

INFORMATION ON CARBON FOOTPRINT CALCULATION FOR NUCLEAR ELECTRICITY PRODUCED IN OLKILUOTO

Background

We have analysed the carbon footprint of the nuclear electricity we produce in Olkiluoto in accordance with the EU taxonomy requirements.

The objective of the analysis was to verify that the carbon footprint of the nuclear electricity we produce is below the 100 g CO₂ e/kWh threshold value set in the EU taxonomy and to produce additional information for DNSH reporting.

In addition, we acquired additional information on the factors and lifecycle phases behind the environmental impacts that we cause to enable us to plan even more focused actions in order to reduce the environmental impacts.

The analysis was conducted in compliance with international standards that guide life cycle assessment and carbon footprint calculation, ISO 14040, ISO 14044, and ISO 14067. The Product Category Rules (PCR) which guide the Life Cycle Assessment (LCA) of energy products and provide more detailed guidelines for the implementation of LCA analyses for nuclear power energy, for example, were also taken into account.

The analysis was conducted by Etteplan Finland Oy. The analysis has been verified by a third party, i.e., compliance with the aforementioned standards has been verified in a critical review process. The critical verification review was carried out by AFRY Finland Oy. The Verification Report has been published on TVO's website.

Scope of application

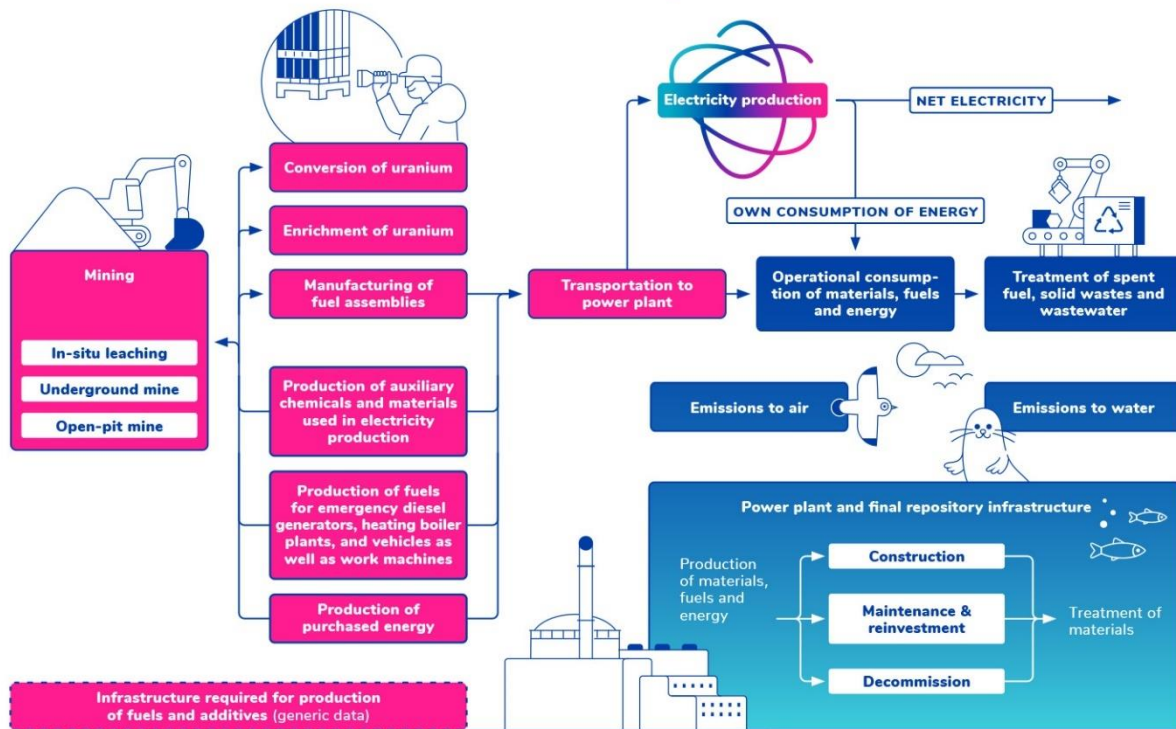
The analysis results describe the nuclear electricity produced in Olkiluoto in 2022. The results have been calculated per one kilowatt-hour delivered to customers.

The fact that the OL3 plant unit was not yet in full production in 2022 increases the carbon footprint for 2022 compared to years thereafter.

The entire life cycle of the nuclear power plant has been covered in the calculation, including all stages from uranium mining all the way to the final disposal of nuclear waste. The construction and decommissioning of infrastructure for the actual nuclear power plant, nuclear waste management, the electricity transmission network and the procurement of nuclear fuel are also covered.

Production of fuel and auxiliaries

Nuclear power plant operation



Boundary conditions for calculation

The analysis utilises primary data representing the year 2022 on the production of electricity in Olkiluoto and on nuclear waste management. Supplier-specific primary data on inputs and deliverables have also been acquired from the supply chain of nuclear fuel. Where primary data has not been available, secondary data from literature as well as from the Sphera professional 2023 and Ecoinvent 3.9.1 data bases have been used.

A default service life of 60 years has been used for the Olkiluoto plants. Based on that, all the inventory data have first been distributed over this time period and finally per the amount of energy produced during the year. When presenting the results separately for the OL1, OL2 and OL3 plant units, an allocation base determined based on the net energy production volumes of the units has been applied where plant-specific data have not been available. More detailed information about the allocation principles can be obtained by requesting further information from the person indicated at the end of this document.

Areas for which no data were available have been excluded from the calculation. It can be concluded, however, that all the key factors which impact the carbon footprint of nuclear power have been included in the calculation. More detailed information about the areas excluded from the calculation can be requested from the person indicated at the end of this document.

The impact assessment method applied to the calculation of the analysis results conforms to the applied PCR (EN 15804+A2, EF 3.1). The climate change impact is reported in compliance with

ISO 14067 separately (taxonomy) for fossil and biogenic climate change impact, climate change impact caused by land use change and by aviation, as well as for the sum of the above.

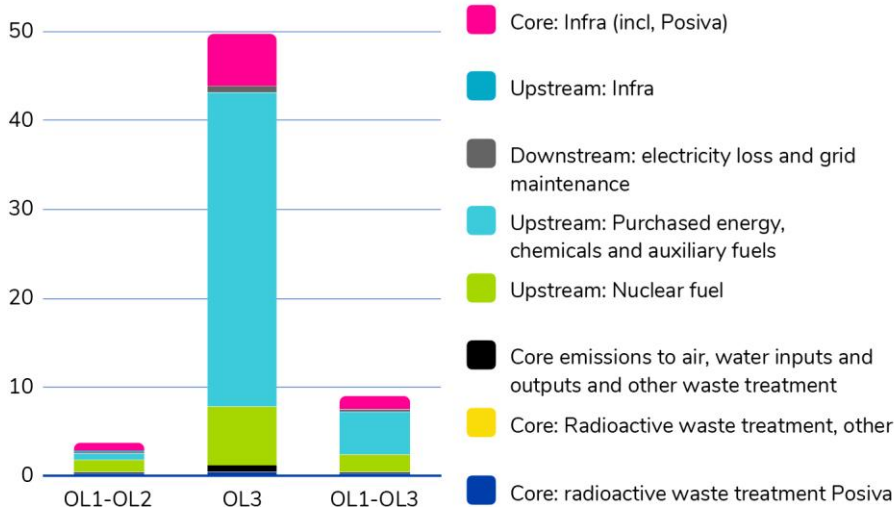
Analysis results

The carbon footprint of the electricity produced at the three nuclear power plant units in Olkiluoto is 9.1 g CO₂ e/kWh, excluding transmission of electricity. The calculation of the carbon footprint covers the entire life cycle of nuclear power from uranium mining to the final disposal of spent nuclear fuel and the decommissioning of plant units. If the transmission of electricity is also included, the carbon footprint is 13.8 g CO₂ e/kWh.

GWP

Total

g CO₂ eq. /kWh



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