Geothermal energy use on (volcanic) European Islands from a market and policy point of view

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The geologic background in Europe is widespread and various. There are significant undeveloped regions in Europe.
Current Uses, key facts of electricity production

- Total installed capacity at the end of 2019: Electricity production capacity: 3300 MWe,

- 130 geothermal power plants in 10 countries
- Growth rate: 5 – 10%/year
- There are 36 projects under development, and 124 projects in the planning phase

- Types of plants: Flash, Dry Steam, Binary
- Capacity factor: between 49 – 82%
- Key countries: Turkey, Iceland and Italy
- Key operator: Enel Green Power, Italy, 37 power plants

<table>
<thead>
<tr>
<th>Capacity achieved in Europe, MWe</th>
<th>In the year of</th>
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<tbody>
<tr>
<td>1000</td>
<td>1999</td>
</tr>
<tr>
<td>2000</td>
<td>2014</td>
</tr>
<tr>
<td>3000</td>
<td>2018</td>
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Current Uses, key facts of geothermal based district heating-cooling production

- Total installed capacity of geothermal based district heating plants at the end of 2019: **5500 MWth**
- Produced heat, more than **12 GWh**
- Growth: 3 – 9 %/year
- Heating-cooling: more than **327** district heating systems
- 12 – 27 new plants installed per year
- Key countries: Iceland, France, Germany, the Netherlands (6 new plants in 2019 with 100MWt), Hungary

<table>
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<tr>
<th>Heating-cooling project operators</th>
<th>Number of plants</th>
</tr>
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<tbody>
<tr>
<td>Local energy company</td>
<td>86</td>
</tr>
<tr>
<td>Public authority</td>
<td>80</td>
</tr>
<tr>
<td>Smaller private operator</td>
<td>63</td>
</tr>
<tr>
<td>Large private operator</td>
<td>59</td>
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Market – Conclusions – Consistent policy is needed

- The geothermal electricity market is growing, with a sustained development in established markets like Turkey, access to new markets like Croatia and Hungary, and ground-breaking innovations such as Enhanced Geothermal Systems (EGS).

- District heating and cooling has emerged as a cost-effective solution to meet the challenge of decarbonising heating and cooling. On top of the progress in established markets, this renewable solution is picking up also in markets where the use of geothermal district heating and cooling was only marginally developed.

- Ground-source heat pump market hits the milestone of 2 million heat pumps installed in Europe, the undeniable success of Sweden is a powerful example that geothermal heat pumps can be a mainstream solution for heating and cooling.
Energy challenges of EU islands

- **Energy security**: Due to their geographical position and small scale economies, many European islands dependent upon imported fossil fuels for transport, electricity and heating & cooling.

- **Heating & Cooling**: Industry and buildings, both public and residential, require a tailor-made solution.

- **Local economic development**: As small-scale economies that often rely on tourism, European islands need to count on an energy system that ensures sustainable economic growth and providing jobs for local communities.
Geothermal energy goes beyond electricity:
- can be used for space heating and cooling for hotels and other facilities
- greenhouse heating
- underground energy storage
- agriculture drying
- desalination, industrial uses
- snow melting, road de-icing
- balneology.

Geothermal solutions for EU islands
Geothermal solutions for EU islands

- Geothermal projects can offer competitive solutions both for industries and buildings, especially integrating it into the smart thermal grids: innovative district heating & cooling systems can supply urban areas even at lower temperatures and are more efficient for cooling in hot summers - Geothermal energy is able to cover energy needs all year round

- Geothermal is local and creates jobs through ad-hoc industries such as the agro-food industry (greenhouse heating, agro-drying). It also boosts tourism through recreational uses such as for bathing and swimming.
More info:

- EGEC Factsheet on Geothermal in EU islands:

- https://www.egec.org/unlocking-potential-geothermal-energy-islands/
Thank you for your attention!

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