The Innovation Fund is a European Financing programme that stems from the EU ETS, which aims to invest part of the revenues from the European carbon trading scheme to the development of innovative clean energy technologies. The Innovation Fund replaces the NER300. It has a wider scope than its predecessor (with notably a greater focus on energy intensive industries and energy storage) and a larger budget. The Innovation Fund does not restrict any innovative first-of-a-kind technology, provided its demonstration leads to material avoidance of GHG emissions, it has the potential for widespread application or to significantly lower the costs of transitioning towards a low-carbon economy in the covered sectors.

The NER300 awarded funding in the form of grants that had to be repayed should the project fail, which made it an instrument that was not aligned with the economics of deep geothermal projects. The Innovation Fund is likely to continue this model, however, discussions are open as to the possibility to award funds to projects by different means, for instance different types of grants or through financial instruments. The NER300, which may be taken as a reference for the upcoming Innovation Fund, supported several geothermal energy projects.

<table>
<thead>
<tr>
<th>Project name</th>
<th>Location</th>
<th>NER Funding</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOSTRAS</td>
<td>Hurtigheim / Eckbolsheim, Alsace, France</td>
<td>EUR 16.8 million</td>
<td>EGS project. The aim of the GEOSTRAS project is to develop a geothermal heat/cold and power plant providing around 46MW of geothermal energy, from a high temperature geothermal resource (over 150 °C). The heat produced by the geothermal power plant will be injected into the local heat grid of western Strasbourg area.</td>
</tr>
<tr>
<td>Geothermae</td>
<td>Prelog, Medjimurje, Croatia</td>
<td>EUR 14.7 million</td>
<td>Geothermal CHP Project with 18.6 MWe + 75 MWth. The geothermal power plant pumps geothermal brine from 1850-2300 m deep wells. It takes full profit of the energy content of the geothermal brine, consisting of the heat of the water and the combustion of the aquifer gases such as methane dissolved in the same water using an Organic Rankine Cycle (ORC) turbine.</td>
</tr>
<tr>
<td>South Hungarian EGS</td>
<td>Battonya, Hungary</td>
<td>EUR 39.3 million</td>
<td>EGS project, for a geothermal power plant with an ORC turbine with a planned capacity of 8.9 MWe.</td>
</tr>
</tbody>
</table>
None of the geothermal projects that receive NER300 financing have come online yet, but when considering the types of projects funded, the priorities of the programme for geothermal energy are quite clear:

- contributing to increasing the market maturity of innovative geothermal technologies (typically EGS), or to increase the market uptake of geothermal energy in new markets, by financing innovative project at scale.
- Considering the ARENA Commercial Readiness Indicator, the NER300 acts to bring technologies from the CRI2 (Commercial trial, small scale) to CRI3 or CRI4 (Commercial scale up).

This provides perspective as to the type of projects that may benefit from support from the Innovation Fund in the coming decade.

**CHALLENGES OF THE INNOVATION FUND: FUND ALLOCATION**

A major challenge of the Innovation Fund stems from the way funding will be allocated to selected projects. Indeed, as the Innovation fund has a generalist purpose (it is not designed with a specific energy technology in mind) funding allocation mechanisms may not be aligned with the requirements of geothermal energy projects.

A major challenge for geothermal energy projects in the NER300 indeed related to the allocation of funding in the form of grants repayable in case the projects does not perform as initially promised. Considering the economics of geothermal energy projects, highlighted notably in the scope of the GEORISK project, such funding allocation is particularly unsuitable to geothermal project development, as it does not contribute to mitigating the financial risk linked to the innovative nature of the project and the higher geological risk in undeveloped areas.

As the Innovation Fund looks set to propose a greater array of mechanisms to allocate Funding to innovative renewable energy projects supported, there is an opportunity for geothermal energy projects to receive support in a manner that is beneficial in accelerating the progression of technologies toward market maturity.

Funds in the Innovation Fund will be allocated in a technology neutral manner, by considering the contribution of a project (and the potential adoption at scale of the innovative technology demonstrated) in terms of carbon emissions reductions. Further benefits (grid services...) may be considered but will not be the primary decision factor in allocating support.

The fund allocation mechanism may allow up to 40% of the awarded grant to be conditioned to the accomplishment of project milestones (in the case of a geothermal project for instance the completion of the first well) and not only on GHG emission reduction performance.

The support allocated to the Innovation Fund is allocated as follow:

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Grant = 50-75%[(Cost[Innovative Project] - (Cost[Conventional project] + Operational Cash Flow))]
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Projects supported under the Innovation Fund must take place in Countries that are part of the EU ETS. All innovative geothermal technologies are eligible in principle for support in the Innovation Fund without restriction on scale.

**KEY WORDS**

- Key prospect for commercial scale projects of innovative geothermal energy technologies
- Primarily for deep geothermal projects until now, but shallow geothermal projects can now benefit (e.g. UTES)
- Development of new market area for deep geothermal energy
- Possibility for grants to be partly validated by milestones, not only performance, which can mitigate the risk inherent in innovative geothermal projects.

**NEXT STEP:**

Innovation Fund Workshop on Geothermal Energy, Brussels, 23 September 2019