



EPR: An expensive subsidised nuclear reactor for Finland

Greenpeace briefing June 5th 2005

In December 2003, the Finnish utility TVO signed a contract with a consortium of Framatome and Siemens (later Framatome ANP, part of the French Areva group) ordering a 1600 MW European Pressurized Water Reactor (EPR) for a fixed price of € 3.2 bn. The reactor, named Olkiluoto-3, is a financial fiasco and heavily subsidised by the French and German states. Under correct market conditions, TVO would have made a different choice. It could have ordered biomass and wind power at a much lower price. Greenpeace and the renewable energy federation EREF have therefore filed complaints with the European Commission for illegal state aid.

Illegal state aid complaints

Greenpeace filed a complaint with the European Commission in October 2004 for illegal state aid to the Olkiluoto-3 project. Another complaint has been filed by the European Renewable Energy Federation EREF in December 2004¹. The Commission confirmed in a letter of Nov. 5th 2004 to Greenpeace that it started its investigation. The Commission recently stated to Greenpeace that the investigation is ongoing.

The main subsidies

The French, German and to some extent also the Swedish governments are involved in subsidising the Olkiluoto-3 project. Also the Finnish government might end up with a huge cost for decommissioning and waste management some decades from now.

The main subsidies are:

- A €610M loan guarantee provided by France via its export credit agency COFACE, and the effect of this guarantee on other elements of the project's funding package. Export credit guarantees are normally used only in developing countries, where commercial risks are significantly higher. Within the EU internal market, such guarantees are regarded as a distortion of competition and as such are illegal.
- The Bayerische Landesbank (BLB) granted a low-interest loan to TVO of € 1.95bn at a rate of only 2.6%, far below the market conditions;
- The Swedish export credit agency SEK granted a guarantee to the Olkiluoto-3 project, as mentioned in their annual report of 2003.
- Framatome ANP signed a contract with TVO for a fixed price of € 3.2 bn. There are many indications that this is a dumping price. First, the price mentioned in France for the Flamanville project, is at least € 300 millions higher. Given its high cost, it is uncertain that this second EPR will ever be built. Second, additional security requirements made by STUK will increase costs. Thirdly, steel prices have increased considerably and are an important cost factor. And last but not least: The OL-3 project is already facing more than one month of delay for each month of actual construction.

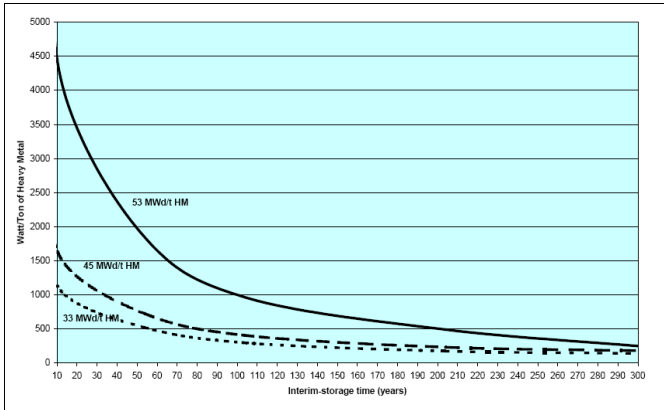
A financial fiasco for TVO?

Last May, TVO stated on its website that the OL-3 project is already facing a delay of 8-9 months. The Finnish Minister of Trade and Industry mentioned a 10 months delay. Although the capital costs of these delays will be covered by the Areva group, it should also be noted that each day of delay will generate a loss of electricity sales for TVO. For a very large reactor such as the EPR, losses could be as high as a half a billion euros in one year.

1 http://www.eref-europe.org/downloads/pdf/2004/EPR_Finland.pdf

Liabilities to the Finnish state

The provisions that will be established by TVO for its decommissioning and waste liabilities will most likely be insufficient to cover the full costs. The Finnish nuclear licensing authority STUK stated last year² that TVO could aim for a very high burnup of the fuel of the Olkiluoto-3 reactor, meaning that higher enriched uranium will remain in the reactor for a longer time. This spent fuel will become the most radioactive waste ever produced in a Finnish reactor, needing a much longer active cooling period (see graph) and complicating long-term management because of a higher actinide (very long living isotopes) concentration.



Furthermore, the OL-3 is a prototype and its decommissioning will thus be a first of its kind operation, increasing costs. Also, the size of the radioactive reactor components, their weight and the intensity of the neutron radiation might increase decommissioning costs.

Most of these costs will occur many decades from now, or even after more than a century of active cooling of the spent fuel. Active management of the waste might be needed for thousands of years from now.

Lessons from OL-3 on the economics of nuclear power

The nuclear industry and the Nuclear Energy Agency have been systematically underestimating the capital costs of a new reactor and overestimating the costs of renewable energy sources such as wind energy. A major factor in the biased calculations is the impact of the investment risk (and the related interest rates) on the 'lifetime levelised costs'. In a recent assessment, capital costs of wind energy are estimated to drop from some 700 €/kW to 550 €/kW in ten years from now³. This gives an average cost which is 3 times less than what the NEA is using in its 2005 report on the costs of electricity production⁴. The capital cost of the OL-3 project is officially at 2000 €/kW, and a French EPR would cost 2187 €/kW, but as mentioned above, this is a serious underestimation of the real capital cost. The UK 'Energy Review' of 2002 estimated the nuclear capital cost at some 4500 €/kW.

Very large and complex construction projects such as OL-3 have, as already demonstrated, a high risk of cost overruns, and should thus face high interest rates under fair market conditions. Renewable energy on the other hand is very modular, and a technology such as biomass or wind power is well established and has a low investment risk.

Given the high investment risk of nuclear power, the European utilities have massively turned away from it. The only exception, the OL-3 project, is becoming a clear demonstration of the incapacity of the nuclear industry to deliver anything in a more competitive environment. It should be noted that no reactor has been commissioned in the world in a competitive market. Since the start of Civeau-2 in 1999 in France, no reactor will be constructed in Europe for a period of more than 10 years. Meanwhile, the European wind industry has been adding more than 6,000 MW of power every year, the equivalent of 2 large reactors.

In a more detailed briefing, Greenpeace assessed the impact of the capital costs and investment risks on the cost of electricity generation⁵.

Period	Average Investment €/kW		
2004 to 2008	€ 729		
2009 to 2013	€ 618		
2014 to 2017	€ 559	€ 539.00	€ 556.00
2018 to 2020	€ 521		
			€ 568.00

EWEA/Greenpeace, Wind Force 12

For more information:

contact Jan Vande Putte at Greenpeace International: jan.vande.putte@int.greenpeace.org

² As stated by Keijo Valtonen, director of STUK's Office of Reactor & Safety Systems. Nuclear Fuel Jan. 31st 2005.

³ EWEA-Greenpeace, Wind Force 12, 2004.

⁴ NEA, *Projected Costs of Electricity Production – 2005 update*. published on the 16th of March 2005

⁵ Greenpeace International, *The real cost of nuclear electricity generation*. March 22nd 2005.