

To the governments of Finland and Sweden,
Copy for information to the Russian government

Statement adopted at the International Conference
NUCLEAR POWER AT THE GULF OF BOTHNIA?
On Fennovoima plans, nuclear waste, and renewable energy
held in Skellefteå 21-22 May 2016

**The Finnish-Russian plans
to build one or more nuclear reactors on the eastern
shore of the Gulf of Bothnia must be stopped!**

**The company Fennovoima's plans in Pyhäjoki
on the shore of the Gulf of Bothnia:**

- foil all of our quest for a sustainable society,
- leave our generation's mistakes to future generations,
- is irresponsible, as the Gulf of Bothnia is an extremely sensitive inland sea and the researchers believe that a nuclear power plant could damage its ecosystem seriously, even during normal operation,
- entails unacceptable risks for a major reactor accident, with unforeseeable consequences,
- is not ethically acceptable as a credible repository for the waste for at least a hundred thousand years can not be found anywhere in the world,
- is unnecessary, since the performance of energy efficiency, renewable energy, and energy storage is constantly increasing, while the price drops.

We appeal from the depths of our hearts

- to you, as elected representatives in Finland and Sweden that you do everything in your power to stop the Fennovoima full-scale environmental experiments with the Gulf of Bothnia, our common, fragile inheritance.

We demand

- that the Swedish and Finnish Governments begin negotiations on this crucial issue.

Background description to the statement

The Finnish-Russian company Fennovoima has advanced plans to build a nuclear power station at the Gulf of Bothnia shore. This has aroused great concern and strong protests in both Finland and Sweden.

As part of efforts to increase awareness of the Fennovoima project, the problem of nuclear waste management as well as the alternative energy solutions that can be found, the conference "Nuclear Power at the Gulf of Bothnia?" was held in Skellefteå the weekend of 21 to 22 May 2016. It was arranged by the network Nuclear Free Gulf of Bothnia in cooperation with The Swedish Anti-nuclear Movement (FMKK), The Swedish Environmental Movement's Nuclear Waste Secretariat (Milkas), Women for Peace in Finland, and Women Against Nuclear Power in Finland.

Questions and viewpoints received from conference participants have contributed to the drafting of this document.

Background on Fennovoima plans

If the plans of the company Fennovoima to build Finnish-Russian nuclear power in the Gulf of Bothnia are realized, they will lead to very high risks in terms of both the environment and safety, and the new conditions of life for the region around the Gulf of Bothnia and the Kvarken.

All nuclear establishment implies, even in normal operation, environmental stress for the surrounding nature. The risk of a large-scale accident with dire consequences can never be entirely ruled out. Human failures, natural disasters, terrorism, technology failures, and "the unforeseen" always must be counted in as possible factors.

Due to global warming, the future is more unpredictable than ever. As judged by, among others, the UN climate panel (IPCC), climate change will increase the amount of extreme weather events, like more and stronger storms, more floods and more droughts. This will affect, for instance, food security, causing accelerating socio-economic stress on our societies. This could lead to increased political instability and more conflict. In this very uncertain historical stage it is unjustifiable to build vulnerable nuclear power.

In addition to the above general risks, which apply to all nuclear power, in the case of the Fennovoima, there are two specific factors that absolutely should disqualify the project: Rosatom and the Gulf of Bothnia.

Rosatom, Russia's wholly state-owned nuclear weapons and nuclear energy industrial group, will be building the reactor and supplying the plant, and they are, with their 34%, Fennovoima's largest single shareholder. They will also participate in the daily operations of the plant and will deliver nuclear fuel for at least ten years. The Putin regime has also promised billions in loans for the project financing.

Moreover, there are indications that Rosatom, hit by several well-known corruption scandals, also lacks a culture of safety, which is liable to affect the technical security.

How the extensive Russian involvement at the shore of the Gulf of Bothnia may affect the security situation in the region is an open question. Are there geopolitical reasons for the establishment?

The nuclear fuel production of Rosatom is heavily criticized, as it involves major environmental and health problems for parts of the Russian population. Accepting the Fennovoima nuclear power construction means accepting poor health conditions for many Russian citizens.

The Gulf of Bothnia lends itself very poorly for nuclear power as it is a small, enclosed and shallow inland sea with a small body of water, and thus has a poor ability to dilute the low-level radioactive and warm cooling water. It requires huge amounts of water to cool a reactor (40-45 cubic meters / second) which is then returned to the sea with a temperature increase of between 10-12° C. Of the 3200 MW thermal power of the reactor, almost 2/3, 2000 MW, will be flushed out and warm the Gulf of Bothnia, while only a small portion, 1200 MW, will become electricity.

The brackish water of the Gulf of Bothnia is a very specific environment with few species. In the open letter to the Finnish Government published by 14 scientists 31/7 2015 in Hufvudstadsbladet, they write, among other things, that "we already know that contaminants accumulate easily in the food chain in the Baltic Sea", and that "the risk is great that even small releases of radionuclides will accumulate efficiently in this environment. "

The Gulf of Bothnia has already suffered severe damage from high levels of dioxins and PCBs. Climate change, with raised average temperature and increased rainfall, is expected to have a major impact in northern Sweden and Finland. Research developed by Agneta Andersson, professor of pelagic ecology at Umeå University, shows that among other things we can expect more brown water with increased bacterial activity, decreasing phytoplankton production and declining fish stocks.

Deliberately adding the additional environmental stress and the risks associated with the Fennovoima project to the already expected climate-related impacts - could that be interpreted as anything other than disregard of the marine environment of the Gulf of Bothnia?

Background on nuclear waste

Uncertainty about the technical solutions for final disposal of high level nuclear waste remains. The Fennovoima planned measures will result in new production of large quantities of nuclear waste. Thus, they are ethically unacceptable since the risks will be passed on to future generations.

During the 60 years that the nuclear power plant at the Hanhikivi point is expected to be operational, each reactor will create a total of 1200-1800 tons of

spent nuclear fuel. Before the end of June 2016, Fennovoima must present their plan for disposal of the waste to the Finnish Government.

The high-level waste must be kept separate from living organisms for at least a hundred thousand years, making it difficult to find technical solutions which could credibly pretend to ensure safety during this enormous period of time.

Nowhere in the world is there any disposal facility in operation. Last year the Finnish government became the first country in the world to give permission for the construction of a repository for high level nuclear waste. The nuclear waste company Posiva was granted a permit to extend the experimental cavern Onkalo into a permanent repository for 6500 tons of uranium.

The Swedish Nuclear Fuel and Waste Management, SKB, has collaborated with its Finnish counterpart Posiva for many years, to develop the method KBS-3. In Sweden, however, criticism by, among others environmentalists and researchers at KTH has been strong, since tests have shown that there are indications that copper can corrode in oxygen-free water.

Independent researchers from China as well as the US have also demonstrated copper corrosion in oxygen-free environments. In 2014 these findings were published in scientific articles. If the copper canisters with highly radioactive nuclear waste corrode, then there is risk for leakage to the environment after perhaps only 1000 years, considerably shorter than the hundred thousand years necessary to protect organic life.

A group of prominent geologists and geophysicists, among them Bill McGuire, professor of geophysics at University College in London, says that climate change may affect how the pressure on the earth's crust is distributed, which can lead to more and more earthquakes in the future. The geological conditions are very uncertain over time, so new reactors and subsequent new construction of high level nuclear waste are not acceptable.

It is very alarming that Finland has already gone ahead with the criticized KBS-3- method, despite the fact that Sweden has not yet decided to approve - or reject - the same method.

Background on renewable energy

Technology development and expansion in terms of efficiency, renewable energy, and storage take place today with a speed that few could have predicted a few years ago. Costs fall steadily and performance increases. Saving energy, so called "Nega-watts", is also a more attractive option than building new Finnish-Russian nuclear power on the shore of the Gulf of Bothnia.

Climate change requires society to rapidly phase out fossil energy. Construction of nuclear power, with the heightened security requirements after the Fukushima accident, has proven to be very expensive, and takes a very long time. Renewable energy has much shorter lead times, i. e. it is much faster from the planning stage to the initiation of energy. This is crucial for the timely stop of global warming.

Each energy source bears its own costs. Nuclear power, on the other hand, actually gets huge subsidies from society, as its externalities are not included in the price of production (eg environmental and health problems associated with the mining of uranium, the effect of the cooling water on the surrounding seas, future risks of high level waste, socio-economic problems, and clean-up costs for major disasters).

Finland's current Industry Minister Olli Rehn analyzed, before he took office in the government, very perceptively the Fennovoima impact on the future Finnish energy development in his blog 2014-09-28: "An economically insecure and politically handicapped investment in new Russian nuclear power will for years offset the necessary investments in renewable green energy. On that road Finland risks becoming the open-air museum of failed nuclear projects, while at the same time falling off the sled within the development of the green economy. "

Summary

The Gulf of Bothnia is a unique and valuable inland sea with a very fragile ecosystem. Climate change will cause major environmental stress on this small, fragile inland sea, which should therefore be protected from further environmental impact. A nuclear power plant always entails, even during normal operation, large scale negative impact on the surrounding ecosystem. Should the company Fennovoima be allowed to perform a full-scale environmental experiment in the small, closed, fragile inland sea that Sweden and Finland have in common?

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