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| C:\Users\mreg\Music\New LOGO\Logo\logo_CoR-vertical-positive-en-quadri_MR.jpg**EN** |  |
| **ENVE-VII/043** |
| **160th CoR plenary session, 17 April-18 April 2024** |

**OPINION**

**Localising energy production: the role of geothermal energy**



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| THE EUROPEAN COMMITTEE OF THE REGIONS* underlines that local energy has significant potential in terms of providing energy security, increasing the share of renewable energy and securing affordable energy prices, thereby resulting in greater energy independence for local and regional authorities (LRAs). The European Committee of the Regions (CoR) highlights the untapped potential of geothermal energy, which can directly contribute to all the above key policy objectives for Europe;
* points out that this opinion draws attention to geothermal energy, which is an energy source that can provide benefits as well as meet the requirements for localising energy production in Europe;
* considers that a locally produced, renewable energy like geothermal could play a considerable role in making LRAs more resilient while making the EU more energy independent, energy secure and contributing to decarbonisation goals. Geothermal energy has direct benefits for local communities and economies that would benefit from an EU-wide strategy;
* notes that despite using mature technologies to explore it, geothermal energy is still relatively expensive in many cases, and requires measures to increase capacity, public support and transparency. These include speeding up the permitting and licencing process of local energy generation to scale up and be price-competitive;
* highlights that policy intervention is especially relevant for large-scale geothermal energy investments, which can be of considerable cost, and which can have a significant environmental footprint if not handled properly;
* emphasises the crucial role of citizens participation in decentralising energy production, fostering active involvement to bolster the green transition. This active engagement does not only strengthen the connection between production and consumption, but also promotes the development of a local value chain;
* encourages the establishment of geothermal energy-based heating, cooling and electricity generation as part of renewable energy communities. This would also contribute to the wider uptake of smart metering locally. Similarly, it would create public awareness about LRAs as producers and consumers (prosumers) of locally available energy.
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| RapporteurJózsef Ribányi (HU/ECR), Member of a Regional Assembly: County Council of Tolna MegyeReference documentOwn-initiative opinion |

**Opinion of the European Committee of the Regions – Localising energy production: the role of geothermal energy**

1. **POLICY RECOMMENDATIONS**

THE EUROPEAN COMMITTEE OF THE REGIONS

# underlines that local energy has significant potential in terms of providing energy security, increasing the share of renewable energy and securing affordable energy prices, thereby resulting in greater energy independence for local and regional authorities (LRAs). In this context, the European Committee of the Regions (CoR) highlights the untapped potential of geothermal energy, which is local and clean;

# acknowledges that it is crucial to empower cities and regions to deliver on the European Union targets for clean and renewable energy and energy efficiency as outlined in the COP28 Declaration, Fit for 55 Package, EU Solar Strategy, REPowerEU and the Green Deal;

# points out that this opinion draws attention to geothermal energy, which is an energy source that can provide benefits as well as meet the requirements for localising energy production in Europe;

# considers that a locally produced, renewable energy like geothermal could play a considerable role in making LRAs more resilient while making the EU more energy independent, energy secure and contributing to decarbonisation goals. Geothermal energy has direct benefits for local communities and economies that would benefit from an EU-wide strategy;

# notes that the potential of geothermal energy is discussed in various European institutions such as at the Committee on Industry, Research and Energy at the European Parliament in its *Report on geothermal energy* (2023/2111(INI)). This opinion draws elements from and follows up on relevant CoR opinions[[1]](#footnote-1);

# supports mechanisms for developing municipally-owned renewable heating and cooling and other energy generation systems based on locally available renewable energy sources;

# notes that despite using mature technologies to explore it, geothermal energy is still relatively expensive in many cases, and requires measures to increase capacity, public support and transparency. These include speeding up the permitting and licencing process of local energy generation to scale up and be price-competitive;

# highlights that policy intervention is especially relevant for large-scale geothermal energy investments, which can be of considerable cost, and which can have a significant environmental footprint if not handled properly;

# notes that existing and novel technical assistance and financial instruments already at the disposal of LRAs need to support local energy surveying, planning and production activities. This applies to all local energy production, but is particularly pertinent in the case of geothermal energy;

# insists that best practices and research findings at European, national and regional levels in the field of local and regional energy production need to be disseminated, stressing the social and economic benefits of localised energy production;

# supports the use of this own-initiative opinion and the supporting technical analysis for the wider uptake, exploitation and use of geothermal energy by LRAs in the EU and the broader EU neighbourhood;

# draws attention to the potential of geothermal energy as a key contributor to the journey towards climate neutrality. Despite its associated costs, geothermal energy is notable for its low emissions and the potential to consistently reuse the water generated in the process. To increase effectiveness, it is necessary to support the combined geothermal solutions, i.e. use of thermal water exploitation and heat pumps, and not to inject the spent geothermal fluids to the subsurface above a minimum water temperature threshold set;

# underlines that local energy matters. It has significant potential in terms of enhancing energy security, increasing the share of renewable energy, while also offering affordable energy prices and resulting in a higher level of energy independence for LRAs. In this context, the CoR highlights the untapped potential of local, clean geothermal energy.

*Energy challenges for Europe and geothermal energy's answers*

# emphasises that geothermal energy production at local level supported by LRAs contributes to solving Europe's energy challenges in terms of resilience, energy security, decarbonisation and flexibility via generic energy storage;

# supports the call of LRAs to further scale up geothermal energy in local energy production. This would use local potential and local competitive advantages, support local economies and local jobs and develop local value chains matching local demand with local energy supply. In this regard, there is a need to develop relevant business models, including municipally-led energy communities, district heating and cooling companies, partnerships with local energy service companies, end users, financial institutions and research centres;

# notes the urgent need in the EU and globally to decrease energy prices, develop innovative technologies and strengthen market uptake of renewable energy solutions. In this regard, geothermal energy in the heating-cooling and electricity sectors is identified as a technologically mature, locally available, exploitable and controllable renewable energy source;

# highlights that several LRAs testify that geothermal energy has significant untapped potential for European regions and municipalities;

# emphasises that local geothermal energy production could be further developed, and scaled up where it already exists, through the provision of suitable public guarantees and financial credit lines for geothermal heating and cooling, and electricity infrastructure development;

# refers to the current geopolitical situation, which continues to drive up the prices of fossil fuels and at the same time places fossil fuel infrastructure under threat of attack (sabotage), and the need to transition away from fossil fuels to fulfil the goals set by the European Climate Law and worldwide pledges towards achieving climate neutrality. New market opportunities in the geothermal energy-based heating and cooling and electricity sector need to be explored at different LRA levels.

*Local and regional dimension of geothermal energy*

# acknowledges the strong local and regional relevance of geothermal energy, which is heat generated within the earth's crust. It is used mainly for heating and district heating, electricity generation and industrial processes. Several geothermal technologies exist, at different levels of maturity. Heat is usually extracted from the ground using heat pumps or geothermal wells, ranging from small buildings and shallow, low-temperature ground heat to large-scale installations, deep geothermal sources and high temperatures. What options are technically and economically viable depends, among other things, on the various geological and geothermal conditions. Exploring ground heat is one of the most dynamically developing versions of geothermal heat utilisation. Electricity generation uses the heat stored underground, converting it to electrical power by steam technologies. Some of the quoted technologies are suitable for the extraction of rare earth metals present in geothermal waters;

# recognises that geothermal energy is the only renewable energy source that cannot be derived from solar energy. Solar energy, wind energy, tidal energy and biomass are all formed through the energy source coming from the sun to the earth. Geothermal energy is the only energy that originates from the heat of the earth. At the same time, these two types of renewable energy could be combined to increase efficiency. For example, there are applications that combine geothermal with solar energy stored in boreholes between seasons;

# notes that from the point of view of LRAs, geothermal energy is a renewable, clean, local energy source without a significant environmental footprint, when planned, built and implemented correctly. The green transition entails substantial upfront costs that not all regions and cities can afford without some policy and public finance leverage. This intervention is key to ensure a fair, just and inclusive transition for all regions and cities. At the same time, due to its attributes, geothermal energy represents a viable option for many regions and cities and can play a key role in supporting the EU's transition in a just and inclusive manner. In this context it is noted that geothermal energy exploration can involve the use of decommissioned fossil fuel facilities such as coal mines, which can be positive for local communities and economies in these regions;

# highlights that the lack of data is a significant challenge for municipalities that should have access to different types of geological and subsurface data to be able to evaluate applications and issue building permits for geothermal facilities. A lack of data hinders efforts to reduce local emissions, decarbonise the energy system and ensure affordable renewable energy for all. Access to geothermal data also facilitates the preparation of local building regulations and spatial plans of municipalities. Therefore, local geothermal endowments can be more strongly considered when granting construction permits in a given area;

# urges information sharing to motivate LRAs to use geothermal water at its different temperatures. Public and private buildings falling under the administrative responsibility of LRAs are also concerned in the cascade use of geothermal energy. Cascade use means different ways of utilising geothermal water from high to low temperature. High temperature waters are primarily for residential buildings, municipal district heating grids, colder temperatures for municipally-owned healthcare and wellness facilities and tourism, and finally low temperature levels are for the agricultural and aquaculture sectors. Similarly, where higher temperature geothermal deposits exist, the potential for industrial use of geothermal energy could be explored by fuelling local electricity and industrial heating and cooling needs;

# notes that the contribution of geothermal energy to local jobs should not be underestimated. Staffing of local geothermal power plants, including geothermal engineers and experts to support planning, delivery and maintenance of geothermal infrastructures provide for good employment opportunities, especially in rural areas. Where necessary, re-skilling programmes for workers should facilitate local geothermal energy production. It is also noteworthy that the expertise needed for geothermal energy exploration could be drawn from oil and gas production. It is therefore an ideal transition for this type of highly-skilled workforce;

# refers to trade unions, alliances or umbrella organisations and thinktanks of LRAs that can provide tailored geothermal energy information. This concerns permitting, technology, finance and geothermal application questions;

# highlights that from a technological perspective, it is a requirement that local soil and water, groundwater endowments should not be under threat when planning and delivering geothermal projects. Where it is not already in place, effective legislation and protective measures must be developed to specifically address the safeguarding of water and soil quality, especially in considering the shallow, low temperature geothermal potential that is widely available in Europe. The proper, environmentally friendly technology for investment and exploitation of this potential is already available, and upfront costs of exploitation are affordable;

# requests further financial assistance and support in developing the appropriate capacity to tap into the potential of local geothermal energy production. Initial costs of feasibility studies, analysis of specific locations for projects and test drillings can be too high for municipalities and regions to examine, thus hindering the instigation of geothermal energy projects. For such cases, financial mechanisms such as government loan guarantee schemes to support publicly owned companies can be a beneficial tool, to promote local geothermal energy and ease the financial barriers faced by local and regional authorities in the earliest stages of project development. Existing legislation on this subject needs to be fit for implementation and support the just transition.

*Geothermal energy is strategically relevant in the energy mix of LRAs*

# recognises that geothermal energy production provides for dispatchable renewable heating, cooling and electricity generation;

# notes that the current geopolitical context demonstrates and continues to reaffirm the importance of place-based renewable energy resources such as geothermal energy;

# refers to the need to identify best practices in regulations and business models for different circumstances and applications of geothermal energy, to support geothermal investments and grid (pipeline) system development, operation and maintenance at local level. In this context geothermal energy could provide competitive advantages for LRAs when it comes to defining their own energy mix;

# underlines that delivering concrete recommendations for ensuring the smooth implementation of REPowerEU is necessary. Such advice can also help speed up the energy transition, with a view to accelerating the transition of LRAs to renewable, secure and affordable energy by wider uptake of the use of geothermal energy;

# highlights that at local and regional level, energy communities represent a chance to establish a sustainable, decentralised and democratic energy transition with the active participation of LRAs. Such energy communities should be bottom-up, open and democratic organisational forms with voluntary membership. Based on the amended Renewable Energy Directive (RED II), renewable energy communities could exploit locally available renewable resources (including geothermal energy) in the form of the most appropriate legal entity (e.g. municipally-owned, cooperatives, not-for-profit, limited liability companies, special purpose companies) that best fits the local energy needs and context;

# emphasises the crucial role of citizens participation in decentralising energy production, fostering active involvement to bolster the green transition. This active engagement does not only strengthen the connection between production and consumption, but also promotes the development of a local value chain;

# encourages the establishment of geothermal energy-based heating, cooling and electricity generation as part of renewable energy communities. This would also contribute to the wider uptake of smart metering locally. Similarly, it would create public awareness about LRAs as producers and consumers (prosumers) of locally available energy;

# notes that although LRAs could act as genuine energy communities utilising geothermal energy, such communities are long-term activities. Solid business cases are needed to cover the capital expenditures in the beginning of the investment. Therefore, trust among LRAs, energy community members and energy service companies is very important;

# acknowledges the contribution of geothermal energy to reaching LRAs' net zero goals. Practical ways of delivery are carbon-neutral heating and cooling, and the stable and reliable baseload power provided by geothermal power plants. Decentralised energy systems of geothermal infrastructures reduce transmission losses and improve local air quality by not relying on burning fossil fuels for heating and cooling, which has direct public health benefits, while also contributing to a cleaner and healthier environment.

Brussels, 17 April 2024

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| The Presidentof the European Committee of the RegionsVasco Alves Cordeiro  |  |
|  | The Secretary-Generalof the European Committee of the RegionsPetr Blížkovský  |

1. **PROCEDURE**

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| **Title** | Localising energy production: the role of geothermal energy |
| **Reference(s)**  | N/A |
| **Legal basis** | Own-initiative, Art. 307, 4th paragraph |
| **Procedural basis** | Art. 41 (b) (ii) |
| **Date of Council/EP referral/Date of Commission letter** | N/A |
| **Date of Bureau/President's decision** | 9/10/2023 |
| **Commission responsible** | ENVE-VII-7th Mandate-Commission for the Environment, Climate Change and Energy (ENVE) |
| **Rapporteur** | József RIBÁNYI (HU/ECR)Member of a Regional Assembly: County Council of Tolna Megye |
| **Discussed in commission** | 22/11/2023 |
| **Date adopted by commission**  | 08/2/2024 |
| **Result of the vote in commission (majority, unanimity)** | Unanimity |
| **Date adopted in plenary**  | 17/4/2024 |
| **Previous Committee opinions**  | N/A |
| **Subsidiarity reference** | N/A |

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1. *Amending the Renewable Energy Directive to meet the new 2030 climate targets* (ENVE-VII/023, 2022), *A multilevel governance for the Green Deal: towards the revision of the Governance Regulation* (ENVE-VII/039, 2023) (ENVE-VII/037, 2023) and the *Just and Sustainable Transition in the context of the coal and energy intensive regions* (COTER-VII/24, 2022). [↑](#footnote-ref-1)