

Briefing on Pyhäjoki nuclear power plant

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Pyhäjoki nuclear power plant in short

- The construction project is led by a consortium called Fennovoima. Fennovoima used to be shared between the German energy giant E.ON (34% share) and a domestic mixture of local and regional power companies (36.3% share) and industrial and service companies (29.7%). A group of Finnish companies with around 6% of shares withdrew from the project on the 29th of August 2012. E.ON left the consortium on 24th of October 2012. These withdrawals left a hole of around 40% in the ownership of the project.
- Financial trouble led to firing the company CEO on the 1st of October 2012 and replacing the chairman of the company board of directors on the 12th of September 2012.
- Largest remaining owner is the steel producer Outokumpu which currently owns about 15% and says it's not intending to increase its ownership.
- Fennovoima is in direct negotiations with the Japanese-American Toshiba-Westinghouse for an EU-ABWR reactor. The company is also checking the possibility to order a "mid-sized" reactor such as Rosatom's VVER-1200 or Areva's Kerena.
- New NPP is supposed to achieve grid connection in 2020. This schedule assumed reactor contract in late 2011. This means the project is already delayed by over a year.
- Political permission for project was granted by the parliament in July 2010 with a five year time limit to apply for construction permission from the national government.
- Fennovoima has failed to acquire all land on the planned building site. In October 2012, the company initiated compulsory purchase process to gain ownership of remaining land areas.
- Fennovoima's solution for nuclear waste was to lobby the Finnish government to grant the company a share of the nuclear waste disposal facility owned by the other Finnish nuclear operators. So far the government has remained neutral on the issue.

Overview of Fennovoima

Fennovoima exists solely to build a nuclear power plant in Pyhäjoki or the alternative location of Simo in Finnish Lapland and does not have any other business operations.

Fennovoima is currently owned by 61 companies with the steel manufacturer Outokumpu being the largest owner. Outokumpu has around 15% share while most of the owners carry shares of less than 5%ⁱ. Many of the owners are municipal power companies. Originally the project was steered by the German energy giant E.ON which had a 34% stake in the company and was the only shareholder with significant monetary reserves and prior knowledge of nuclear projects.

Some of the Fennovoima companies changed along the road but the collapsing of the company's ownership base started in the second half of 2012. Six companies representing around 6.6% of shares announced leaving the company on the 29th of August 2012ⁱⁱ, followed by E.ON leaving the project on the 24th of October 2012ⁱⁱⁱ. Fennovoima has so far failed to find any new investors leaving the company with a 40% gap in funding. E.ON's departure might also provide a regulatory problem as Fennovoima's permission to build the nuclear power plant was granted on basis of E.ON providing significant part of the nuclear know-how^{iv}.

The company reacted to the negative changes in its ownership by firing the CEO on the 1st of October 2012^v. Before this, they had already switched the company board chairman on the 13th of September 2012^{vi}. On 10th of December 2012, Fennovoima Chief Nuclear Officer announced he will leave his office in March 2013 and only act as an external consultant in the future^{vii}. On 13th of May 2013, also the Construction Director left the company^{viii}. With these changes of staff, all of the original senior management of the project is gone.

Fennovoima will need to be recapitalised by the summer of 2013 or it will run of money and stop operations^{ix}.

Fennovoima has been recently in talks with the Russian state via the Rosatom corporation about a possible build, own, operate contract including Rosatom buying into Fennovoima and supplying a VVER-1200 type of reactor^x. It's unclear if this would be possible since Rosatom was not mentioned among the reactor suppliers in Fennovoima's original license application^{xi}.

Reactor types

Fennovoima's application for a decision-in-principle, i.e. the political new-build permission, mentioned three possible reactor types: Kerena and EPR by Areva and EU-ABWR by Toshiba-Westinghouse^{xii}. Areva chose not to leave a bid for Kerena and later Fennovoima also dropped the EPR^{xiii}.

Fennovoima's last remaining large scale reactor model is the EU Advanced Boiling Water Reactor (EU-ABWR), offered to Finland by the Japanese-American Toshiba-Westinghouse. This reactor would have a 1600 MWe capacity. Several ABWRs have been built in Japan by Toshiba and GE-Hitachi but none outside Japan. The Japanese models also have the maximum capacity of 1380

MWe, therefore being smaller than the Finnish project would be^{xiv}. The design would have to be radically altered to achieve increased capacity. Lately Fennovoima has said they might also opt for a smaller scale ABWR reactor due to lack of financing^{xv}.

At the moment Fennovoima says the supplier will be selected “during 2013”^{xvi}. According to the decision-in-principle, the project was supposed to be completed in 2020, with the contract with the supplier being signed in 2011^{xvii}. This means the project is already delayed by over a year before any construction work has started.

Local situation at the planned building site

Fennovoima plans to build the nuclear power plant at Pyhäjoki. Pyhäjoki is a municipality of approximately 3000 inhabitants in Northern Finland, south from the city of Oulu. While the municipality of Pyhäjoki has accepted the nuclear power plant in its local and regional plans, the population remains split in opinion. There is an active and well organised local resistance movement called Pro Hanhikivi^{xviii}.

Fennovoima doesn't own the whole planned building site but plans to expropriate the remaining parts by a first of a kind court procedure. Fennovoima initiated the expropriation procedure on 4th of October 2012^{xix}.

Part of the regional land use plans are still being contested in the administrative court by Pro Hanhikivi and the petitions committee of the European Parliament is also looking into some of them^{xx}.

The actual supposed building site is a historical natural conservancy area which includes a massive stone (Hanhikivi, “Goose Stone”) supposedly marking the medieval border of 1323 between Novgorod and Sweden. The peninsula has a rare ecosystem, having emerged slowly from the sea and contains a number of endangered plant and bird species. A part of it is also part of the Natura 2000 network^{xxi}.

Political process

After the Chernobyl nuclear catastrophe, Finland introduced a three stage approval process for new nuclear power plants. A nuclear power plant (NPP) must first obtain decision-in-principle from the parliament, then construction permission from the government and finally operating license from the government^{xxii}.

The Pyhäjoki NPP obtained decision-in-principle in July 2010, with all political parties splitting in the vote except the Greens (unanimously against). The process is mostly political but the parliament is supposed to consider the domestic need of energy and the production of an NPP should not go predominantly to exports.

In the 2008 governmental climate & energy strategy, the business-as-usual (BAU) scenario estimates the power consumption to peak at 103 TWh/a in 2020 and the official efficiency target

was 98 TWh/a in 2020^{xxiii}. When preparing the nuclear programme proposal for the parliament, the government dropped the efficiency target to fit in new nuclear reactors and raised the BAU to 110 TWh/a in 2020 without conducting any new modelling^{xxiv}. These figures were clearly inflated and in a new BAU scenario released in 2013 the estimate was again lowered to 98 TWh/a, meaning the new nuclear reactors production would be predominantly exported^{xxv}.

According to the decision-in-principle, Fennovoima has until 1st of July 2015 to make a contract with a reactor supplier and prove the technical and financial feasibility of the project after which it can apply for the construction permission. The construction permission itself is supposed to be only a technical checking point for the government. If the construction permit is not applied for, the decision-in-principle will become obsolete^{xxvi}.

Financing of the Pyhäjoki NPP

In the decision-in-principle application, Fennovoima estimated the total cost of the project to be 4-6 billion euro. The price tag for a 1600 MWe Olkiluoto 3 EPR project in Finland has already gone up to at least 8.5 billion euro excluding profit margin for the supplier company Areva.^{xxvii}

It's unlikely that a group of relatively small companies would be able to obtain the required financing. Fennovoima will have to look for some new investors for the project to continue. Any financing will probably also be dependent on credit guarantees from the government of the supplier company's home country.

No solution for disposal of nuclear waste

Fennovoima is not an owner in the nuclear waste company Posiva that aims to build a deep geological disposal site at Olkiluoto. Posiva has refused to sell a stake, citing no more space in the potential repository^{xxviii}. Fennovoima has reacted by asking the government to enforce its access to the Posiva project^{xxix}. The Finnish government set up a mediating procedure between Fennovoima and Posiva but didn't come to any conclusion^{xxx}.

Although the decision-in-principle does not require Fennovoima to come up with a solution of dealing with the high level nuclear waste to apply for construction permission, having to build its own nuclear waste repository would further increase costs of the project.

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