



ENVIRONMENTAL INFORMATION *2005*



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SCOPE OF THE ENVIRONMENTAL INFORMATION 2005 SUPPLEMENT

The Environmental Information 2005 supplements the environmental information provided in Pohjolan Voima's Annual Report.

The supplement deals with Pohjolan Voima's own energy production. In addition to the Group's own power plants, the parameters, e.g. fuels and emissions, include all power plant shares in so far as Pohjolan Voima obtains electricity and heat from them on the basis of its shareholding. Purchased and imported electricity is not included in the examination. The heat production volumes are shown as a whole, without taking account of the shareholdings.

The calculation limits used in this report differ from the scope of the Consolidated Financial Statements. However, these calculation limits describe the environmental burden placed by the whole of Pohjolan Voima's own energy production in the best possible manner.

Additional environmental information is available on Pohjolan Voima's and Teollisuuden Voima's Web sites at www.pohjolanvoima.fi and www.tvo.fi.

ELECTRICITY AND HEAT PRODUCTION

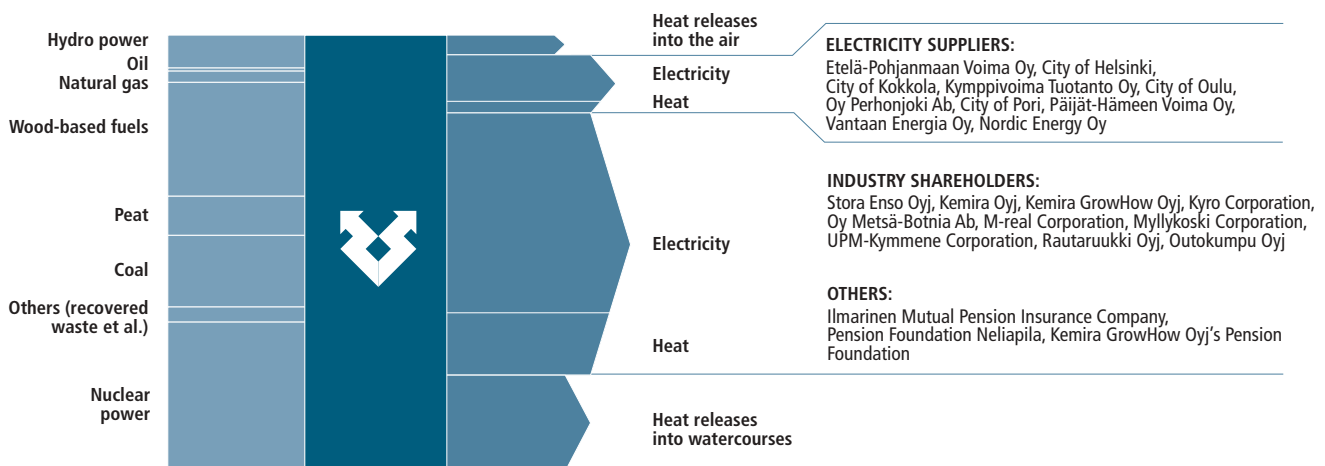
In 2005, abundant hydro power production in other Nordic countries, increase of world market prices of fuels and emissions trading reduced condensing power production in Finland.

Pohjolan Voima's total electricity supply and own production in 2005 were lower than in the previous year. Electricity generation by hydro power and thermal power remained lower than in 2004.

Pohjolan Voima's production through condensing power decreased considerably, or by about 80% while electricity generation by nuclear and wind power grew from the previous year.

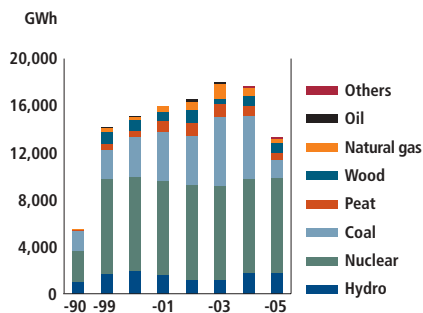
Electricity supply totalled 18.2 TWh, with Pohjolan Voima's own production accounting for 13.3 TWh. The purchases of electricity from the Nordic market reached a record high, 4.9 TWh.

ENERGY BALANCE IN 2005

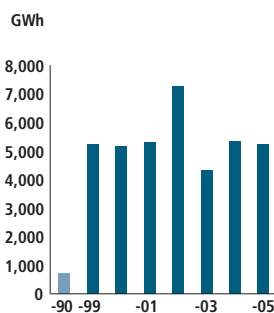


Pohjolan Voima utilizes a wide range of energy sources.

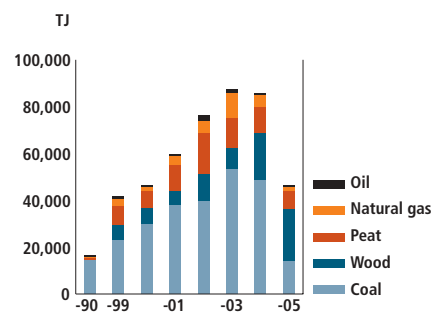
Pohjolan Voima's electricity generation



Heat production



Pohjolan Voima's fuel consumption



HYDRO POWER PLANTS AND REGULATION

	Location	Electrical output MW*)
Kaaranneskoski	Ylitornio	1.3
Jolmankoski	Pello, Ylitornio	0.3
Portimokoski	Ylitornio	5.3
Isohaara	Keminmaa, Kemi	106.0
Jumisko	Kemijärvi	30.0
	Posio, Salla	
Raasakka	Ii	58.0
Maalismaa	Yli-Ii	33.0
Kierikki	Yli-Ii	32.0
Pahkakoski	Yli-Ii	34.0
Haapakoski	Yli-Ii, Pudasjärvi	28.0
Melo	Nokia	67.0
Harjavalta	Harjavalta	14.5
Kosto (reg.)	Taivalkoski, Posio	
Irni (reg.)	Kuusamo, Taivalkoski	
Total		409 MW

WIND POWER PLANTS

	Location	Electrical output MW*)
Kokkola	Kokkola	1
Oulunsalo	Oulunsalo	2
Kristiina	Kristiinankaupunki	2
Oulu	Oulu	3
Total		8 MW

NUCLEAR POWER PLANTS

	Location	Electrical output MW*)
Olkiluoto 1	Eurajoki	477
Olkiluoto 2	Eurajoki	488
Total		966 MW

THERMAL POWER PLANTS

	Location	Electrical output MW*)
Vieskan Voima	Ylivieska	6
Kokkolan Voima	Kokkola	20
Vaskiluoto 2	Vaasa	115
Vaskiluoto 3	Vaasa	160
Seinäjäki	Seinäjäki	63
Alholma 1	Pietarsaari	12
Alholma 2	Pietarsaari	120
Kristiina 1	Kristiinankaupunki	210
Kristiina 2	Kristiinankaupunki	242
Tahkoluoto	Pori	235
Meri-Pori	Pori	146
Nokia	Nokia	70
Savonlinna	Savonlinna	0
Ristiina	Ristiina	8
Mussalo 1	Kotka	75
Mussalo 2	Kotka	238
Kymin Voima	Kuusankoski	58
Wisapower	Pietarsaari	140
Laanila	Oulu	19
Porin Prosessivoima	Pori	13
Total		1,950 MW

*) Pohjolan Voima's share

POHJOLAN VOIMA'S POWER PLANTS AND POWER PLANT SHARES ON 1 JANUARY 2006



ENVIRONMENTAL MANAGEMENT AT POHJOLAN VOIMA

Pohjolan Voima's energy generation takes place in a number of separate subsidiaries and associated companies. The Board of Directors of each subsidiary, mainly consisting of the representatives of the Group's management, takes decisions on the issues of each subsidiary and on implementation of the decisions taken by the Group's top management. This ensures that the entire Group operates in compliance with the adopted strategies.

Pohjolan Voima's production companies have adopted the certified environmental management systems according to the ISO 14001 standard. Furthermore, Teollisuuden Voima has been accepted into the EMAS register. The environmental programmes included in the systems ensure continuous improvement of the operations.

All power plants in Pohjolan Voima have valid environmental and Water Court permits. No deviations from regulatory compliance were identified in 2005.

In early 2005, some turbine lubrication oil leaked from the Mussalo power plant into the cooling water channel and dock basin. The accident was caused by damage in the oil cooler. In accordance with a plan made with the authorities, future damage will be prevented by more frequent checks of the heat exchangers and by fixed oil containment booms.

In October, a leak was discovered in the sealing wall at the bottom of the Melo power plant dam in the River Kokemäenjoki. However, there was no danger of the dam collapsing or risk to outsiders at any point. The dam repairs started immediately.

Pohjolan Voima has published an Environmental Report since 1994. From 2001, the most significant environmental information has been published as part of the Annual Report and at the company Internet site, which also includes data on the origin of and emissions from electricity production required by law.

ENVIRONMENTAL ISSUES AT POHJOLAN VOIMA

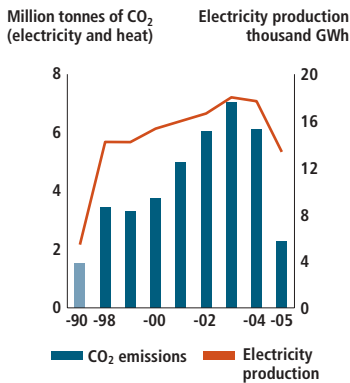
The versatile range of energy production forms means that the environmental effects are distributed accordingly. The environmental effects of thermal power production primarily concern the atmosphere. The greatest effect of nuclear power results from the heat released into the sea. Hydro power plants alter the watercourses and their fish stocks, while wind power plants affect the landscape.

Pohjolan Voima controls its environmental effects as a whole. In accordance with the life-cycle approach

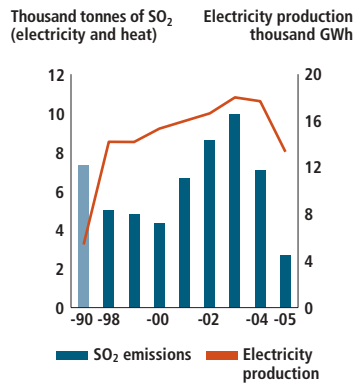
adopted, the starting point is to identify and reduce the environmental effects and risks of our operation, and to ensure the overall efficiency of operations.

The emissions from thermal power production are subject to international agreements, which provided a basis for national legislation. Emissions from power plants are restricted and their effects are reduced by plant-specific permits, and they are monitored in accordance with the plans validated by the authorities.

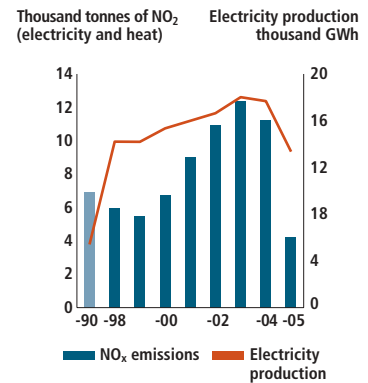
Pohjolan Voima's carbon dioxide emissions



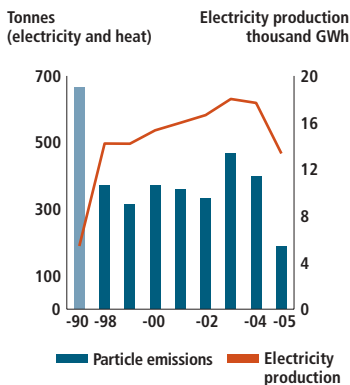
Pohjolan Voima's sulfur dioxide emissions



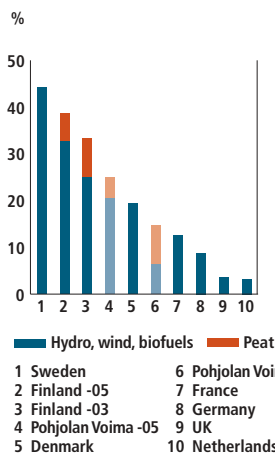
Pohjolan Voima's nitrogen oxide emissions



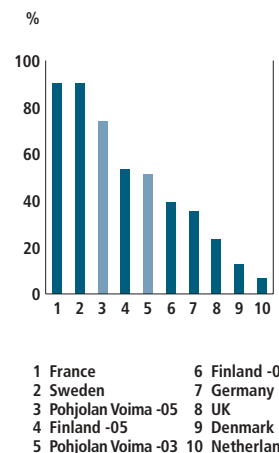
Pohjolan Voima's particle emissions



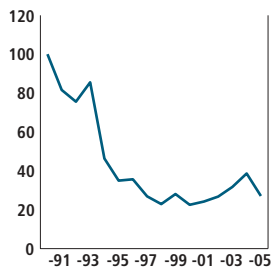
Electricity generation structure 2003 renewables and peat



Electricity generation structure 2003 emission-free (hydro, nuclear, wind)

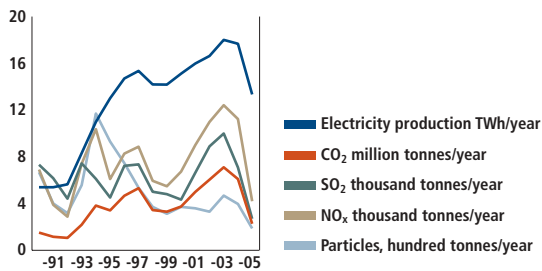


Environmental index of thermal power, 1990–2005



The environmental index of thermal power includes the specific emissions of carbon dioxide, sulphur dioxide, nitrogen oxides and particles, and the volume of by-products stored in disposal areas. All factors carry the same weight.

Pohjolan Voima's production and emissions, 1990–2005



The emissions from outside Finnish borders place the greatest burden on Finnish soil. Power plants account for a small portion of the particles and other impurities present in urban air, of the order of a few per cent at most.

The EU Emissions Trading Scheme (EU ETS) was launched in 2005. Pohjolan Voima's thermal power

plants obtained their emissions permits and allowances in the first months of 2005. The prerequisite for greenhouse gas emissions permits is the monitoring and reporting of CO₂ emissions. In addition, the number of allowances corresponding to the previous year's CO₂ emissions is to be surrendered to the authorities. Carbon dioxide emissions are curbed e.g. by increasing emission-free forms of production and by increasing energy efficiency. Sulphur emissions are controlled by the choice of fuel and desulphurization technology. The emissions of nitrogen oxides are mainly reduced by combustion technology. Particle emissions are cut by means of electrostatic precipitators.

Thermal power production with consequent emissions decreased considerably from 2004. In 2005, the carbon dioxide emissions amounted to 2.3 million tonnes and the particle emissions to 187 tonnes. 148 thousand tonnes of fly ash, bottom ash and desulphurization gypsum were produced as by-products from the flue gas cleaning. 62% of these were reutilised in earthwork or by the construction industry.

Hydro power production has regional and local effects on the watercourses and fish stocks. Pohjolan Voima has been carrying out systematic management and restoration measures of the aquatic environments since the 1980's, mostly voluntarily and jointly with the Regional Environment Centres, municipalities, fishery associations and other stakeholders. The environmental costs of hydro power production amounted to EUR 2.6 million in 2005. These costs mainly consisted of

COMPENSATION FOR THE DAMAGE AND HARM CAUSED BY THE CONSTRUCTION OF HYDRO POWER UP TO THE END OF 2005

Clearing and landscaping of shores*	988 km
Protection against erosion of shores	2,025 estates, 279 km
Deepening and shaping of shores	27 locations
Boat ramps	116 pcs
Boat harbours*	402 estates
Drainage ditches*	117 km
Tap water*	450 households
Roads*	794 estates
Landscaping weirs*	42 pcs
Beaches	38 pcs
Clearing of fishing grounds	470 pcs
Fish migration barriers*	6 pcs
Fish stocking (required by the authorities)	3.8 million individuals/year
Fishways	3 pcs

* Some of them joint projects
(PVO-Vesivoima Oy/municipalities/authorities/local fishery associations)

environmental management work and management of the fish stocks. Most of the fish is stocked in the mouths of rivers to compensate for preventing migratory fish from naturally spawning. Fish stocking in inland waters is also extensive.

Teollisuuden Voima Oy, which produces nuclear power, has operated in accordance with the environmental permits and the environmental management system. No significant deviations from regulatory compliance were identified in the company in 2005. All operations related to the construction phase of the OL3 plant unit are covered by a certified environmental management system.

The heat load carried with cooling waters into the sea totalled 27.7 TWh. The cooling water changes the ice conditions because the place of discharge

remains open. The size of the open area varies between 3 to 20 square kilometres, depending on the winter. Monitoring has shown that operation of the power plant has no major harmful effects on the fish stock and fishing in the surrounding sea area.

Releases from the Olkiluoto nuclear power plant into the air were extremely small. Radioactive releases into the sea are caused by fission and activation products. Their releases into the sea amounted to 0.23% of the release limits set by the authorities. Tritium releases into the sea were 1.95 TBq, 10.7% of the official limit.

The radiation situation in the environment has been normal. During the reported year, the individual radiation dose caused to the population within reach of the plant was 0.0002 mSv, while the average annual dose received by the Finns is 3.7 mSv.

The average occupational radiation doses received by the personnel working at the Olkiluoto power plant were 1.54 mSv. The highest single personal dose was 11.9 mSv, less than quarter of the maximum value of 50 mSv in a single year set by the authorities. The combined radiation dose received by staff working at Olkiluoto was 2.286 manSv.

The company paid EUR 15.71 million to the State Nuclear Waste Management Fund.

Pohjolan Voima's shareholding in Teollisuuden Voima is 57.2%.

Pohjolan Voima generates wind power at nine power plants with the output of 1 MW and at one plant with 3 MW output.

POWER PLANT-SPECIFIC INFORMATION

The information on emissions and by-products given below includes the combined amounts of all units by power plant. On the basis of its participation, Pohjolan Voima also obtains electricity from the Meri-Pori power plant located at Tahkoluoto in Pori, owned by Fortum Power and Heat Oy. Emissions from the Meri-Pori plant, however, are not included in the emission figures of the Tahkoluoto plant.

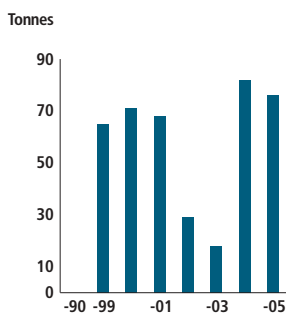
Information on specific emissions is given by power plant unit with regard to the principal emissions sources. In most cases, the emission regulations issued

for the power plants concern specific emissions, which have been defined per volume of energy fed into the boiler (mg/MJ). Annual quotas have been issued for some plants. Emissions and their effects are monitored and the data is reported to the authorities in accordance with the regulations imposed by the permits.

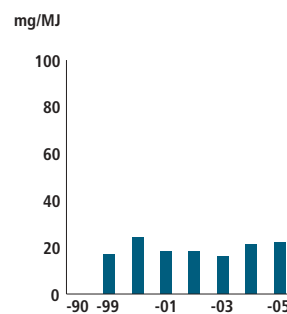
The amounts of ash shown in the graphs concerning the use and final disposal of ash do not correspond to the accumulation of ash, since some of the ash may have been taken to interim stores.

POHJOLAN VOIMA'S PLANT-SPECIFIC DATA • NOKIA

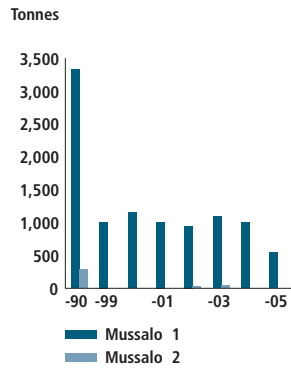
Nitrogen oxide emissions



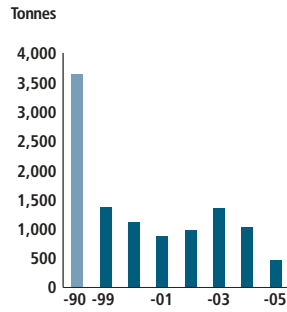
Specific emissions of nitrogen oxides



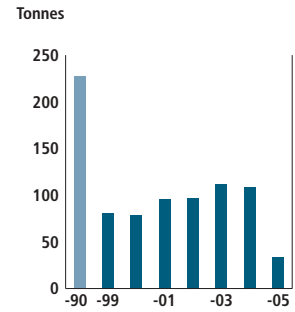
Sulphur dioxide emissions



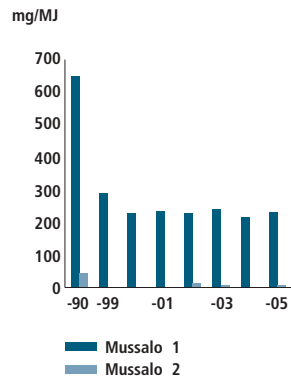
Nitrogen oxide emissions



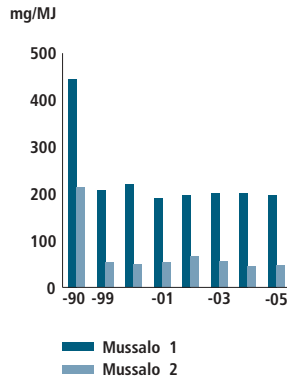
Particle emissions



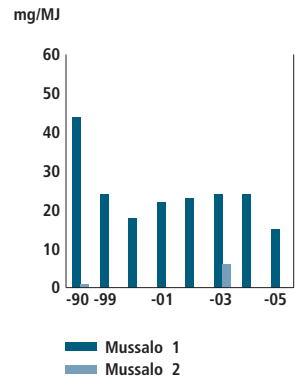
Specific emissions of sulphur dioxide



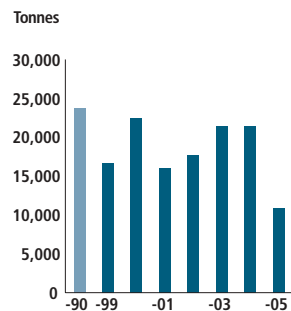
Specific emissions of nitrogen oxides



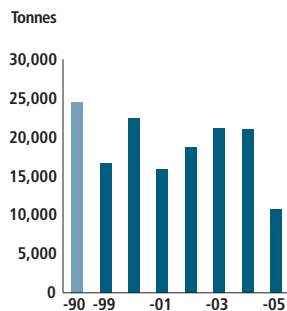
Specific emissions of particles



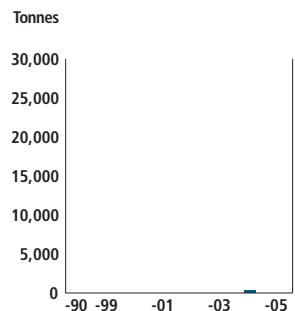
Accumulation of ash



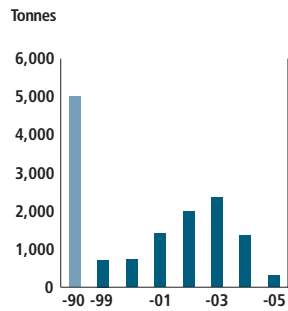
Use of fly ash



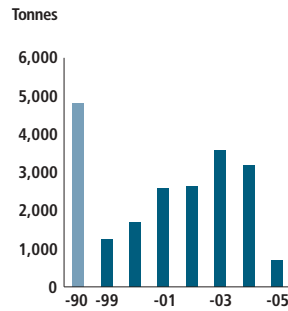
Disposal of ash



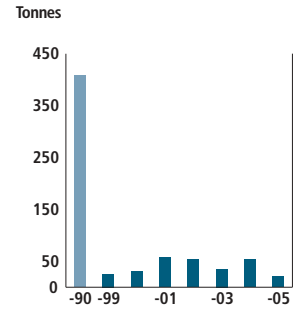
Sulphur dioxide emissions



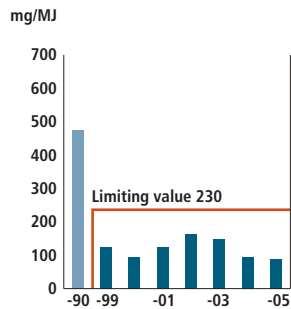
Nitrogen oxide emissions



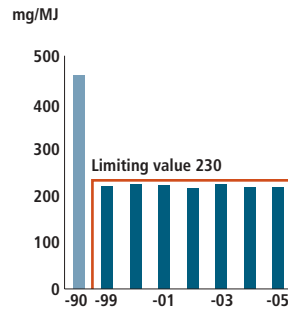
Particle emissions



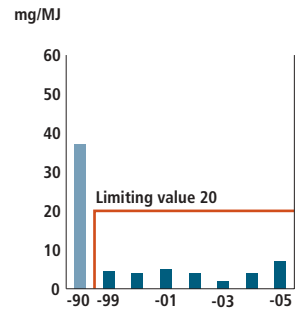
Specific emissions of sulphur dioxide



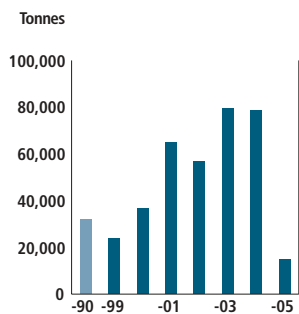
Specific emissions of nitrogen oxides



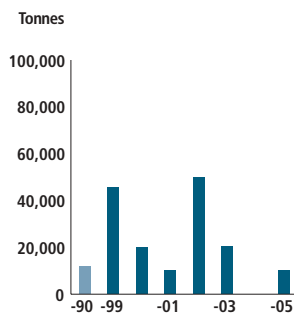
Specific emissions of particles



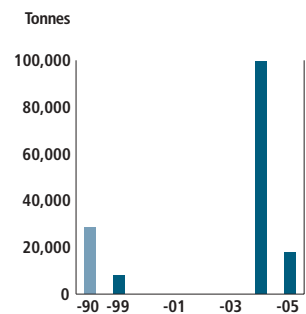
Accumulation of ash



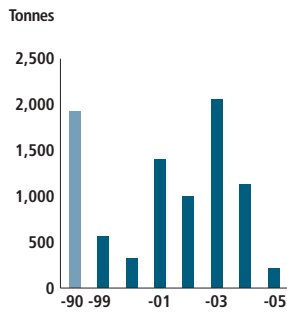
Use of fly ash



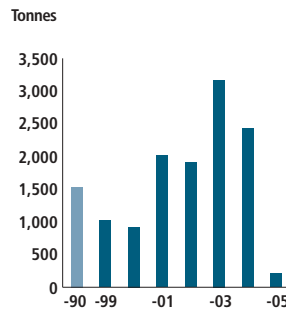
Disposal of ash



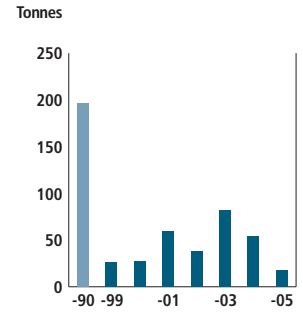
Sulphur dioxide emissions



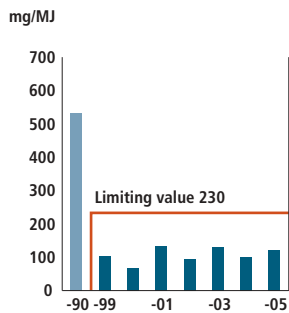
Nitrogen oxide emissions



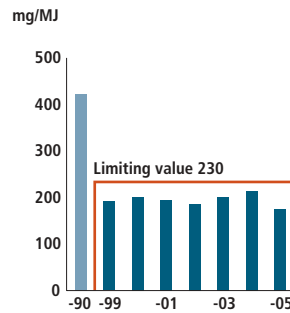
Particle emissions



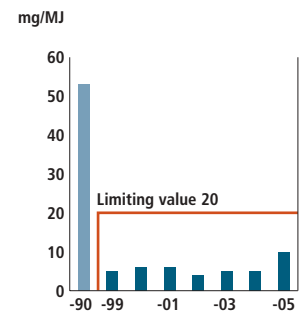
Specific emissions of sulphur dioxide



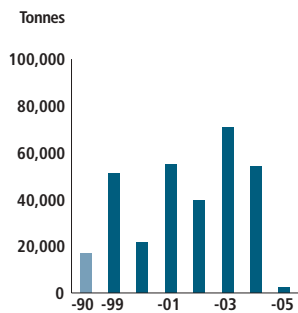
Specific emissions of nitrogen oxides



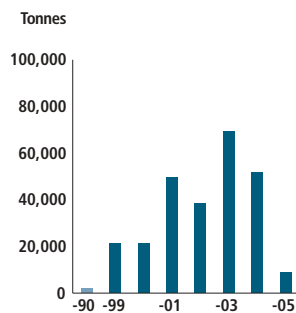
Specific emissions of particles



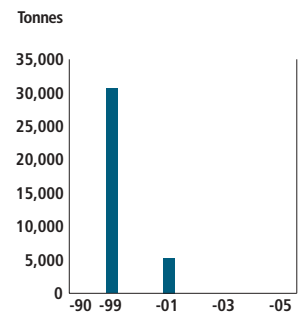
Accumulation of ash



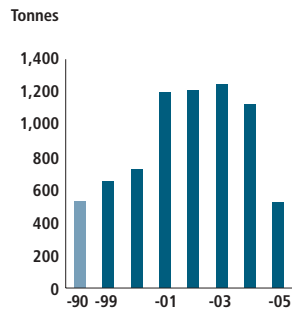
Use of fly ash



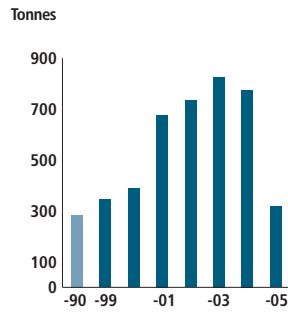
Disposal of ash



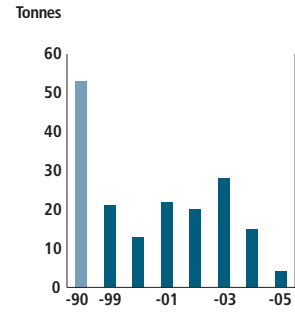
Sulphur dioxide emissions



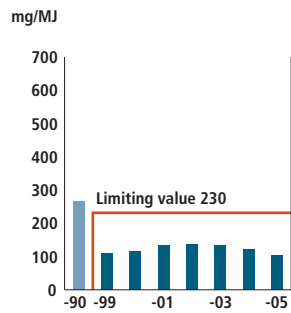
Nitrogen oxide emissions



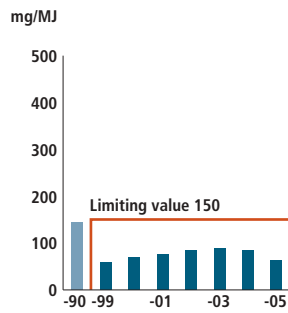
Particle emissions



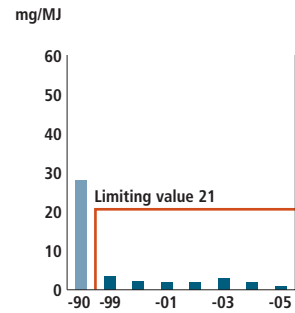
Specific emissions of sulphur dioxide



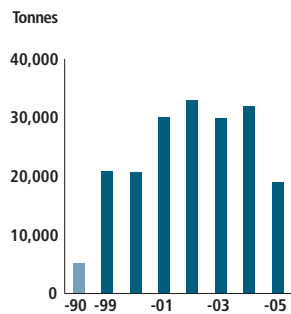
Specific emissions of nitrogen oxides



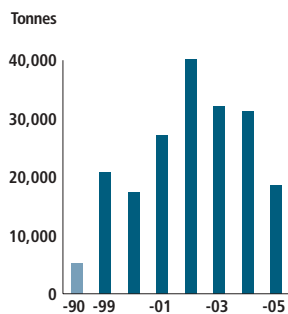
Specific emissions of particles



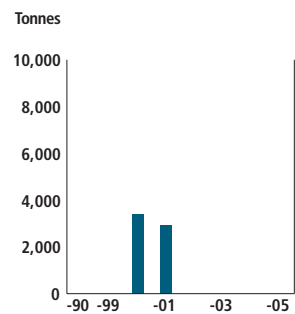
Accumulation of ash



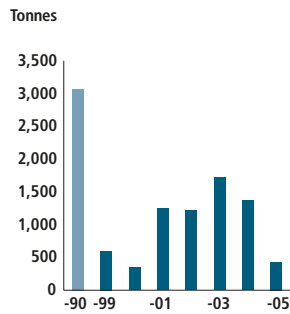
Use of fly ash



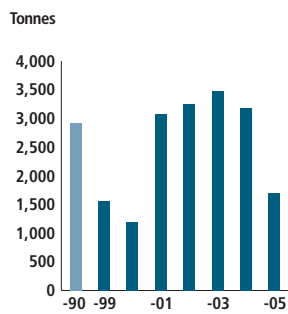
Disposal of ash



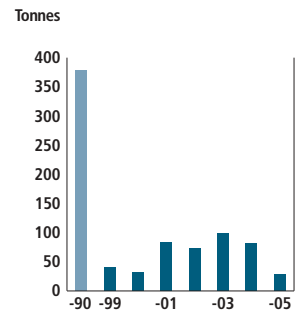
Sulphur dioxide emissions



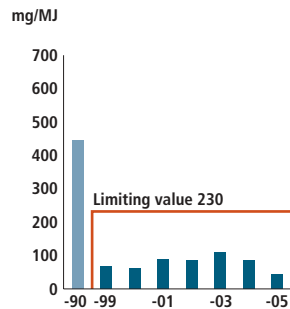
Nitrogen oxide emissions



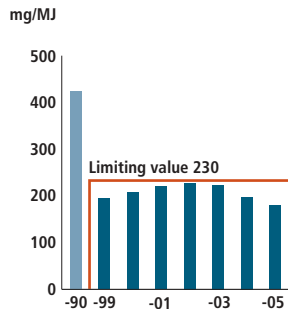
Particle emissions



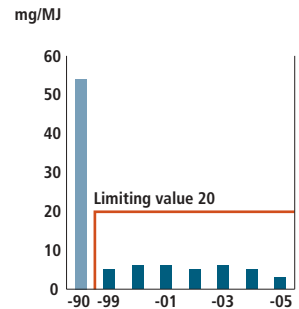
Specific emissions of sulphur dioxide



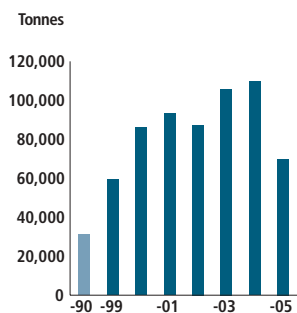
Specific emissions of nitrogen oxides



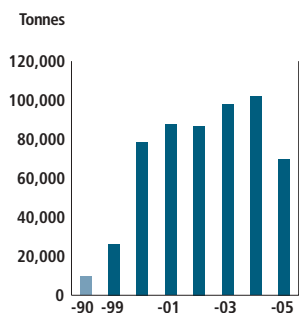
Specific emissions of particles



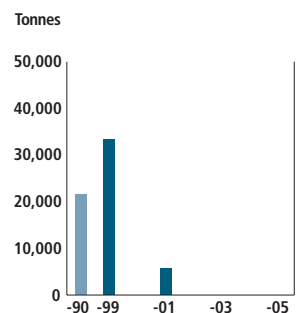
Accumulation of ash



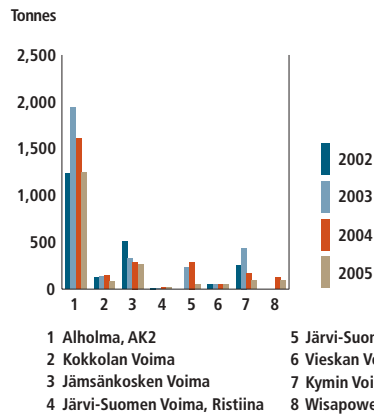
Use of fly ash



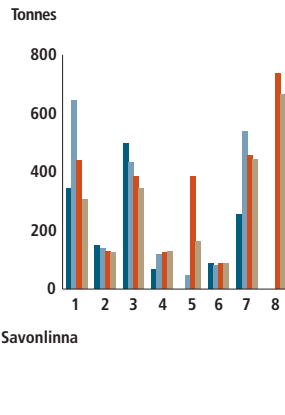
Disposal of ash



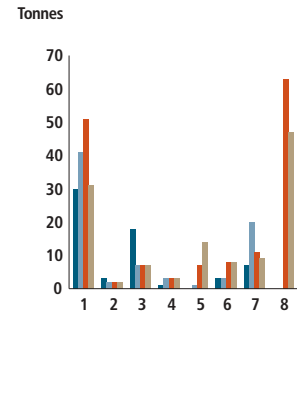
Sulphur dioxide emissions



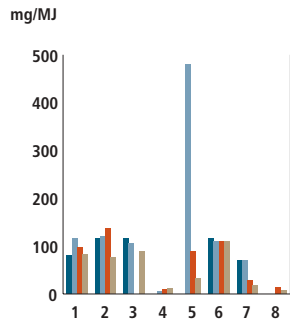
Nitrogen oxide emissions



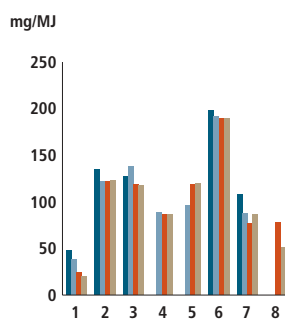
Particle emissions



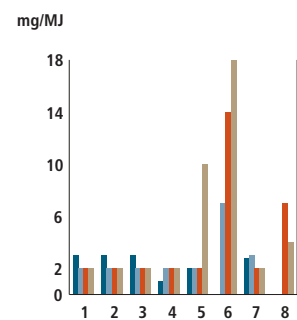
Specific emissions of sulphur dioxide



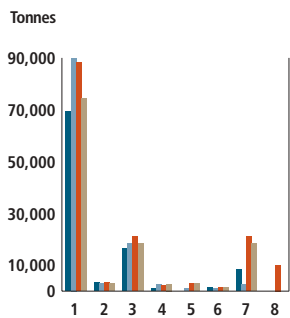
Specific emissions of nitrogen oxides



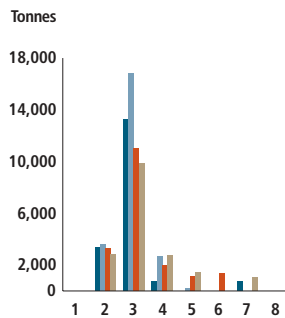
Specific emissions of particles



Accumulation of ash



Use of fly ash



Disposal of ash

