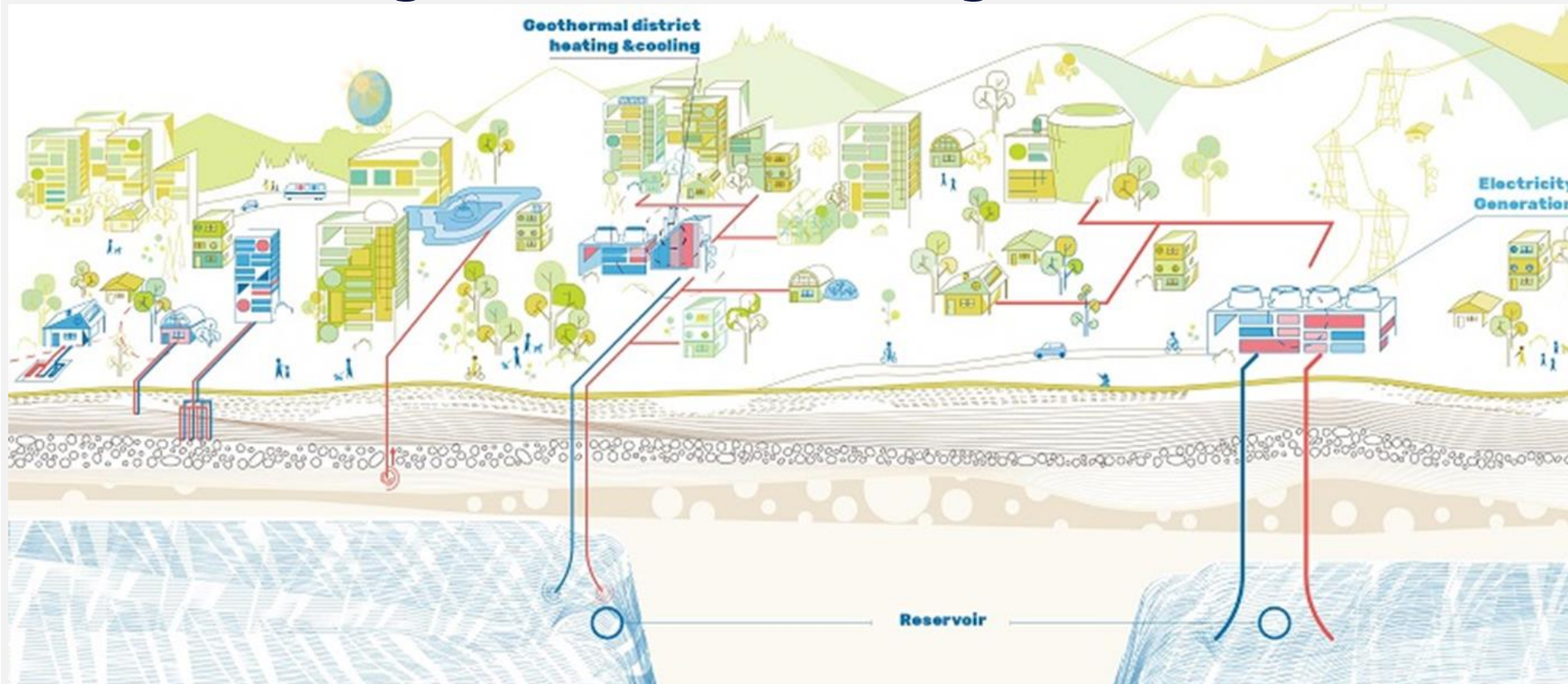


Geothermal energy in the NECPs

EGEC Recommendations – May 2023

Geothermal energy: a unique renewable energy

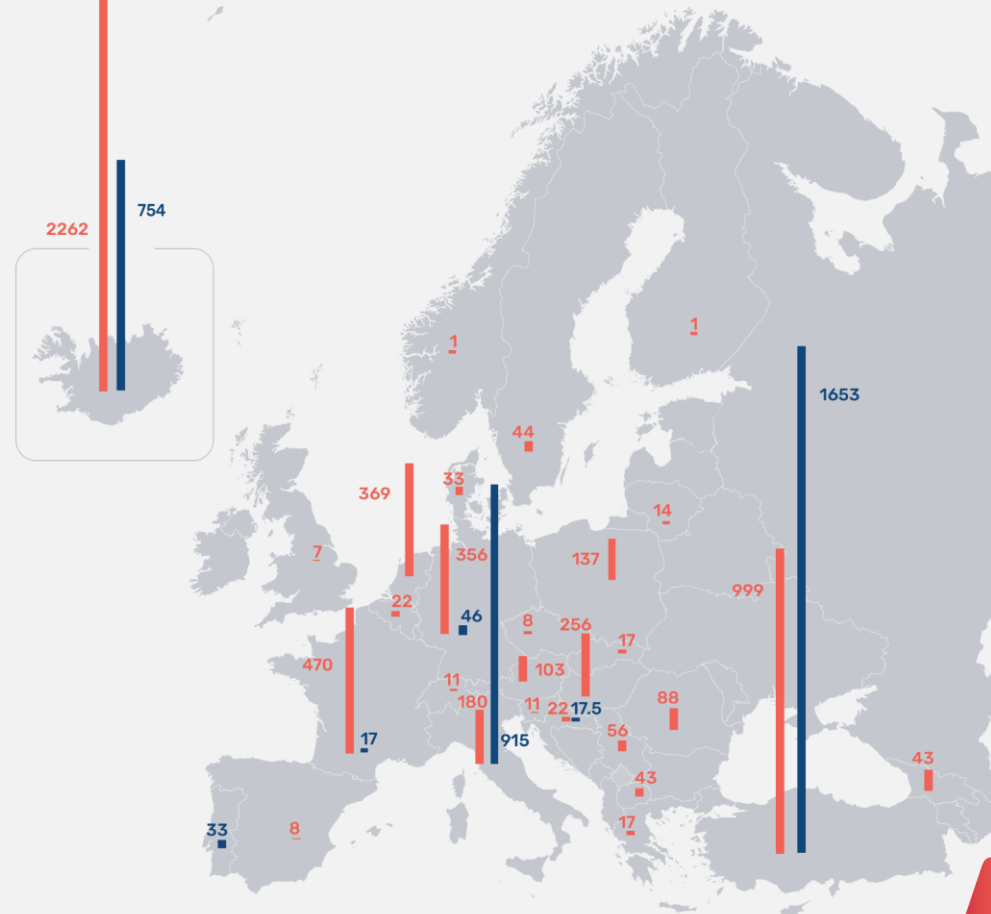
supply electricity, heating & cooling, minerals such as lithium and allow underground thermal storage



Overview

Some key figures

- 142 Geothermal electricity plants: **3,4 Gwe installed** and more than 19 TWh produced
- 380 geothermal DH systems in operation, with **13 new in 2022**: 5,6 GWth capacity
- More than **2 millions geothermal heat pumps** in Europe at the end of 2022, record sales in 2022, esp. very large systems (>10Km boreholes cumulated length)



DEEP GEOTHERMAL FOR HEATING AND COOLING (MW)

ELECTRICITY (MW)



REPowerEU: target for geothermal

Recommendations n°1: NECP must refer to EU target for geothermal

- **Target to triple capacity by 2030 (EU Solar Energy Strategy)**
The [EU Solar Energy Strategy](#), which was launched within the REPowerEU package, **stated a target for the capacity of geothermal to triple by 2030.**
- **REPowerEU Plan (COM(2022) 230 final) set a target to install 10 million high efficiency hydronic heat pumps by 2027 and 30 million from 2020 to 2030. This includes geothermal heat pumps.**

Recommendations:

NECP must refer to these targets by:

- Showing geothermal potential in the country
- Providing statistical data to monitor these targets

Fitfor55: additional targets

Recommendations n°2: NECP must refer to EU target on H&C from RES

➤ Heating & cooling from renewable sources - binding target (RES Directive)

Article 23: the target is split in two – 0.8% increase to 2026, 1.1% for the period 2026-2030. **The binding nature of the target must be reflected in each NECP.**

National Geothermal roadmaps

Recommendations n°3: NECP must mention the need of national geothermal roadmap in each country,

to replicate the existing ones in

- France
- Poland
- Ireland
- Germany

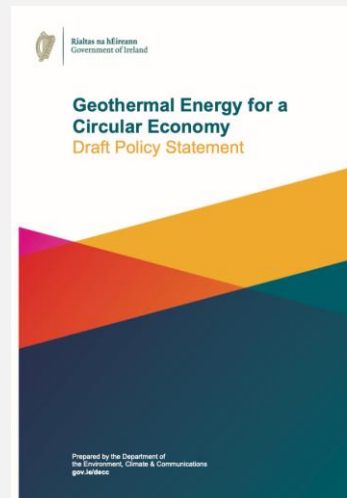


Double Geothermal HP by 2025 & Geothermal DH by 2030



Risk guarantee scheme.

Focus on Geothermal HPs and DHC systems.



Exploration and production licence law by 2024.

600,000 HPs by 2030. Expect half to be geothermal and DHC.



Risk guarantee scheme.

100TWh from 100 new Geothermal HP and Geothermal DHC systems by 2030

RES Directive: new key provisions

Recommendations n°4: NECP must detail the measures to deploy H&C from RES

- **Increase the share of Heating & cooling from renewable sources - binding target (Article 23): e.g.**
 - (e) creation of risk mitigation frameworks to reduce the cost of capital for renewable heat and cooling projects;
 - (f) promotion of heat purchase agreements for corporate and collective small consumers;
- **Mention the key measures for geothermal: Risk mitigation framework, Heat Purchase Agreements (HPAs) etc.**

EPBD: new key provisions

Recommendations n°5: NECP must detail the measures to decarbonize buildings

- **Long-term Renovation Strategies: Member States are required to outline in the NECPs how they will deliver the nearly net-zero buildings.**

EED: new key provisions

Recommendations n°6: NECP must detail the measures on energy efficiency

- **Mandate for local renewable heating and cooling planning (Article 23 par. 6)**
- **Urban areas with a population of 45 000* inhabitants will be required to plan renewable heating and cooling networks.**
 - **This provision has to be detailed and it must be explained how it will be transposed in the NECPs.**

* EED trialogue.

Simplify permitting: implement key provisions

Recommendations n°7: NECP must detail the measures to simplify permitting for geothermal projects

1) “Renewable go-to areas“

- Shorter deadline of 6 months for areas already designated as suitable for an accelerated renewables deployment.
- For renewable go-to areas, permit-granting processes should not take longer than one year for renewables projects.
- These rules must be included in the NECPs from all MS for geothermal heat pumps, district heating and cooling systems as well as for geothermal power plants: reform mining law, licensing process...

2) Fast permitting emergency measures (Council Regulation (EU) 2022/2577)

- Permits granting process for Geothermal Heat Pumps up to 50MWth must not exceed 3 months.
- These rules must be included in the NECPs from all MS for geothermal heat pumps as well as district heating and cooling systems: adopt a traffic light systems, streamline regulations...

Simplify permitting: implement key provisions

1) “renewable go-to areas” (to be included in the RES Directive revision)

On 19 December 2022, the Member States agreed on accelerated permitting rules for renewables:

- ✓ Each EU Country will have to map the areas necessary for national contributions towards the 2030 renewable energy target within 18 months after the entry into force of this directive, and adopt a plan or plans designating 'renewables go-to areas' within 30 months.

Recommendation 7a: Each country must propose a map for geothermal go to areas.

Simplify permitting: implement key provisions

2) Fast permitting emergency measures

A) Replicate best practices: a geothermal traffic light system

e.g. from Germany.

Recommendation 7b: Each country must set a traffic light systems to allow fast permitting in green areas and adopt better regulations for orange and red areas.

B) Refer to new national legislations:

e.g. France: Article L. 122-1 of the French Construction and Housing Code: To promote renewable energy in buildings a technical and economic feasibility study is required for new build and refurbishments which must include an assessment of geothermal energy.

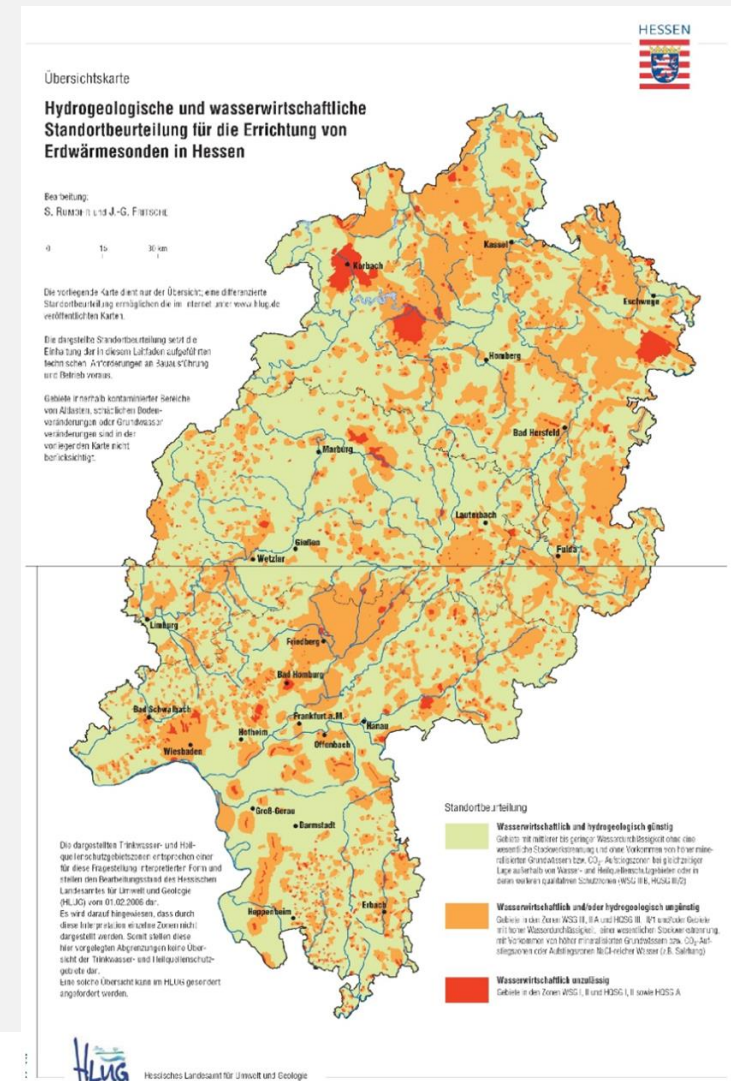
Recommendation 7c: This should be highlighted to all Member States for inclusion in their NECPs.

The Netherlands fossil boiler plan mandates that from 2026 all new heating systems will be hybrid heat pumps. Exceptions to this will be densely populated areas where there will be an option to join a renewable heating network.

Recommendation 7d: This should be promoted to all other Member States.

Traffic light systems for Hessen (Germany):

- Green: just notification
- Orange: autorisation within max 3 months
- Red: further authorisation



Creation of risk mitigation frameworks for renewable heat and cooling projects

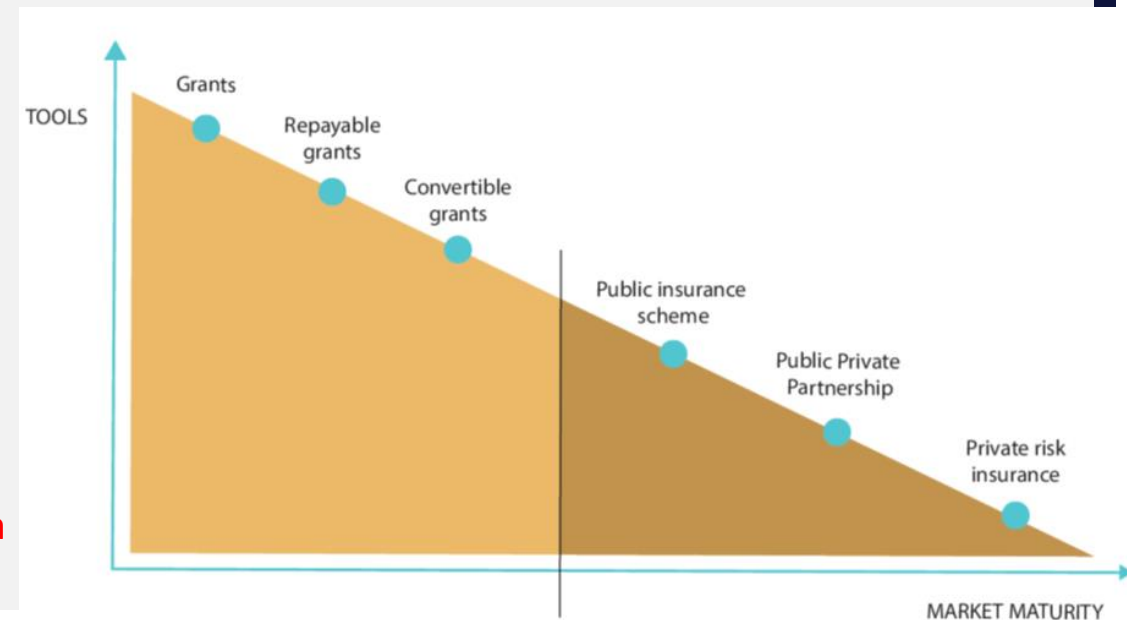
Recommendations n°8: NECP must present the measures to create a de-risking financial instrument for RHC projects

Article 23 of the RES Directive presents this measure to achieve the average annual increase in RHC (Member States shall endeavour to implement at least two of the measures referred in this article):

De-risking instruments can take many forms, depending on the overall maturity of the market. They provide geothermal energy developers with a mean to reduce and manage their exposure to project risk. It is very relevant for small developers and vital for cities developing heat & power projects.

1) Establish a national scheme: e.g.

- **France** has operated a fund since the 1980s, de-risking 60+ projects, with 80% coverage. Important leverage effect and 20y sustainability.
- **The Netherlands** government provides a guarantee scheme (RNES Aardwarmte). It requires a premium payment equal to 7%.
- **Hungary** operates a scheme based on grants to grow the national geothermal market.
- **Recommendation 8a:** Invite Member States to share their best practices on national risk mitigation schemes to replicate them in each country.



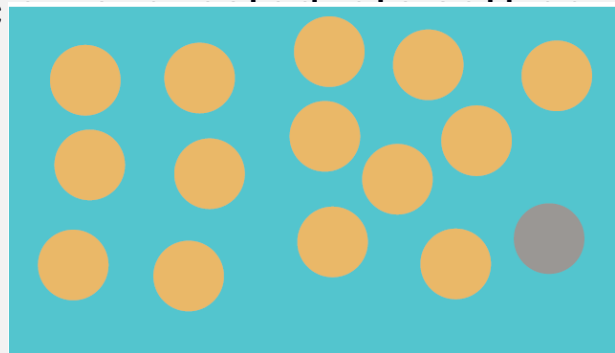
Creation of risk mitigation frameworks for renewable heat and cooling projects

Recommendations n°8: NECP must present the measures to create a de-risking financial instrument for RHC projects

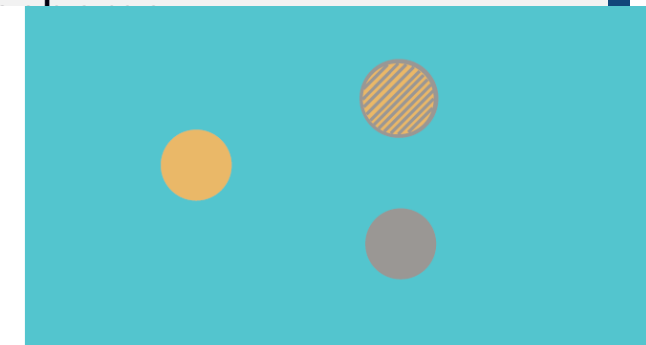
2) Towards a pan European risk mitigation instrument:

- Risk mitigation schemes can be set up at a regional scale, but it is more efficient to pool the risk of more projects. When possible, it is relevant to mutualise the risk over an entire reservoir, as Hungary is promoting in the Pannonian Basin, or even to establish a financing of geothermal de-risking at the European Union level. This allows to reduce the costs for policy makers and developers.
- In France for instance, the geothermal risk mitigation scheme unlocked 42 euros of private geothermal investment for each public

- **Recommendation 8b:** Invite Member States to share their existing national schemes to create a European scheme for countries that are unable to establish one.



Representation of a mature market with 1 failed project



Representation of an emerging one with 1 failed project and on partial failure.

Financing geothermal projects

Recommendations n°9: NECP must present the measures to support financially geothermal projects

Member States should present their funding programs and replicate best practices from other countries.

1) Cohesion Funds for exploration drilling

- **Slovakian Operational Programme (2021-2027)**: the ministry will support exploratory research for geothermal sites to increase geothermal energy's contribution to its Slovak energy mix.

2) RRP funds for geothermal projects

- €25,3 million, 1/8 of all funds provided by the Italian RPP to develop DH networks in Italy, is being dedicated to geothermal district heating networks in Tuscany.

Financing geothermal projects

Recommendations n°9: NECP must present the measures to support financially geothermal projects

Member States should present their funding programs and replicate best practices from other countries.

3) A tendering system that rewards multiple benefits of geothermal (base load, dispatchable, providing underground thermal storage, socio economic benefits...)

- The proposed two-way CfD rules to tender new capacity (EMD: Article 19b) must include non-price services such as system adequacy, reliability, storage and flexibility as well as additional services such as heating, cooling, sustainable lithium or other raw material extraction into strike prices to sufficiently reward and incentivise investment in geothermal capacity.

4) Funding heat infrastructure

- **CEF and TEN-E must now make eligible heat infrastructures.**
- **National Fund: In France**, the purpose of the Heat Fund is to develop renewable heat production facilities and heating networks in collective housing, local authorities and businesses (financing, studies, project management assistance, training, communication and evaluation).
About €600 Million= €370 Million for the Heat Fund + €85 million under the low-carbon heat recovery plan + €150 million under the resilience plan.

Recommendation: TEN-E regulation and CEF must be amended.

National best practices should be promoted to other Member States to accelerate geothermal investments.

A Geothermal skilled workforce

Recommendations n°10: NECP must present their measures on training and certification of the geothermal workforce

Article 18 of RED already asked since 2009 Member States to establish a certification scheme for geothermal installers (esp. drillers)

- Geotraining is the European platform for training

Recommendation: Establish training and certification schemes for geothermal workforce in all Member States and report back in NECPs.

Electricity Market Design

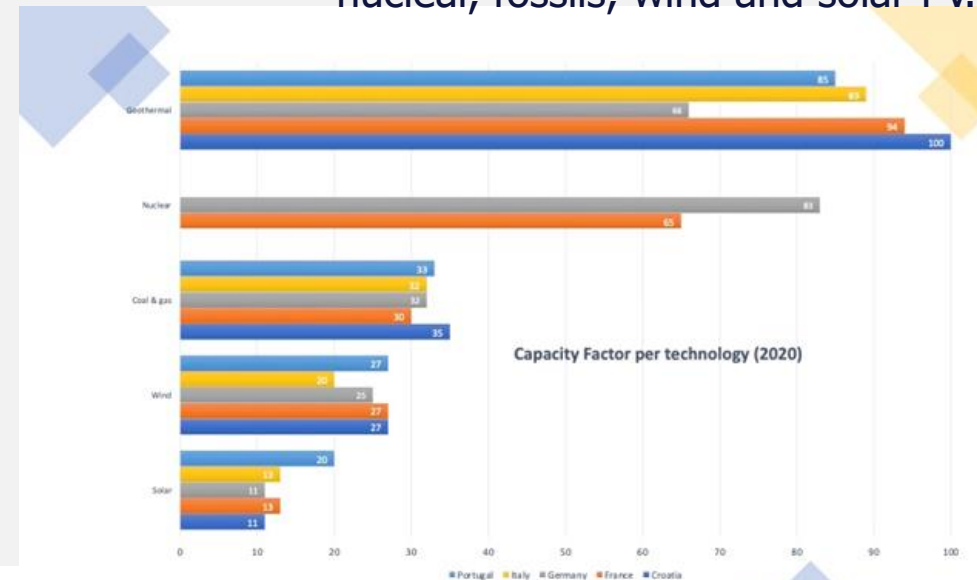
Recommendations n°11: NECP must present their measures to develop geothermal electricity

Geothermal electricity is listed in EMD as one of the 5 main electricity sources mentioned for public subsidies.

Geothermal is also one of the most reliable sources of electricity. This means that each MWe installed produces significant volumes of renewable electricity as well as vital co-benefits such as baseload renewable heating and cooling and the most sustainable extraction of lithium and other minerals.

Recommendation: NECPs must mention a Geothermal electricity action plan to achieve 10% geothermal electricity.

The International Renewable Energy Agency (IRENA) assessed the load factor of geothermal electricity, nuclear, fossils, wind and solar PV.



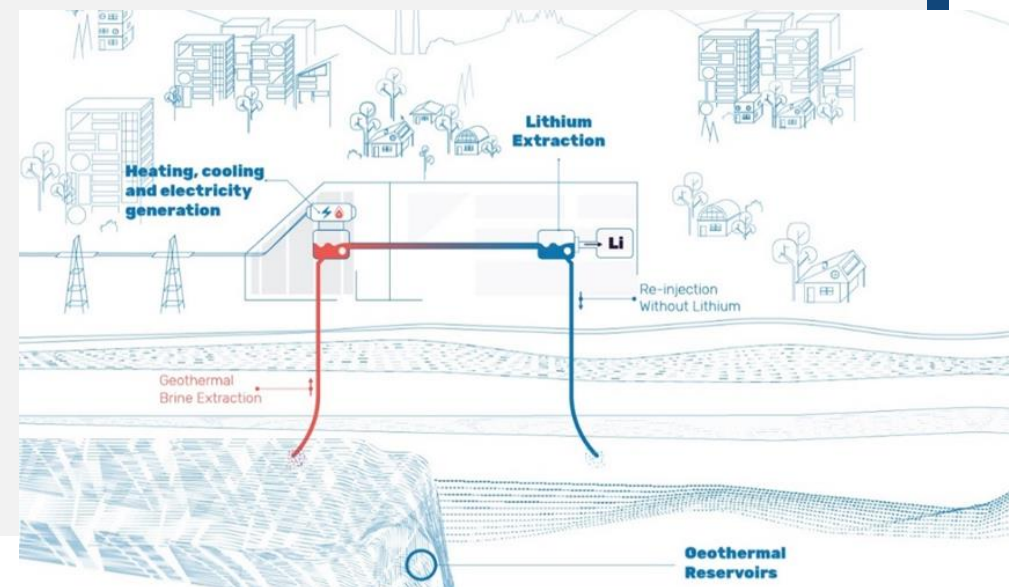
Critical Raw Materials: Geothermal lithium

Recommendations n°12: NECP must present their measures to develop geothermal lithium

- 1) National exploration plans (article 18) must include drilling campaigns to identify new geological and geophysical data of mineral reserves, especially those that benefit from geothermal mineral extraction.
- 2) We recommend funding from the Innovation Fund is used in the interim period prior to a direct funding stream in the Sovereignty Fund is agreed.
- 3) The permitting process for exploration campaigns must be aligned to the timetable outlined in Council Regulation (EU) 2022/2577.

Recommendation: NECPs must mention a Geothermal lithium action plan to achieve 20% geothermal lithium by 2035.

Geothermal lithium refers to the safe extraction of raw lithium (and other minerals) from geothermal energy plants.



Net-Zero Industry Act for geothermal

Recommendations n°13: NECP must present their industrial plan on geothermal technologies

Net-Zero Industry Act proposal sets geothermal as one of the eight strategic net zero technologies. Geothermal is a unique RES generating H&C as well as electricity, providing thermal storage in the underground, and supplying minerals such as lithium.

- 1) Support the full value-chain which includes geothermal equipment and components.
- 2) Auctions to deploy new renewable sources should prioritise investment in technologies that provide multiple services such as dispatchable or baseload renewable electricity, heating and cooling or sustainable critical raw material extraction and seasonal storage.
- 3) Linking training academies to the attainment of the binding commitments for certification and qualifications are outlined in the Renewable Energy Directive Article 18.

Recommendation: NECPs must mention a Geothermal industrial plan.