

NGO comment on the EIA procedure for the planned NPP newbuild in Varberg/Sweden

13 June 2025

The signatories welcome the possibility to submit a statement in this transboundary Environmental Impact Assessment (EIA) for the scoping procedure.

The EIA scoping document lists the topics of the future EIA report. In our statement, we recommend including topics that seem not to be in the scope yet or seem to be addressed insufficiently.

Reactor types

Vattenfall intends to build a new NPP with two big or three to five smaller reactors (SMR), with a total output of 2,800 MWe. No information is given on reactor types besides that they should be PWR or BWRs. It has to be noted that the so-called SMRs would be first-of-a-kind to be built in the EU. Therefore, **Vattenfall's claim that SMRs will take less time for construction and commissioning than large reactors needs to be proved in the EIA report.**

Alternatives

The EU EIA laws and the Espoo Convention require the assessment of alternatives of a project. The EIA scoping documents informs that a location investigation has been carried out resulting in the Värö Peninsula in direct vicinity to the Ringhals nuclear site. Additionally, alternative reactor technologies and designs will be in the scope of the EIA report.

However, **we recommend that the EIA report will presents energy production alternatives to nuclear power.** In response to the climate crisis, energy efficiency and energy saving measures have to be the most important options for an alternative scenario, new electricity production should be based on renewable energies with its steadily decreasing costs and faster availability.

A long-term prognosis of the Swedish energy needs should be part of the EIA report.

Security

Any new NPP needs to be as secure as possible against acts of war and terrorism, especially as the Russian war against Ukraine showed that NPP have become main targets of attacks.

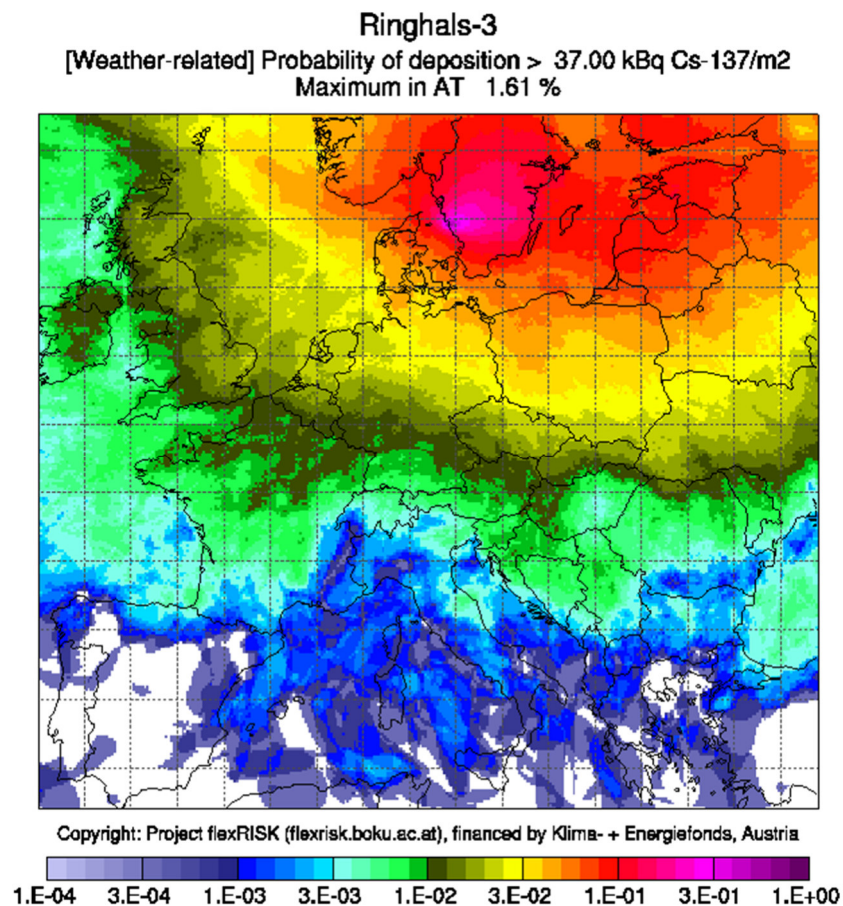
The EIA report should cover measures that will be taken to ensure that the NPP will not be vulnerable to drone attacks, to cyber-attacks and to other acts of war.

Risk of severe accidents

The most important question is: Can an accident occur in the NPP that has significant impacts on the surrounding areas, and also on other countries? Even if a severe accident has a very low probability, the risk is not eliminated.

In its background document on transboundary impacts that was also submitted in the scoping procedure, Vattenfall describes a hypothetical accident with a core meltdown. The source term for Cs-137 for this accident is described as $1.0\text{E}+14$ Bq (=100 TBq or 0.1 PBq). A calculation for distances up to 800 km was conducted. The assessment results in lifetime doses of below 1 mSv at distances greater than 250 km.

When comparing these results with results of the research project flexRISK, this hypothetical accident does not seem to be the worst that could happen. FlexRisk assesses weather-related risks of severe accidents. For Ringhals-3, a PWR with 1037 MWe, an Interfacing Systems Loss-Of-Coolant Accident (ISLOCA) accident was assessed with a release of 109.41 PBq Cs-137. The following flexRISK figure shows the weather-related risk for Europe to be contaminated with Cs-137 above 37 kBq Cs-137 per m^2 in case of such an accident happening.



Under unfortunate weather conditions, many countries in Europe could suffer a high Caesium contamination of more than 37 kBq/m^2 ; f.e., the maximum weather-related risk for Austria, which is in a distance of about 1,000 km to the Ringhals site, is 1.61%.

This flexRISK assessment underlines that it is not enough to calculate contamination or doses for a distance up to 800 km like it was done for in the EIA scoping documents. Calculations should cover all of Europe.

Moreover, the source term of 100 TBq Cs-137 (0.1 PBq) for a beyond design based accident (DEC) is too low, an accident with a larger source term could occur. One of the reactor types that could be chosen is the AP1000. According to Sholly et al (2014¹), the Cs-137 inventory of an AP1000 is 4.18E+17 Bq. In case of a DEC with a containment bypass resulting from steam generator tube failure, 27.2% of the Caesium Group are expected to be released, corresponding to 1.14E+17 Bq Cs-137 (114 PBq). This source term is similar to the one used for the above introduced flexRISK results.

The EIA report shall include accident calculations with the highest source term for which the risk is not zero, and dispersion calculations for all of Europe.

Results from calculations should not only cover doses but also contamination. Some countries in the EU, among them Austria, have to start agricultural protection measures at an expected level of contamination with Cs-137 or 650 Bq/m²². **Accident calculations have to include all distances where a possible contamination with Cs-137 and I-131 could be over the respective contamination levels triggering agricultural countermeasures.**

Combined effects

At the Ringhals site, two reactors are still in operation. If lifetime extension is foreseen, **effects of a parallel operation of the new NPP with the old ones need to be assessed in the EIA report.**

Nuclear waste management

Before any new-build, Sweden should ensure that it has enough capacities for interim and final storage of the resulting nuclear waste.

The EIA report has to prove the safe management of nuclear waste.

With best regards

¹ http://www.risk.boku.ac.at/download/pub/2014/ISR_report_source_terms_poland.pdf

² MASSNAHMENKATALOG (2022): Maßnahmenkatalog für radiologische Notfälle. Gesamtstaatlicher Notfallplan. BMK. Wien.