



Pohjolan Voima year 2010

Review by the President

The year 2010 was a historic one in terms of energy policy. On July 1st, the Finnish Parliament ratified the two new favourable decisions-in-principle on nuclear power. In addition, a decision was made on a package that included significant investment in renewable energy. For Pohjolan Voima, this was a welcome decision.

Pohjolan Voima had an eventful and successful year in 2010. Cold weather, the recovery in industrial production and the completion of new power plants by Kaukaan Voima and in Kerava increased our electricity production volume by 14 per cent.

Investments will increase our carbon-free production

Our energy production will continue to increase in the future. In particular, we are going to invest in nuclear power and, hopefully, in the future also in hydropower. Thanks to the improvements made during the annual maintenance of the Olkiluoto 1 unit, the efficiency of the turbine island was improved, and the unit's electricity generation capacity increased by 20 MW, and a similar improvement will take place in the Olkiluoto 2 unit in 2011. The regular electricity production of about 1,600 MW in the Olkiluoto 3 unit will, according to the plant supplier's estimate, begin in the latter half of 2013. The Olkiluoto 4 project is now backed by a political decision, and the preparation of the investment continues.

Our bioenergy programme continues in Hämeenkyrö, where a new power plant will be completed in 2012. This is Pohjolan Voima's fifteenth investment in a bioenergy plant. The environmental impact assessments of wind power projects were completed and the planning of the projects was continued.

Once the investments under construction are completed, the share of carbon-free electricity production by Pohjolan Voima will increase from the approximately 65 per cent in 2010 to about 90 per cent.

Changes in taxation and emission trade systems encourage Pohjolan Voima, as well as the energy sector as a whole, to take steps towards carbon-neutral production. We hope that this consistent energy policy will continue and that there will be no further obligations imposed on carbon-free energy production.

A significant increase in hydropower requires political will

The current Government's energy policy promise to make a large-scale increase in hydropower was not kept. The construction of hydropower does not require state subsidies, but it does require political will. A quick way to make a significant increase in hydropower production in Finland is to store the flood waters of the Iijoki River in the Kollaja reservoir. This reservoir can then be put to use when demand is at its highest or wind power production remains smaller than predicted.

Pohjolan Voima appointed a new President and CEO at the beginning of July 2010. Mr Timo Rajala, who had held the post for 18 years, retired. During his time as President and CEO he made Pohjolan Voima a major player in the Finnish energy sector.

Our primary task is to produce energy at cost on a large scale for our owners reliably, cost-effectively and in an environmentally friendly manner. In 2010, we were very successful in fulfilling this task, for which I want to warmly thank our employees, shareholders and other partners.

Lauri Virkkunen
President and CEO
Pohjolan Voima Oy

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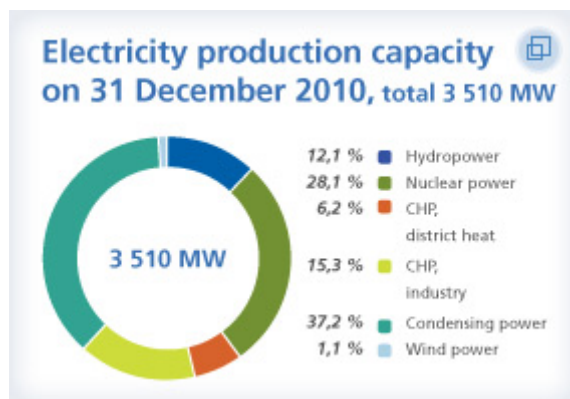
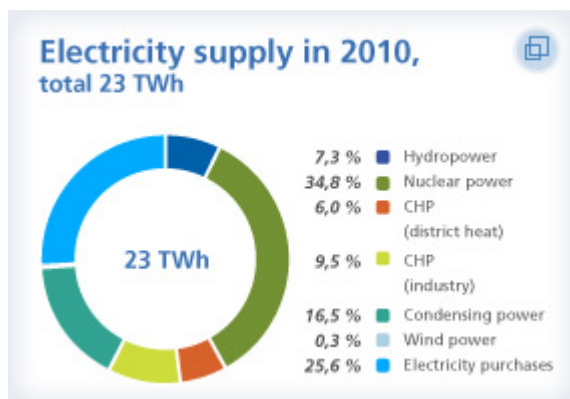
Production in 2010

In 2010, Pohjolan Voima's total electricity supply was 23.0 TWh, of which **17.1 TWh** was produced by Pohjolan Voima's own production capacities. Compared to previous year, Pohjolan Voima increased its own production by 14 per cent.

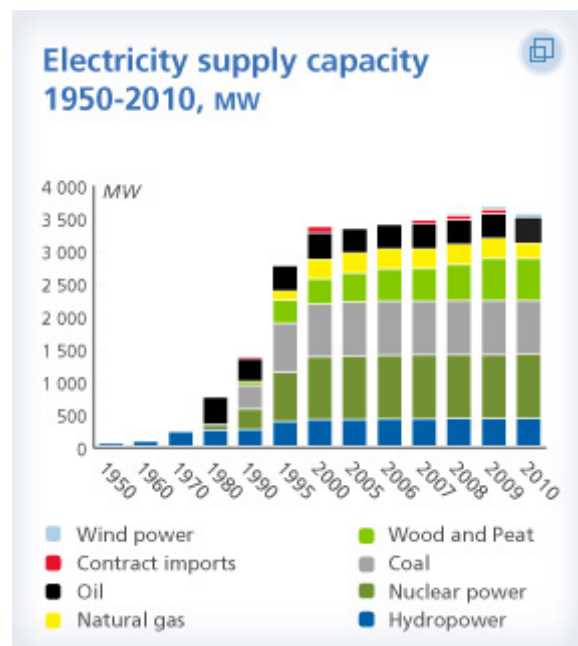
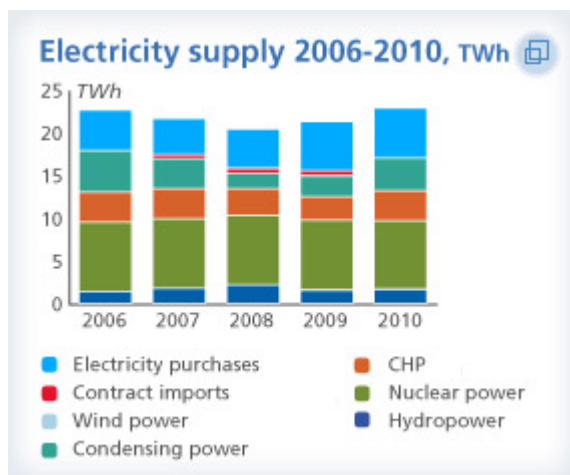
The volume of electricity produced by nuclear power decreased somewhat from the previous year's levels due to the extensive annual maintenance at the Olkiluoto 1 unit. The volume of electricity produced by hydropower was on the increase compared to previous year. The production of condensing power plants continued to increase and hit a record level. The volume of electricity produced at combined heat and power production plants also increased on the previous year, thanks to the cold weather, the recovery in industrial production and the introduction of new capacity. Wind power production remained at the previous year's level. The production of district heat and process steam reached 6.3 TWh.

At the end of 2010, Pohjolan Voima's electricity production capacity totalled 3,510 MW.

The consumption of electricity in Finland rose sharply in 2009 after the recession. In 2010, the total electricity consumption in Finland was 87.5 TWh, a 7.6 per cent increase on the previous year. Poor water conditions throughout the year, lengthy annual maintenance outages at Swedish nuclear power plants and weather that was colder than usual increased the use of condensing power capacity, which was up by 50 per cent from the previous year. In addition to cold weather, the recovery in industrial electricity consumption made the level of electricity production in combined heat and power production plants reach a new record.



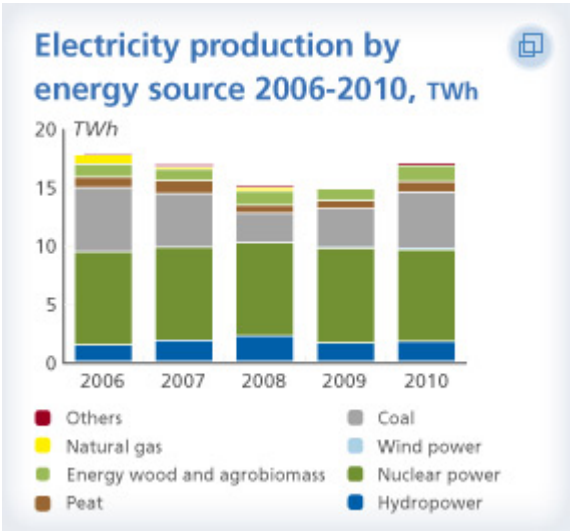
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[Pohjolan Voima's power plants »](#)

[Pohjolan Voima's production capacity split by power plant on 31 December 2010](#)

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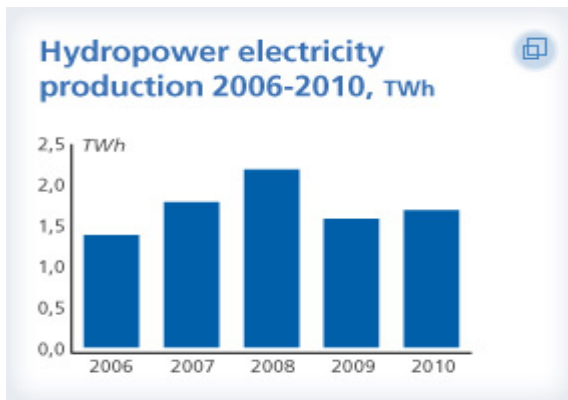


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Hydropower

Pohjolan Voima has a total of 12 hydropower plants on the rivers Iijoki, Kemijoki, Kokemäenjoki and Tengeliönjoki. The combined electricity generation capacity of the plants is 488 MW, of which Pohjolan Voima's share is 423 MW.

Hydropower production at a normal annual level



In 2010, a total of 1.7 TWh of electricity was produced using hydropower, which was slightly more than on the previous year. The production volume corresponded to that of an average water year. Thanks to the increase in the capacities of Maalismaa and Kaaranneskoski power plants, the total hydropower capacity increased somewhat.

- [Read more on last year's environmental issues in hydropower production](#)
- [Read more on investments in hydropower](#)

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Nuclear power

Teollisuuden Voima Oyj (TVO), a joint venture of Pohjolan Voima, has a nuclear power plant located in Olkiluoto, Eurajoki. The power plant comprises two plant units with a combined electricity capacity of 1,740 MW.

The most extensive annual maintenance to date at Olkiluoto 1

In 2010, the total electricity production by Olkiluoto nuclear power plant was 14.1 TWh. Pohjolan Voima's share of the production amounted to 8.0 TWh. The average capacity factor of the plant units remained high and was 93.8 per cent. Overall, the production year was a satisfactory one.

The OL1 unit had its largest annual maintenance yet, after which the nominal net electricity production capacity was stepped up by 20 MW. The maintenance outage lasted for 26 days. The capacity factor of the OL1 plant unit was 91.8 per cent, while the capacity factor of the OL2 plant unit was 95.2 per cent.

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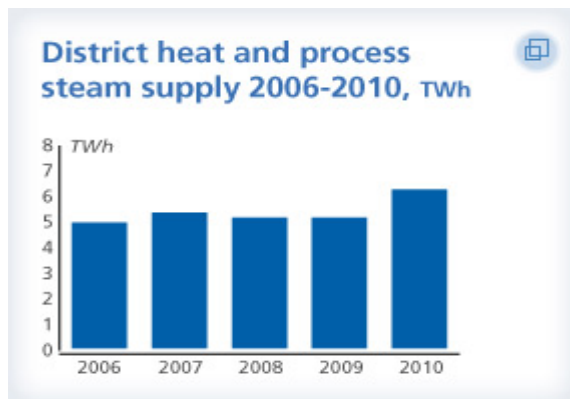
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Thermal power

Pohjolan Voima's total electricity generation capacity in thermal power production is 2,061 MW. In addition to electricity, combined heat and power production plants produce district heat and process steam for consumption by local industry and communities.

Thermal power production was up

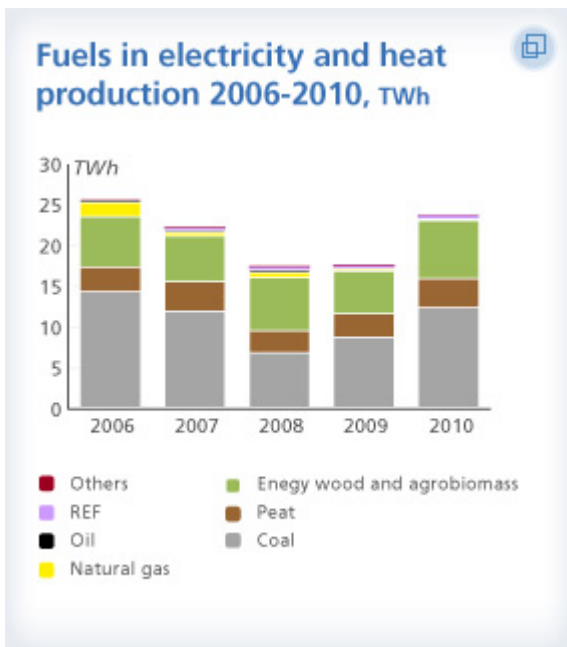
The total electricity generation in thermal power plants was 7.4 TWh, exceeding the 2009 figure by 40 per cent. Combined heat and power production plants generated 3.5 TWh of electricity. This is almost one third more than in the previous year. The reasons for this were the cold weather, the recovery in industrial production and the production capacity that increased with the inauguration of the power plants by Kaukaan Voima and in Kerava.



Pohjolan Voima's heat production hit a new record. Total heat production in 2010 was 6.3 TWh, which is 24 per cent more than in 2009.

The total volume of electricity produced in condensing power plants increased to 3.8 TWh in 2010. The volume was up by almost 60 per cent compared to the previous year. The condensing power production increased due to prolonged annual maintenance at Swedish power plants and poor water conditions in the Nordic countries.

The entire capital stock of Vieskan Voima Oy was sold, and the Ylivieska power plant was transferred to Perhonjoki Oy in October. The Nokia thermal power plant was sold to Fortum Power and Heat Oy early in 2010.



The fuel consumption at thermal power plants was also on the increase compared to the previous year. In 2010, thermal power plants consumed:

- 12.2 TWh of coal
- 7.1 TWh of biofuels
- 3.8 TWh of peat
- 0.4 TWh of refuse-derived fuels (REF) and
- 0.2 TWh of oil.

Reserve power plants

Oil-fired condensing power plants in Kristiinankaupunki and Vaasa and the Mussalo gas-fired condensing power plant in Kotka will continue to belong to the national power reserve system coordinated by Fingrid until 28 February 2011. The combined capacity of the three plants is 600 MW. On 8 January 2010, the power reserve was activated for a few peak hours.

- **[Read more on last year's environmental issues in thermal power production](#)**
- **[Read more on investments in bioenergy.](#)**

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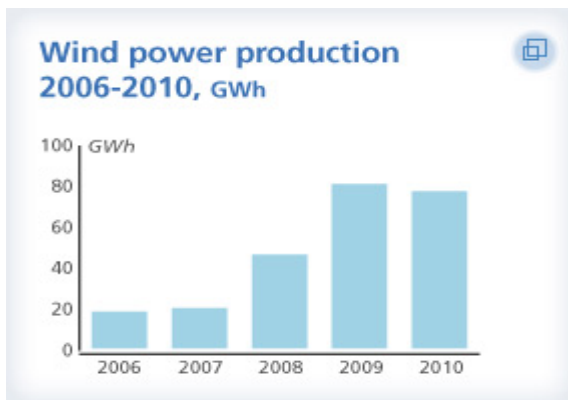


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Wind power

The wind power plants of Pohjolan Voima's subsidiary PVO-Innopower are located in Kokkola, Kristiinankaupunki, Oulu, Oulunsalo and Ajos, Kemi. In addition, TVO has a 1-MW wind power plant at the Olkiluoto nuclear power plant site in Eurajoki. The combined electricity generation capacity of the wind power plants is 50 MW, of which Pohjolan Voima's share is 38 MW.

Wind power production at previous year's level



In 2010, Pohjolan Voima produced 0.1 TWh of wind electricity. The volume was slightly smaller than in the previous year due to operability issues.

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Electricity purchases

Electricity purchased from the electricity market

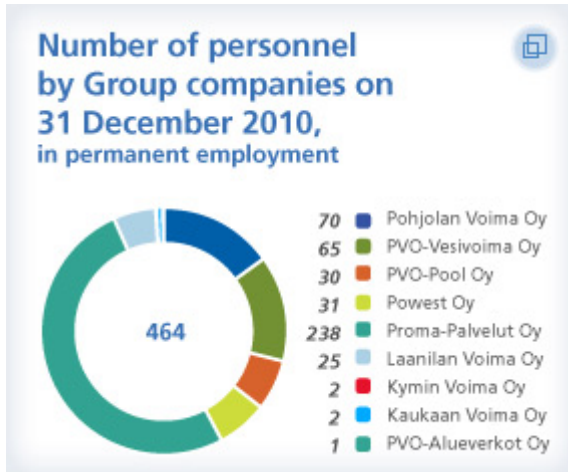
In 2010, Pohjolan Voima purchased a total of 5.9 TWh of electricity from the Nordic market. The volume was somewhat greater than in the previous year. An electricity purchase agreement with Estonia was terminated at the end of 2009.

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Personnel



There is strong expertise and competence with respect to energy production in Pohjolan Voima. Pohjolan Voima is considered to be a good employer and a reliable and responsible organisation.

[Read more on Pohjolan Voima's HR issues »](#)

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Personnel are prepared to make a change

In 2010, our personnel's opinions were studied through a personnel survey and web-based interviews. In addition, supervisors were interviewed on the subject of importance and current state of managerial work and leadership. The results of all these studies point in the same direction.

All in all, Pohjolan Voima is a good employer

Our personnel have a high opinion of Pohjolan Voima as an employer. According to the Personnel Survey 2010, the index measuring the personnel's commitment to the company was 73, whereas in Personnel Survey 2008 it was 65. The comparison figure for Finland is 59.

Of the personnel...

82 % think that Pohjolan Voima is a good employer

78 % would recommend Pohjolan Voima as a place to work

82 % believe that they have enough opportunities to contribute to the planning of their tasks and their work in general

88 % believe that Pohjolan Voima has taken adequate care of health and safety at work

Reform is welcome

The themes in the web-based interviews were Pohjolan Voima's capability for reform and the associated challenges, and answers emphasised the personnel's trust and appreciation of the company, the will to improve leadership and communication culture, and a strong inclination towards reform. The results of a survey conducted among supervisors showed that supervisors want Pohjolan Voima to be geared towards development. Supervisors are committed to Pohjolan Voima's objectives, and in their answers, they highlighted the need for a regular monitoring of the targets.

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Personnel development

Pohjolan Voima is willing to develop its working environment to become as motivating as possible. The aims are to ensure that adequate competence is retained and to support the personnel in changes. An HR executive group and a training committee back up the management in personnel development issues.

Training boosts the personnel's development

The first group-wide supervisor training day took place in January 2010. The topics discussed during the session concentrated on the supervisors' role in strategy implementation. In the autumn, the fifth Pohjolan Voima Management Training took place. PVO-Pool Oy, where interaction coaching was started in 2010, was already the third Group company to take part in this type of training. A number of employee training sessions on occupational safety responsibility issues were also held. Furthermore, internal training sessions were conducted, concentrating on development themes suggested by the personnel.

On average, there were slightly fewer than two training days per person.

Active preparation in anticipation of retirement

The purpose of long-term resource planning is to ensure a smooth operation of core processes and a sound management of defined strategic competencies. In 2010, a process called successor planning was started in the parent company. With successor planning, the Group wants to make sure that the key competencies of people who will retire within the next five years will be retained in the Group.

Lessons learned from the Wellbeing 2010 programme now under consideration

Pohjolan Voima Oy's Wellbeing 2010 programme included introductions to new sports and exercises, briefings on well-being issues and a personal exercise tracker for everyone. The programme's follow-up and an assessment of the results will take place early in 2011. On the basis of lessons learned, it will be decided whether the programme is going to be extended to other Group companies.

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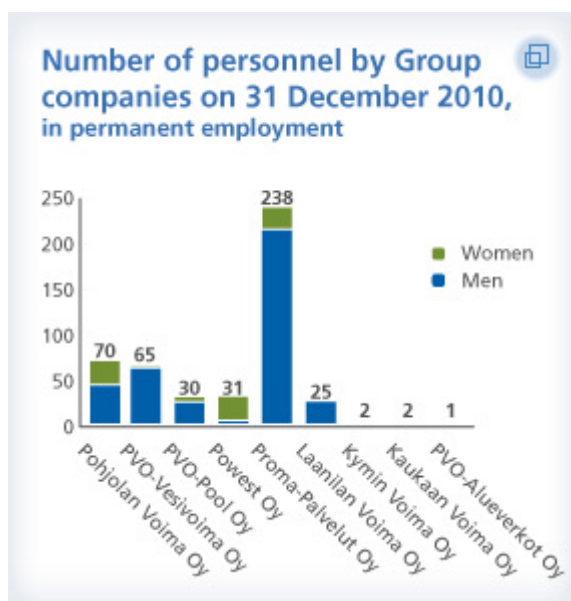
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Facts and figures on the personnel

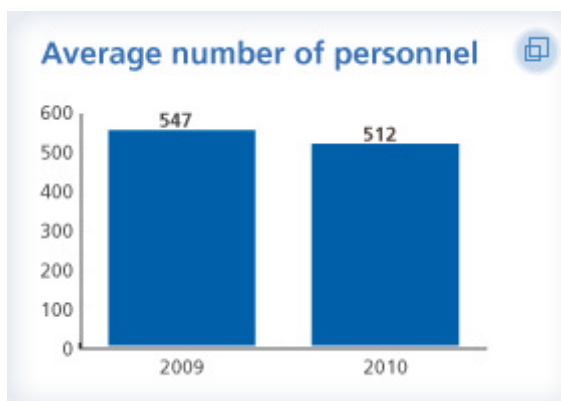
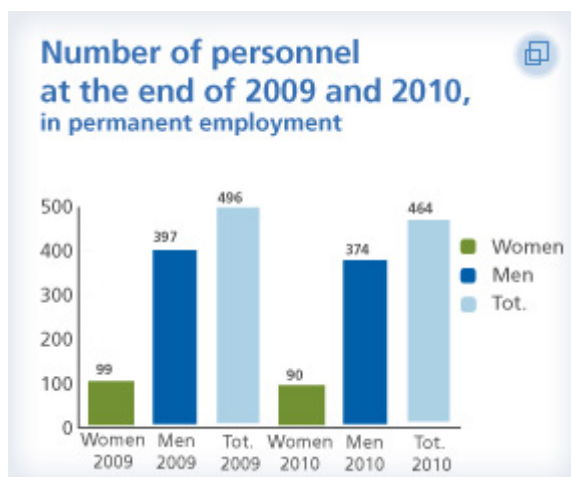
On 1 July 2010, Lauri Virkkunen, M.Sc. (Eng.), M.Sc. (Econ.) was appointed the President and CEO of Pohjolan Voima Oy after the retirement of the Group's long-term President and CEO Timo Rajala. Executive Vice President Pertti Simola retired on 1 May 2010.

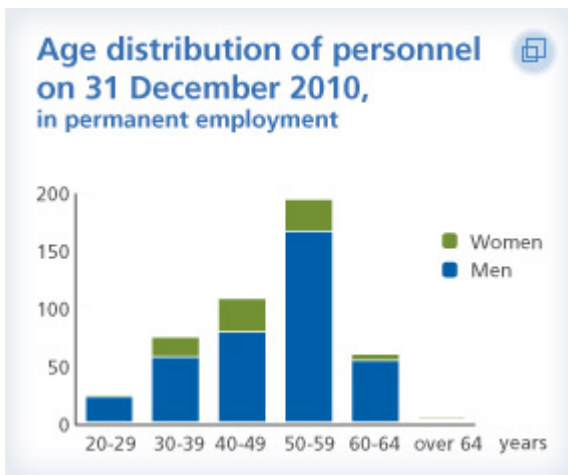
Pertti Pietinen, M.Sc. (Eng.) started as the President of PVO-Vesivoima Oy on 1 July 2010. The former President Birger Ylisaukko-oja retired.

Key personnel figures in 2010



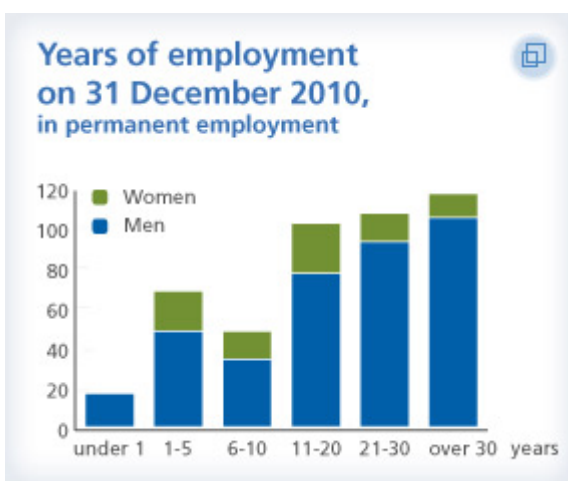
At the end of 2010, the number of personnel in the company was **481**. Of those, 17 people or 3.5 per cent had fixed-term contracts. There was a slight decrease in the number of personnel on the previous year: at the end of 2009, the number of personnel in the company was 510, and 14 people or 2.7 per cent had fixed-term contracts. The share of women in permanent employment decreased somewhat in comparison to 2009. The share in 2010 was 19.4 per cent, while in 2009 it was 20.0 per cent.





The most common working time arrangement is full-time work. The share of part-time workers was 7.1 per cent. Part-time work is usually chosen by the employees on their own initiative, and it is often related to parental leave or partial retirement. The total number of summer employees on fixed-term contracts in 2010 was 86.

The average age of personnel in permanent employment decreased slightly and was 48.8 years, while in 2009 it was 49.1 years. The share of those past 50 was 256 people, or 55.2 per cent.



A total of 26 employees were granted old-age pension. The number of permanent employment contracts terminated for other reasons was 33. This number includes the 14 employees transferred from Proma-Palvelut to Maintpartner Oy when the business operations of Nokia power plant were sold to Fortum Power and Heat early in 2010.

The number of new permanent contracts was 18. Personnel turnover in 2010 was 8.3 per cent, while in 2009 it was 5.1 per cent.

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Co-operation activities

Co-operation through Group Meetings

Group co-operation activities in 2010 resulted in two Group Meetings, where the management informed personnel representatives of the operating environment of the energy sector, Pohjolan Voima's situation with respect to production, projects and economy, procedure directions concerning the personnel as well as personnel development activities. Matters related to company-level co-operation activities are the responsibility of individual Group companies.

Viability of salary arrangements under consideration

Pohjolan Voima's personnel are included in the collective labour agreements of the energy sector. In early 2010, all personnel groups started a new collective labour agreement period, which will come to an end in 2013. Agreements concerned salaries during the first year of the agreement, and the next salary negotiations will take place in the spring 2011.

The viability of salary arrangements that follow the collective labour agreements, as well as their uniform application in Proma-Palvelut, were taken under consideration in 2010. In 2011, salary arrangements will be studied in other Group companies as well.

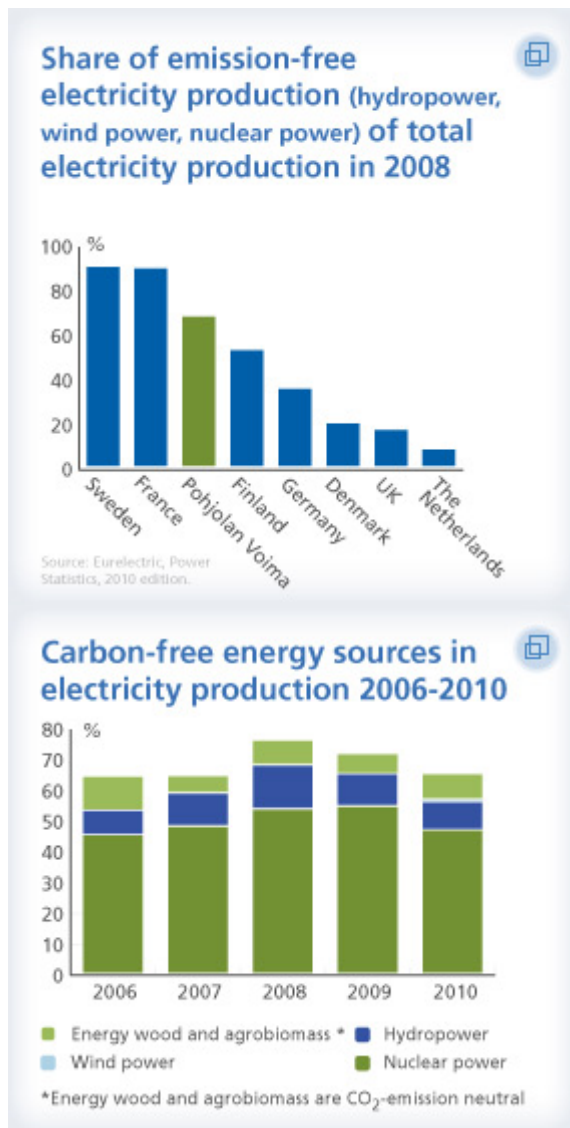
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Environmental Issues

A basic requirement for persistent and long-term energy production is maintaining a safe, healthy and diverse environment. With their certified environmental management systems according to the ISO 14001 standard, Pohjolan Voima's production companies make sure that environmental objectives are achieved.



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Hydropower and the environment

Success in meeting hydropower production's fishery obligations

Did you know?

Did you know that besides following the obligations imposed by the authorities, Pohjolan Voima cares for the environment through many voluntary actions?

Read more

Hydropower production has a regional and local impact on waterways and fish stocks. In order to sustain the fish stocks of the Kemijoki and Iijoki waterways and the sea area and to meet its fishery obligations, PVO-Vesivoima Oy stocked around 2.5 million fry in 2010. Together with Kemijoki Oy, 4.4 million fry were stocked in the Kemijoki sea and river area; of these, PVO-Vesivoima Oy's share was 17 per cent, or 0.7 million fry. On the Iijoki River, transporting of river lampreys past dams and power stations was very successful. Around 63,000 river lampreys were transported on the Iijoki River, clearly exceeding the obligation of 60,000. Likewise, the number of transported river lampreys on Kemijoki – 115,000 – exceeded the shared obligation of PVO-Vesivoima Oy and Kemijoki Oy, which amounts to 100,000.

The construction of a second fishway, to be built at Isohaara Power Plant, was started by the Centre for Economic Development, Transport and the Environment for Lapland. The fishway, located in the timber rafting tunnel of the old Isohaara plant, is expected to be completed in the summer of 2011.

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Nuclear power and the environment

Nuclear power production complies with environmental permits

The operations of TVO's nuclear power plant units complied with the company's environmental policy, environmental permits and environmental management system, with the exception of a slight excess of a concentration limit at a waste water treatment plant. The company's EMAS-registered environmental management system, which also covers the construction phase of OL3, meets the requirements of the international standard ISO 14001.

The greatest environmental impact by the Olkiluoto nuclear power plant resulted from the heat released into the sea via cooling waters, but any other environmental impact was negligible. As was the case in previous years, radioactive emissions into the air and water were minimal and considerably below the authorised limits. During the year, one significant environment-related deviation took place when some oil was spilled on the ground. Measures to offset the damage were started immediately, and the resulting impact remained low.

Read more at www.tvo.fi »

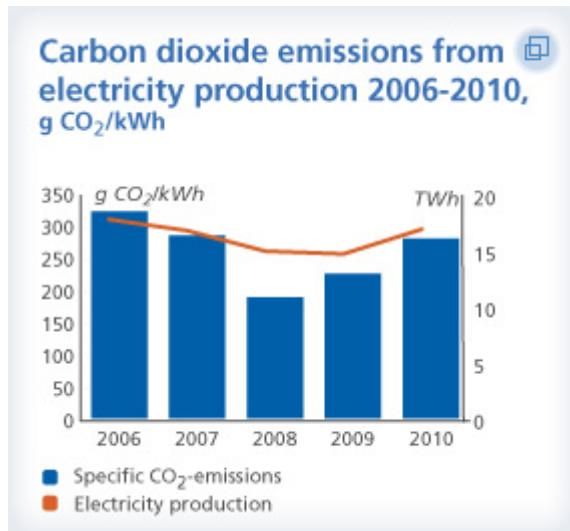
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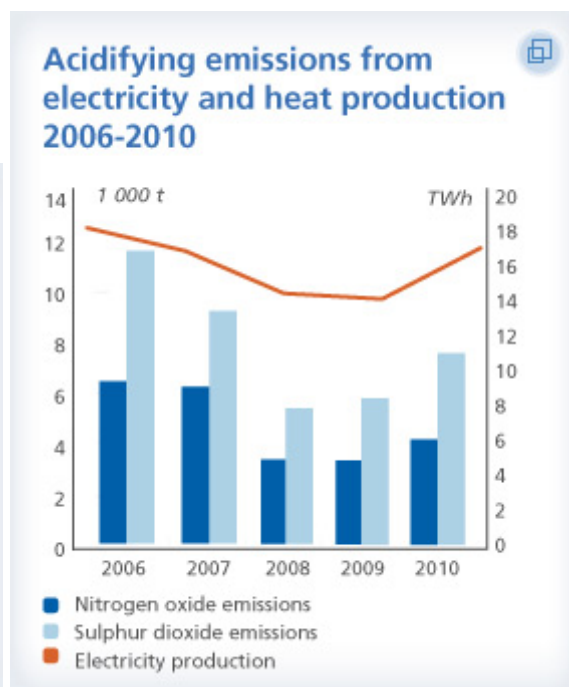
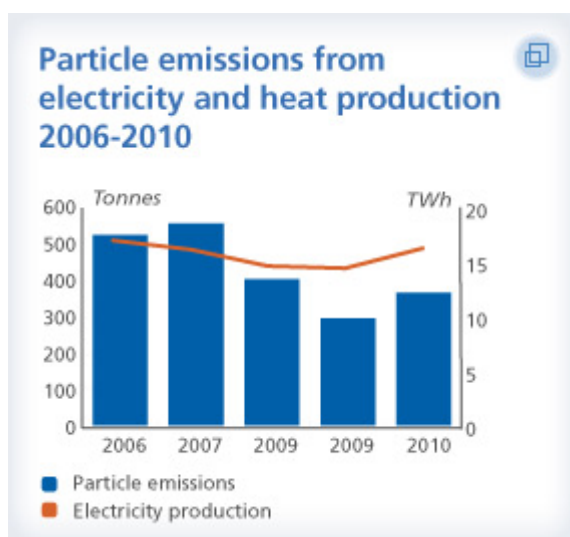
Thermal power and the environment

Emissions of thermal power production increased with production



Pohjolan Voima's thermal power plants use coal, peat, wood fuel, agro bio mass and refuse-derived fuels as primary fuels and some natural gas and oil as auxiliary fuels. The most significant environmental impact of thermal power production concerns the atmosphere. Emissions into the air from thermal power plants vary according to production volumes and fuels. In 2010, an increase in production volumes caused the carbon dioxide emissions from fossil fuels to reach 5.6 million tonnes.

Consequently, other emissions into the air increased as production volumes rose: sulphur dioxide emissions reached 4.1 thousand tonnes, nitrogen oxide emissions 7.5 thousand tonnes and particle emissions 0.4 thousand tonnes.



In April 2010, some lubricating oil leaked into the cooling water channel at Kristiina power plant. The leaked oil could be retrieved, and the environment incurred no damage. Steps have been taken to avoid a similar incident in the future.

Finding good use for by-products

A total of 374,000 tonnes of fly ash, bottom ash and gypsum were produced, fly ash and gypsum as by-products from flue gas cleaning. Of this volume, 47 per cent was reutilised in earth construction and the construction industry or as forest fertiliser. Reutilisation levels continued to decrease compared to the satisfactory level of over 70 per cent in 2007 and 2008. The main reason for this is the delayed recovery of reutilisation of ash in earth construction, which slowed down during the recession. Nevertheless, the aim is to reuse a maximum share of these by-products of thermal power production as raw material that could replace non-renewable natural resources, such as rock and stone.

Pohjolan Voima's by-products have been registered according to the requirements of the European Community's REACH regulation. The new Waste Tax Act that entered into force at the beginning of 2011 makes dumping of fly ash and gypsum in landfill subject to waste tax.

- **[Read more about the production year of thermal energy.](#)**
- **[Read more about environmental issues in thermal energy production »](#)**

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Wind power and the environment

In selecting sites for building wind power plants, particular attention is paid to the impact on the landscape, noise problems and changes in conventional land use. The environmental impact of wind power has been studied extensively during environmental impact assessments. Birds and bodies of water in the existing wind power production areas are monitored as required under the permit conditions.

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Investments

Pohjolan Voima is a major investor in various forms of new production capacity, particularly nuclear power and the production of renewable energy. With its investments, Pohjolan Voima also wants to ensure the continued operability of its power plants.

Investments in nuclear power

Investments in hydropower

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Investments in nuclear power

Olkiluoto 3

The civil construction works at the OL3 nuclear power plant unit currently under construction in Olkiluoto, Eurajoki, are, for the most part, completed. Several major components, such as the reactor pressure vessel, the pressurizer and three steam generators, were installed in 2010. The manufacture of the remaining components was in its final stage, and installation and pipeline welding works continued at the reactor plant. The number of personnel at the construction site at the end of 2010 was slightly over 4,000. The safety level at the site remained good.

The OL3 plant supplier has informed TVO that the major part of the work will be completed in 2012. According to the plant supplier, commissioning will take about eight months, and operation will start during the latter half of 2013.

[Read more about the OL3 project »](#)

Olkiluoto 4

On 1 July 2010, the Finnish Parliament approved the favourable decision-in-principle made by the Finnish Government on 6 May 2010 regarding the construction of OL4 in Olkiluoto.

Preparation of the tender material for the OL4 project, project planning, verification of licensing practices, and assessment of implementation alternatives continued. Recruitment to increase the personnel resources for the project was initiated in late 2010. The ground surveys begun at the plant site.

The planned electricity generation capacity of the new plant unit is between 1,400 and 1,800 MW, and the maximum heat generation capacity is 4,600 MW. The reactor type may be either a boiling water reactor or a pressurized water reactor.

[Read more on the OL4 project »](#)

A capacity increase at Olkiluoto 1

In 2010, unit 1 at Olkiluoto nuclear power plant had the most extensive annual maintenance in the history of the plant. Thanks to the improvements made during the annual maintenance, the efficiency of the turbine island improved and the unit's overall electricity generation capacity increased. At the beginning of July, the nominal net electricity generation capacity of OL1 was stepped up from 860 MW to 880 MW.

At Olkiluoto 2, similar major improvements, plus replacement of a generator, will take place in May-June 2011.

Read more at **www.tvo.fi** »

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The bioenergy programme

During the last 20 years, Pohjolan Voima and its shareholders have built 70 per cent of the new bioelectricity production capacity in Finland. The fifteenth bioenergy plant belonging to Pohjolan Voima's bioenergy programme will be built in Hämeenkyrö. In 2010, new bioenergy plants were inaugurated in Lappeenranta and Kerava. An increase in the use of bioenergy is under consideration in existing power plants as well.

Newest bioenergy plant will be built in Hämeenkyrö

Pohjolan Voima, Leppäkosken Sähkö and M-real have agreed to build a new bioenergy plant in Hämeenkyrö at M-real's Kyrö industrial site. The Hämeenkyrö bioenergy plant is Pohjolan Voima's fifteenth bioenergy plant project. Construction work is planned to begin in the spring of 2011, and the plant will be completed in autumn 2012. Its electricity production capacity will be 12 MW and thermal energy production capacity 55 MW, and its main consumers are M-real's Kyrö mill and the customers of Leppäkosken Sähkö. The cost of the project is estimated to be € 50 million.

The bioenergy plant project involves constructing a new boiler unit and the associated fuel reception and handling systems. The new boiler unit will be situated near the existing mill power plant, using existing equipment to the largest possible extent.

The fuels to be used in the new plant include wood chips and other wood-based fuels, as well as peat as an auxiliary fuel. Once the Hämeenkyrö bioenergy plant is completed, it will replace energy production based on natural gas, which is a fossil fuel, and increase the use of Finnish energy sources in the region.

Kaukaan Voima Power Plant – a major bioenergy consumer

Kaukaan Voima's bioenergy plant, a joint venture between Pohjolan Voima, Lappeenrannan Energia and UPM, was inaugurated in May 2010. The plant is located at UPM's Kaukas paper mill site in Lappeenranta. It produces process steam and electricity for UPM's Kaukas mill, and electricity and district heat for Lappeenrannan Energia.

Kaukaan Voima's bioenergy plant is the largest bioenergy consumer in Finland. Its fuels include bark, wood fuels and peat. The plant's capacity is 125 MW for electricity, 110 MW for district heat and 150 MW for process steam.

Bioenergy programme introduced to the Helsinki region in Kerava

Kerava bioenergy plant, a joint venture between Pohjolan Voima and Keravan Energia, was inaugurated in March 2010. This meant that Pohjolan Voima's bioenergy programme was extended up to the Helsinki region for the first time. The new power plant produces electricity and district heat for the City of Kerava and process heat for local industry.

The power plant is fuelled by wood fuels and peat. In terms of energy production in the area, the plant contributes to an increase in the use of Finnish energy sources and to a partial replacement of fossil-based natural gas. The capacity of Kerava bioenergy plant is 21 MW for electricity, 48 MW for district heat and 10 MW for process heat.

Biomass gasification under consideration

The construction of two biofuel gasifiers is under consideration in Vaasa and Kristiinankaupunki. The gas generated would then be burned with coal in the coal boiler. The aim is to replace coal with Finnish energy sources and, at the same time, contribute to a decrease in the carbon dioxide emissions from power plants.

Biomass gasification is a new technology developed in Finland which has not been used before on the scale now being planned. Pohjolan Voima and EPV Energia are planning the construction of a 130-MW biogasifier near the coal-fired power station owned by Vaskiluodon Voima, an affiliate of Pohjolan Voima. With the gasifier, up to 25 to 40 per cent of the present consumption of coal could be replaced. Also under consideration is the construction of another gasification plant, which would be built near Kristiina power

plant's coal boiler and have a fuel power of approximately 100 MW. This plant would be fired by biofuels and peat. The gasification plant would replace between 20 and 50 per cent of current coal consumption.

In 2010, the Vaskiluoto power plant was granted an environmental permit, allowing it to start using biogas. At Kristiina power plant, applications have been submitted for an environmental permit for a similar gasification plant, and also for a new multi-fuel boiler that could replace the old oil-fired condensing power plant altogether.

Studies underway on torrefying biomass into biocoal

Pohjolan Voima and Helsingin energia are studying the manufacturing possibilities and usability of torrefied wood-based biomass at coal-fired power plants. Through a process called torrefaction, it is possible to turn wood-based biomass into carbon-neutral biocoal that can be used in existing coal-fired plants without further processing.

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Pohjolan Voima year 2010

Investments in hydropower

Pohjolan Voima's hydropower plant renovation and efficiency programme (VESPA) is proceeding according to plan. In 2010, reparations took place at the Maalismaa hydropower plant.

It was decided that Pohjolan Voima's Kollaja project plans should be taken under further consideration. Based on the adjusted plan, the project's impact on Natura values have been reassessed in co-operation with a number of experts.

Hydropower renovation project continues at Maalismaa

In 2010, Pohjolan Voima's hydropower plant renovation and efficiency programme proceeded according to plan on the Iijoki River. Renewal of the second machine unit at Maalismaa power plant, which had begun in December 2009, was successfully completed in the spring 2010 before spring floods began. In December, the project went on with the renewal of the first machine unit.

During the renovation programme, initiated in 2005, the machine units of five hydropower plants located on Iijoki will be replaced or overhauled completely. Before the Maalismaa plant, the power plants at Kierikki and Haapakoski were renovated. After Maalismaa, the renovation work will proceed to the Pahkakoski power plant between 2011 and 2013. The hydropower plant renovation programme will increase the total capacity of the plants by about 30 MW. The project will continue until the mid-2010s, and the total costs will amount to about € 50 million.

Complete overhaul at Kaaranneskoski hydropower plant

A complete overhaul of the Kaaranneskoski hydropower plant, located on the Tengeliönjoki River, was finished in the spring 2010. The overhaul, which had been started in the autumn of 2009, involved a replacement of the power plant's turbine rotor, controls, automation system and main transformer and a renovation of the generator and other equipment. The plant's capacity increased to approximately 3 MW. The costs of the overhaul project were estimated to be a bit more than € 2 million. Kaaranneskoski is owned by Tornionlaakson Voima, an affiliate of Pohjolan Voima and Tornionlaakson Sähkö.

Adjustments to Kollaja plan

Pohjolan Voima has decided to reconsider the Kollaja plan drawn up in 2008. To ensure that the Natura values of the Pudasjärvi estuary will be preserved, a number of changes will be made to the plan.

Pohjolan Voima's plan concerning the reservoir and hydropower plant at Kollaja was completed in connection with the environmental impact assessment at the end of 2008. A separate Natura assessment was drafted on the Pudasjärvi estuary. Contrary to the conclusion of the assessment, in a statement issued in October 2009 the North Ostrobothnia Regional Environment Centre was of the opinion that the Kollaja project would significantly deteriorate the Natura values.

In 2010, Pohjolan Voima strengthened its assessment of the impact on nature in co-operation with a number of experts. In this context, a number of adjustments have also been introduced in the plan.

Read more about the Kollaja project at www.kollaja.fi » (in Finnish only)

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Pohjolan Voima year 2010

Wind energy projects

In 2010, Pohjolan Voima conducted studies on several onshore and offshore wind power plant projects. With its undersea foundation project, Pohjolan Voima is making a contribution to the planning of large-scale offshore wind farms.

Undersea foundation project advances the planning of offshore wind farms

How a foundation of a pilot wind power plant located at the bottom of the sea and the plant tower on top of it can cope with wintry weather conditions has been studied in an undersea foundation project conducted near the Ajos wind farm in Kemi. Measuring data gathered from the undersea steel foundation – the first in Finland – will advance the planning of large-scale offshore wind farms.

The foundation and the tower were built in 2009. Measurements on the foundation technique's ability to withstand the stress caused by wind, ice and the swell of the sea have been conducted all year round. According to the measurement data from the winter season of 2009/2010, the steel foundation constructed in the fast ice zone tolerated the winter stress very well. In order to collect more comparison data, the measurements will continue over another winter season.

The co-operation partners of the undersea foundation project include several other organisations planning to construct more wind power. The costs of the project are estimated to be € 2.5 million. The Ministry of Employment and the Economy has granted investment aid for the project.

The aim is to develop the undersea foundation and the tower into an operating wind power plant unit in 2011. The pilot wind power plant would become the 11th wind power plant unit at the Kemi wind farm.

EIA for Kristiinankaupunki offshore wind farm completed

The environmental impact assessment for the offshore wind farm planned off the coast of Kristiinankaupunki was completed in February 2010. The coordinating authority issued its statement on the EIA report in May.

The total production capacity of the offshore wind farm in Kristiinankaupunki would be between 240 and 400 MW. There would be around 70 plant units to be built. The project also includes a number of onshore wind power plant units.

[Read more on the project »](#)

EIA for Oulu–Haukipudas offshore wind farm completed

The environmental impact assessment for the large-scale offshore wind farm planned off Oulu and Haukipudas was completed in March 2010. The coordinating authority issued its statement in July.

According to plans, the number of plant units in the Oulu–Haukipudas wind farm would be approximately 140, with a combined power of 500–800 MW. Pohjolan Voima is studying the possibility of constructing the offshore wind farm together with Oulun Energia.

[Read more on the project »](#)

Environmental impact assessed for the extension of Kemi offshore wind farm

According to plans, the Ajos offshore wind farm in Kemi will be extended and the production capacity increased to about 200 MW. There would be about 60 new power plant units constructed in the sea area south of Ajos. The project also includes a number of onshore wind power plant units to be built near the existing Ajos wind farm. The environmental impact assessment report on the project was completed and submitted to the coordinating authority in October 2010.

Studies conducted on increasing onshore wind power

Extensions to the existing wind farms are planned in Kristiinankaupunki, Kokkola and Kemi. In addition, there are studies underway concerning the possibility to build new wind farms onshore and inland on locations where wind conditions are favourable. Planned new sites include Raahe, Lapua and Merikarvia.

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