers. Final settlement means that the costs are redistributed between the balance providers.

## Final power

The difference between the actual, metered values after 14 months and the provisionally calculated values.

## Island operation

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

## Load frequency control

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

## Point of connection tariff

Charging model for utilizing the electricity network. The size of the charge is dependent upon, among other things, the connection point's geographical location.

## Profile settlement

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

## 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 protection

A system for boosting 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 transmission levels in constraint 4 (a line running approximately from Oskarshamn to Varberg) risk becoming too high.

## System-responsible authority (System Operator)

Responsible for the reliability and balance of the national electricity system. Svenska Kraftnät has this role in Sweden.

## Transit

The transmission, or transiting, of power via a "third country".

## Transmission losses

The energy losses occurring in a network.

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## Definitions

### Debt/equity ratio

Interest-bearing liabilities divided by adjusted equity including minority shares.

### Equity/assets ratio

The adjusted equity at year-end divided by the total capital. Adjusted equity is defined under Return on adjusted equity below.

### Interest coverage ratio

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

### 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.

### Operating margin

Operating income in relation to operating revenues.

### Return on adjusted equity

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.

### Return on capital employed

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.

### Return on total capital

The ratio between the income for the year plus interest charges, and the total average capital.

### Self-financing level

The cashflow prior to changes in the operating capital and investments in relation to the investments for the year.

# Addresses



Network companies and balance providers are part of the working party where issues concerning balance settlement are discussed.

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Eva Grusell (page 23, 29, 31, 49, 60). Göran Eriksson (page 54). StriAB (page 55). Katrin Seuss (page 59). Christer Olsson (page 62).

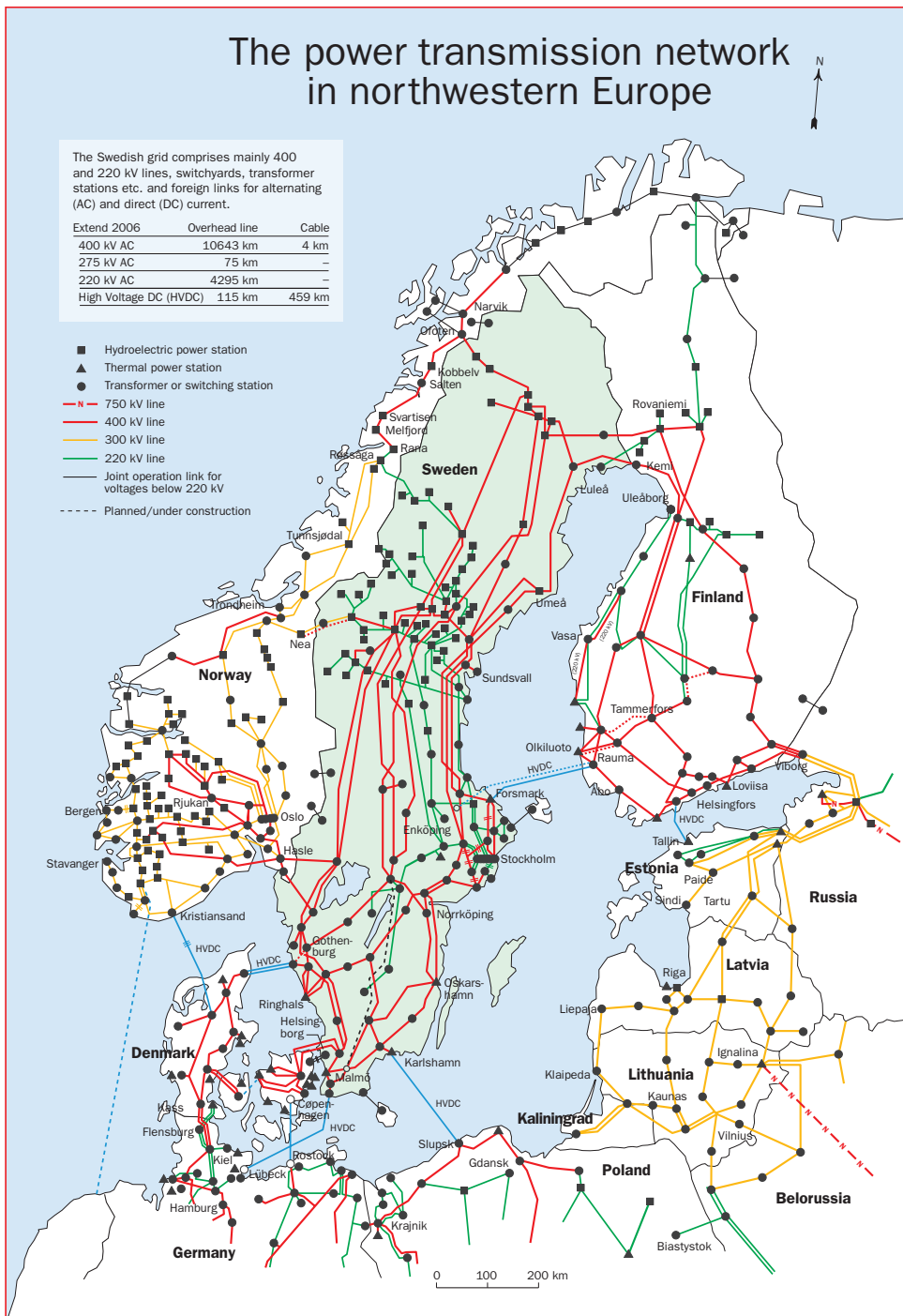
JC Schou (butterfly on front page and pages 8, 59).

# The power transmission network in northwestern Europe

The Swedish grid comprises mainly 400 and 220 kV lines, switchyards, transformer stations etc. and foreign links for alternating (AC) and direct (DC) current.

Extend 2006	Overhead line	Cable
400 kV AC	10643 km	4 km
275 kV AC	75 km	-
220 kV AC	4295 km	-
High Voltage DC (HVDC)	115 km	459 km

- Hydroelectric power station
- ▲ Thermal power station
- Transformer or switching station
- 750 kV line
- 400 kV line
- 300 kV line
- 220 kV line
- Joint operation link for voltages below 220 kV
- Planned/under construction



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