



INNOVATION FUND

Driving clean innovative technologies towards the market

EAVORLOOP: The Eavor-Loop first of its kind commercial scale implementation of an innovative closed-loop geothermal technology

The Innovation Fund is 100% funded by the EU Emissions Trading System



Project summary

The Eavor-Loop at Geretsried, Germany will provide clean, dispatchable and baseload energy for district heating and/or power generation. It consists of a large underground radiator buried at 4 500 metres. Operating under a natural thermosiphon requiring no pump and no aquifer, fresh water will circulate through the radiator carrying the heat to surface.

With practically no greenhouse gas (GHG) emissions during operation, Eavor Loop will avoid almost 100% of the emissions compared to the reference scenario. Eavor Loop also is an environmentally benign solution, with no water treatment issues, fracking or earthquake risks: it can be installed virtually anywhere providing the EU with a scalable, secure source of renewable heat and power.

COORDINATOR

Eavor Erdwärme Geretsried GmbH

BENEFICIARIES

Eavor Erdwärme Geretsried GmbH

LOCATION

Germany, Geretsried

SECTOR

Geothermal energy

GHG EMISSION AVOIDANCE

0.4 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT

EUR 91 600 000

RELEVANT COSTS

EUR 169 378 781

ESTIMATED CAPEX

EUR 268 226 164

STARTING DATE

01 October 2022

PLANNED DATE OF ENTRY INTO OPERATION

31 December 2026

Eavor-Loop, the scalable “geothermal anywhere” technology

Geothermal energy provides renewable baseload heat or power. Traditionally this means finding, or artificially creating a hot permeable aquifer. Unfortunately, such conditions are found in less than 10% of the world. The good news is that, not only does Eavor-Loop make geothermal energy possible in the other 90%, but it is also dispatchable, enabling it to provide either baseload energy or blend perfectly with intermittent sources such as solar and wind energy. The project has nearly zero GHG emissions during operations, which leads to about 0.4 million tonnes CO₂eq avoided GHG emissions during the first ten years of operation and over 1.4 million tonnes CO₂eq avoided GHG emissions during the initial 30-year life cycle.

The Project, comprised of four Eavor-Loops, extracts heat from the earth through conduction, with no fluid exchange between the radiator sections and the reservoir: a closed loop. The thermal energy produced by the Eavor-Loops will be converted to electrical energy with a conventional Organic Rankine Cycle (ORC) cycle, and the heat will also be sold directly to a planned district heating network. The total installed capacity is 60 MW of thermal energy or 8.2 MW electric. This innovative system can be scaled massively, enabling cities, regions, and countries to plan strategically to meet climate goals and deliver energy security.

Small footprint but important positive impacts

The Project is in Germany, but its attributes, combined with a small surface footprint, allow the solution to be installed virtually anywhere. By 2030, the market size is expected to be at least 800 000 GWh of energy and an additional 1 000 000 GWh in heating per year. The high level of transferability and scalability will allow Eavor to answer such demand with decarbonized heat and power. Further projects have already been identified across Europe and will be unlocked through the operation of the first Eavor-Loops in Geretsried. When realised, it is estimated that up to 82 million tonnes CO₂eq of GHG emissions avoidance can be achieved. The solution is environmentally benign, with no water treatment issues, fracking or earthquake risks. It will meaningfully contribute to European Climate Policies, such as the European Green Deal, by delivering an emission-free solution and supporting the decarbonising effort in the heating sector on a massive scale, following on the steps of the geothermal systems in Paris and Munich.

The project will generate around 4 000 person-years of direct employment in the Geretsried region over the project's life. The indirect employment and the projected employment from replicated projects will be far greater.