Council of the European Union

Brussels, 29 November 2024
(OR. en)

16248/24

ENER 581
COMPET 1164
CLIMA 421
ENV 1154

NOTE

From:	General Secretariat of the Council
To:	Permanent Representatives Committee/Council
Subject:	Council conclusions on the promotion of geothermal energy - Approval

1. On 17-18 April 2024, the European Council called for achieving a genuine energy union, by securing the supply of abundant, affordable and clean energy that serves the dual objective of pursuing European energy sovereignty and climate neutrality. This will require ambitious electrification using all net-zero- and low-carbon solutions, flexibility, and substantial deployment of clean technologies and investment in grids, storage and interconnections.

2. On 16 July 2024, the Presidency hosted an informal meeting of energy ministers in Budapest, in which, as the first point, they discussed the role of geothermal energy. The participants agreed that geothermal energy is a critically important alternative and sustainable renewable energy source for both heating and electricity generation and offers a number of as yet unused benefits.

3. On 20 September 2024, the Geothermal Energy Conference, a partner event of the Presidency, took place in Budapest. Over 250 participants from public administration, private sector, and academia discussed the key opportunities and challenges related to geothermal energy, in particular how to develop the sector further in a more accelerated manner.

4. At the meeting of the Working Party on Energy on 25 September, the Presidency held an orientation exchange, based on a discussion paper.

5. The Presidency presented information about the Geothermal Energy Conference to the TTE (Energy) Council on 15 October 2024 (doc. 14031/24). The Presidency also announced that it was working on Conclusions on the promotion of geothermal energy and that it would come back to this subject.

6. The draft Conclusions and their successive revisions were discussed at the Working Party on Energy on 25 October, 12 November and 26 November. The text set out in the annex of this note reflects the result of these discussions and the written comments provided by Member States.

7. In light of the above, the Permanent Representatives Committee is invited to:

   a. confirm its agreement on the text of the draft Council conclusions as set out in the Annex to this note; and

   b. transmit the draft conclusions to the TTE (Energy) Council for approval at its meeting on 16 December 2024.

ANNEX

DRAFT COUNCIL CONCLUSIONS
ON THE PROMOTION OF GEOTHERMAL ENERGY

THE COUNCIL OF THE EUROPEAN UNION,

RECALLING:

- The European Climate Law[1] and its obligation to take the necessary measures at Union and national level, respectively, to enable the collective achievement of climate neutrality by 2050 at the latest;
- The European Council Conclusions[2] of 17-18 April 2024, calling for achieving a genuine energy union, by securing the supply of abundant, affordable and clean energy that serves the dual objective of pursuing European energy sovereignty and climate neutrality. This will require ambitious electrification using all net-zero- and low-carbon solutions, flexibility, and the substantial deployment of clean technologies and investment in grids, storage and interconnections;
- The right of Member States to decide their own energy mix, taking into account their geological, environmental, economic and other specific circumstances, and to choose the most appropriate technologies to achieve collectively the 2030 energy and climate targets;
- The Net Zero Industry Act[3], aiming to ensure the Union's access to a secure and sustainable supply of net-zero technologies, including by scaling up the manufacturing capacity of net-zero technologies and their supply chains; and listing geothermal energy among net-zero technologies;

1 Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999;

2 EUCO 12/24, available at https://www.consilium.europa.eu/en/press/press-releases/2024/04/18/european-council-conclusions-17-and-18-april-2024/

3 REGULATION (EU) 2024/1735 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724; OJ L, 28.6.2024

- The Renewable Energy Directive[4] and, in particular, the obligation for Member States to introduce appropriate measures in their national regulations and building codes and, where applicable, in their support schemes; and furthermore, to increase the share of renewable energy in electricity, in heating and cooling, and in district heating and cooling as well as in industrial processes;
- The Energy Efficiency Directive[5], according to which, Member States shall facilitate the establishment of financing facilities, or the use of existing ones, for energy efficiency improvement measures; and which provides criteria for efficient district heating and cooling systems;
- The Energy Performance of Buildings Directive[6], with geothermal energy as one of the options to cover the energy needs of a zero-emission building;
- The Electricity Market Regulation[7], which lists geothermal energy among the sources for which direct price support schemes for investment in new power-generating facilities for the generation of electricity shall take the form of two-way contracts for difference or equivalent schemes with the same effects; and for which Member States shall promote the uptake of Power Purchase Agreements.

4 Directive (EU) 2023/2413 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652;

5 Directive (EU) 2023/1791 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast)

6 Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

7 Regulation (EU) 2024/1747 of the European Parliament and of the Council amending Regulations (EU) 2019/942 and (EU) 2019/943 as regards improving the Union's electricity market design Art 19.d

TAKING NOTE OF:

- The Commission's Communication on the revised Strategic Energy Technology Plan[8];
- The Commission's Communication on the EU-wide assessment of the draft updated National Energy and Climate Plans[9], which noted that geothermal energy sources are mentioned in several draft plans in various sections, in particular covering heating and cooling, but provide no significant detail on the measures needed to deploy them;
- The Commission's Communication on REPowerEU[10] on reducing dependency on Russian fossil fuels, speeding up the energy transition and the further integration of the energy market;
- The Commission's Communication "EU's Solar Energy Strategy"[11] mentioning that energy demand covered by solar heat and geothermal should at least triple in order to reach the EU 2030 targets;
- The opinion of the Committee of the Regions entitled "On the role of geothermal in localising energy production."[12]

Geothermal opportunities and obstacles to their wider use

1. HIGHLIGHTS
   a. the potential of geothermal energy as a local renewable energy source in terms of providing energy security, sustainability and contributing to affordable energy prices;
   b. that the use of geothermal energy contributes to the strategic objectives of the European Union by decreasing energy dependence and fossil fuel imports, especially concerning heating and cooling while at the same time increasing Europe's open strategic autonomy and the competitiveness of European industries;

8 COM(2023) 634 final
9 COM(2023) 796 final
10 COM(2022) 230 final
11 COM(2022) 221 final
12 Opinion of the European Committee of the Regions – Localising energy production: the role of geothermal energy (Own-initiative opinion); 26.6.2024, C/2024/3663

c. the role of geothermal energy as a mature net-zero technology in the decarbonisation of the energy sectors;

d. that the enhanced development of shallow and deep geothermal energy can lead to significant emissions savings, in particular in the building sector, and can contribute to achieving the EU's ambitious climate and energy targets;

e. that where geothermal energy is locally available, it can provide a stable supply for heating and cooling, as well as energy storage, flexibility and energy system integration services and deliver affordable and predictable energy supply costs;

f. that in regions with high geothermal potential, as well as in regions that are harder to decarbonise, such as the outermost regions, geothermal energy could also provide a stable and predictable supply for dispatchable electricity;

g. the synergies with critical raw materials production, which means that where the chemical composition of geothermal fluids allows, geothermal energy exploration can contribute to meeting the Union's demand for lithium and other raw materials, thereby promoting European mineral sovereignty, while keeping in mind the need to ensure environmental protection.

2. UNDERLINES

a. that on average, more than half of the residential sector's final energy consumption for space and district heating and cooling is currently fuelled by fossil energy resources at Union level, while geothermal energy can provide affordable and secure heating and cooling supply to decarbonise energy consumption in buildings and make industries more competitive and sustainable;

b. that despite the benefits of geothermal energy, there is still important untapped potential for geothermal energy that could be further explored and used;

c. that regulatory complexity, financial and commercial barriers, insufficient human capacity or technology-specific experience in permit-granting authorities and the lack of a skilled workforce and specialised companies are factors contributing to the suboptimal use of the geothermal energy potential;

d. that the lack of data, including subsurface data, and limited public accessibility to existing geological data, have also been identified as hindrances to de-risking at the early stage of project development, and to preventing the more rapid deployment and wider uptake of geothermal energy;

e. that despite the relatively low operating cost, the commercial viability of deep geothermal investments is unlikely to increase without measures to address high upfront investment costs, and risks related to exploration, capital and drilling;

f. that geothermal energy production needs to be in line with the environmental framework, including nature and groundwater protection and safety requirements;

g. that economic, technical and geological feasibility is taken into account when Member States decide on possible geothermal energy promotion measures.

Actions to accelerate the deployment of geothermal energy

3. CALLS ON the Commission to draw up a comprehensive strategy on the decarbonisation of heating and cooling accompanied by a dedicated European Geothermal Action Plan with measures to facilitate geothermal projects and to accelerate the deployment of geothermal energy. Such measures could include:

   a. possible guarantee schemes to mitigate upfront investment risks;

   b. guidance and best practices to enhance investment in geothermal projects and relevant infrastructure, including district heating and cooling networks and storage;

   c. best practices and guidance to accelerate and simplify permit-granting procedures, including the involvement of local communities, and to facilitate the end-to-end delivery of geothermal projects;

   d. actions to tackle the lack of a skilled workforce, to improve capacity throughout the whole value chain for geothermal energy;

e. actions to facilitate data sharing, subsurface data availability and accessibility and new geological data collection;

f. best practices or models to facilitate long-term contracts, such as renewable heating and cooling purchase agreements;

g. the promotion of electricity generation from geothermal energy, where geological potential exists, to support the use of geothermal energy as a stable supply of electricity, including for islands and outermost regions, accompanied by appropriate actions to render geothermal investment competitive.

4. CALLS ON the Commission and the Member States to provide a structured forum, such as a European Geothermal Alliance, to bring together policymakers, industry stakeholders, investors and other relevant stakeholders throughout the entire value chain, to exchange best practices and successful business models, create new partnerships and identify common bottlenecks and remedial actions.

Regulatory framework and financial aspects

5. CALLS on the Member States, in the context of the implementation of the relevant EU acquis:

a. to streamline, if necessary, their respective regulatory procedures affecting geothermal energy production, including for infrastructure, enabling its use, as well as drilling and mining activities-and environmental procedures*;*

b. to accelerate, if necessary, the permit-granting and licensing procedures, and to facilitate-access to information by considering, for example, setting up a single point of contact to inform project promoters;

c. to strive to improve the coordination of geothermal heating, cooling, electricity and energy storage planning and development at regional and national level and encourage municipalities to foster full exploitation of the geothermal energy potential through the whole energy system;

d. to improve transparency in planning and reporting on geothermal energy in the context of the national energy and climate plans and related reporting;

e. to consider geothermal energy solutions in their plans for integrated energy systems in order to balance grids, ensure flexibility and grid stability and reduce emissions;

f. to consider issuing guidance for local authorities, energy and district heating and cooling system operators to take geothermal energy into account during regional or urban planning and when planning local energy infrastructure investments; to take a holistic view of all alternatives; to align such guidance with the comprehensive heating and cooling assessment required by the Energy Efficiency Directive, and with the obligation to mainstream renewable energy in heating and cooling in line with the Renewable Energy Directive;

g. to promote an optimal design of district heating and cooling systems, for example by lowering the temperature at which they can operate, in order to integrate geothermal energy, thus making them more sustainable;

h. to consider geothermal energy solutions in their building codes as a driver for more efficient and sustainable buildings;

i. to encourage the application of an integrated approach to subsurface pore-space activities in order to harmonise geothermal energy usage with the protection of groundwater as well as with other uses of the subsurface pore-space activities such as carbon capture and storage, and hydrogen storage;

j. to facilitate projects reconverting fossil underground facilities to use them for geothermal energy or encourage the development of solutions enabling the faster realisation of such projects;

k. to consider elaborating or, where these already exist, facilitating access to financial or guarantee schemes and incentives to mitigate high upfront costs and risks related to drilling and exploration, to promote the construction of geothermal infrastructure and to facilitate the commercial viability of geothermal investments;

l. where appropriate, to incentivise and issue guidelines to increase the use of geothermal solutions for heating and cooling purposes in general, as well as in district heating and cooling networks and, where relevant, deep geothermal solutions for power production;

m. to consider the potential of all former uses of boreholes or mining activities to harness geothermal energy, decarbonising local, usually fossil-fuelled district heating and cooling networks in order to contribute to a just energy transition.

Access to data, information and raising public awareness

6. CALLS ON the Member States to provide and ensure the availability and accessibility of geoscience data, subsurface information, and maps, including on existing district heating and cooling systems. These are essential to assess geothermal potential and make effective use of data and knowledge, acquired through fossil activities, for geothermal development by creating publicly available datasets, where possible;

7. CALLS ON the Member States, with the support of the Commission, to contribute to the promotion, improvement and broadening of the scope of existing projects on geothermal energy data, including the provision of data on existing heating and cooling networks. This will help to bridge data gaps and establish an EU-wide meta-database connecting national geological data repositories, accessible to all stakeholders across the EU;

8. CALLS ON the Member States, with the support of the Commission, to strengthen cross-border cooperation in research and development through knowledge sharing or joint projects, to ensure the seamless integration of geothermal maps (heat-flow and extension of thermal water reservoirs);

9. CALLS ON Member States to encourage and support local and regional authorities to establish energy communities; to cooperate with investors, developers and consumers involved in geothermal projects related to geothermal energy on the basis of an assessment of geothermal potential, the locally available heat market, and the potential to develop community-owned district heating and cooling;

10. CALLS ON the Commission to outline available EU financial instruments and support including, as appropriate, InvestEU and other instruments available through the European Investment Bank (EIB) that can inform project promoters, both in relation to national and cross-border geothermal initiatives;
11. CALLS ON the Commission and the Member States to build upon and support mapping exercises at EU and national level, where relevant, to assess the full potential of geothermal energy across all Member States, with particular emphasis on deep and ultra-deep subsurface geothermal resources, including the use of hydrocarbon extraction data;
12. CALLS ON the Member States to work on raising public awareness and encourage public acceptance, to launch information campaigns and improve knowledge about the social economic and climate benefits of geothermal energy use and about successful case studies, as well as to ensure the inclusion of local governments, rural communities, outermost regions, citizens, renewable energy communities, and other stakeholders in geothermal development activities. In this regard, the Commission should facilitate the efforts towards public acceptance, also make use of different networks of local authorities, such as the Covenant of Mayors;
13. CALLS ON the Member States, with the support of the Commission, to improve knowledge about and the sharing of best practices on potential geological and environmental risks induced by deep geothermal operations, such as induced seismicity, and on prevention, monitoring and, when required, on mitigation measures.

Reinforce workforce, research, development and innovation

14. CALLS ON the Member States to launch re-training programmes in vocational education to meet the specific labour requirements of the emerging geothermal industry. These need to consider the involvement and reskilling of workers and professionals from the fossil fuel and mining industry with expertise in exploration, drilling and piping. This can ensure a just transition that maximises employment opportunities in the geothermal sector;
15. ENCOURAGES the Member States to launch higher education specialisations to provide the geothermal industry with a skilled workforce;

16. ENCOURAGES the Commission and the Member States to include or to further increase the presence of geothermal projects in research, development and innovation programmes and policies, such as Horizon Europe, the Innovation Fund, and the SET-Plan, including its Deep Geothermal Implementation Plan;
17. ENCOURAGES the emergence of new innovative technologies in the field of geothermal energy, contributing to the Union's competitiveness and resilience.

Value chain development and international cooperation

18. ENCOURAGES the Commission and the Member States to step up joint efforts to increase the capacity of qualified European industrial service providers in areas such as drilling, construction and equipment manufacturing;
19. CALLS ON the Commission and Member States to strengthen the Union's position in the geothermal value chain, in all categories: planning, installation, operation and maintenance;
20. CALLS ON the Commission and the Member States to enhance international cooperation with, amongst others, the International Energy Agency, the International Renewable Energy Agency and the Global Geothermal Alliance, in the area of technology, research, development and innovation; to enhance know-how transfer, data collection and policies related to the economic and environmental aspects of geothermal energy; and to promote the sharing of best practices.