



Growing
ideas
through
networks

The COST Action “Geothermal DHC” in a Nutshell

2nd European Underground Energy Storage Workshop, Paris

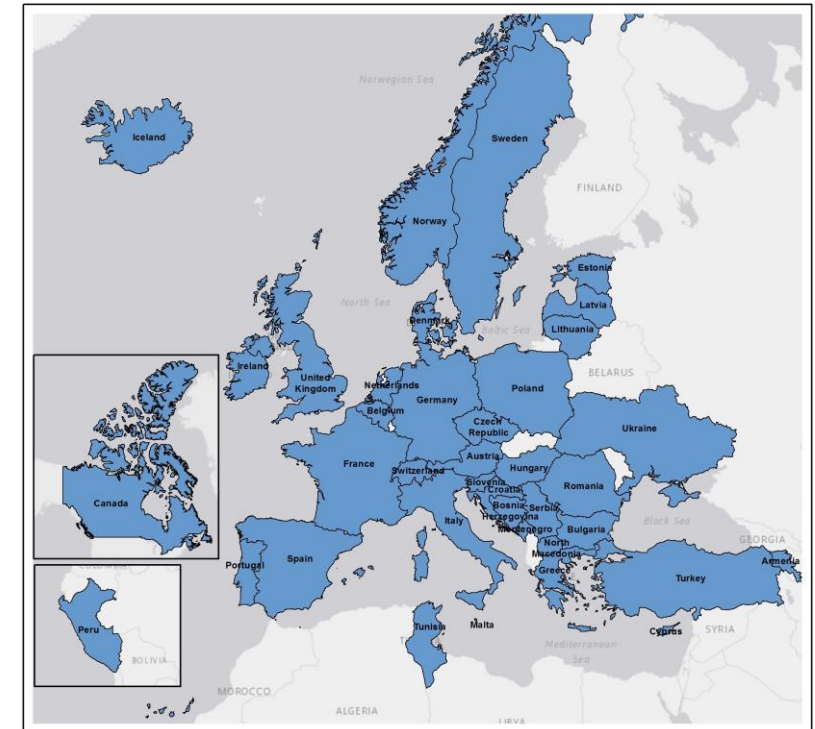
Jessica Maria Chicco (MC Member of the CA18219), University of Torino (Italy)



The COST Action 'CA18219 Geothermal-DHC

„Research network on the integration of geothermal energy in decarbonized heating and cooling networks”

- Operating period November 2019 – April 2024
- Currently ~190 researchers from more than 40 countries
- Open access network – financial support for traveling, dissemination and organizing events
- Chairs: **Gregor Goetzl (Austria), Dejan Milenic (Serbia)**
- **ExCO members: Gregor Goetzl, Dejan Milenic, Giuseppe Mandrone, Jessica Maria Chicco, Vasiliki Gemeni, Edith Haslinger, Nina Rman, Rao Martand Singh, Ana Vranjes, Kai Zosseder**



CA18219 participating countries

COST Actions are not projects!

- COST funds research networks across Europe – **everybody can join**
- **No staff costs paid!**
- No work packages – democratic and flexible work structures (working groups) – **bottom up principle**
- No fixed budget – each Grant Period receives funds according to network size and structure

What does Geothermal-DHC offer

- Webinars, online trainings, in person training schools
- Various grants: e.g. Short Term Scientific Missions, publication support, virtual mobility grants, conference grants etc.
- Expanding your network
- Repositories, fact sheets, web portal
- Interlink between science – industry – communities in a European network
- Joint initiatives and uptakes



PWG1 - Technology



PWG2 – Outreach & communication



PWG3 – Promoting young careers



PWG4 – Uptakes and capitalization

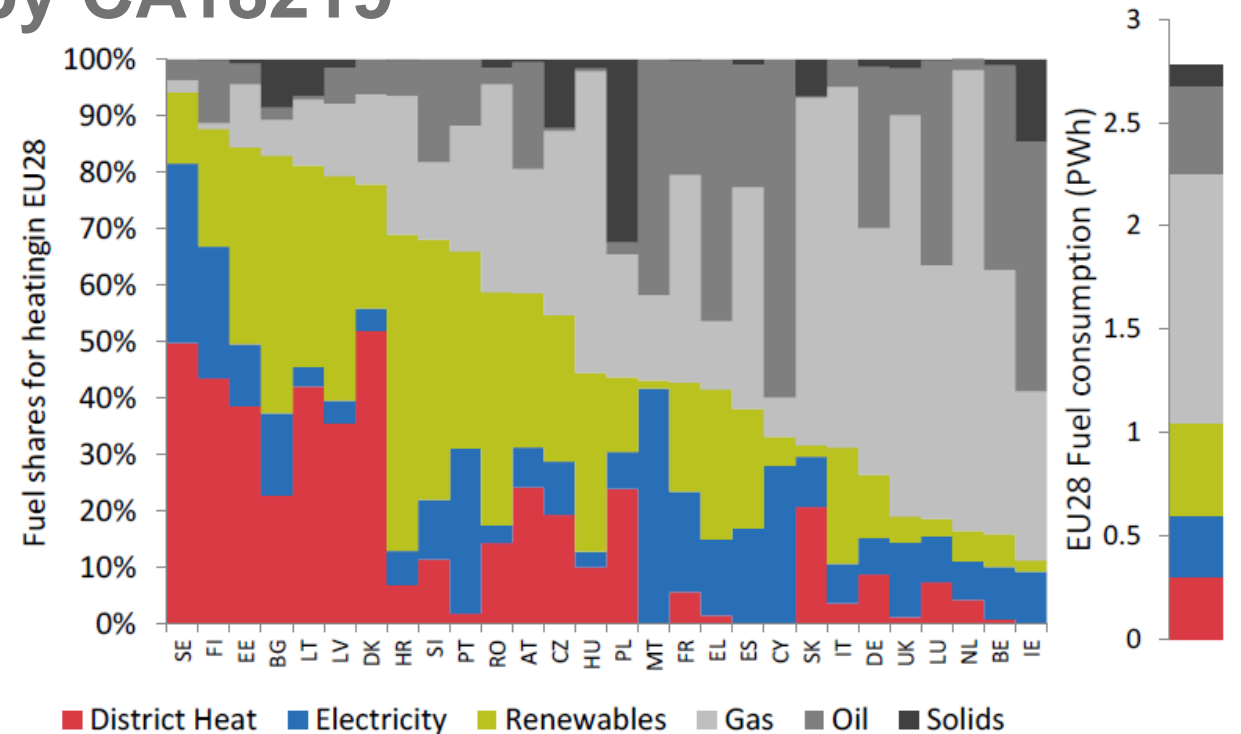


Main challenged addressed by CA18219

Integrate geothermal technologies at different scales and temperature levels into decarbonized district heating and cooling grids.

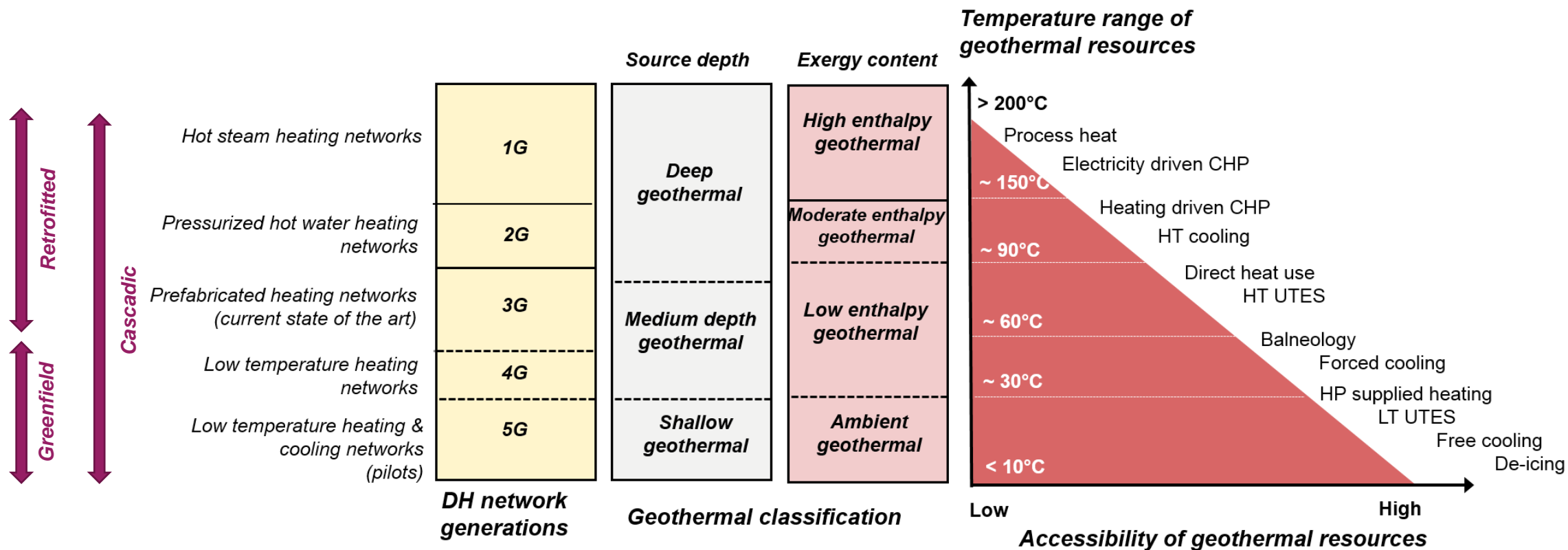
*Geothermal DHC applies an **inter-sectoral and technological bottom-up approach** based on different **case studies across Europe**, instead of just tackling individual technical concepts, technologies or fields of applications*

- **Greenfield solutions**
- **Solutions for retrofitted HC networks**



Fuel consumption for space heating in the EU in 2015
Source: Kavvadias et al. 2019

There are many ways to integrate geothermal in HC networks



Positioning the current status

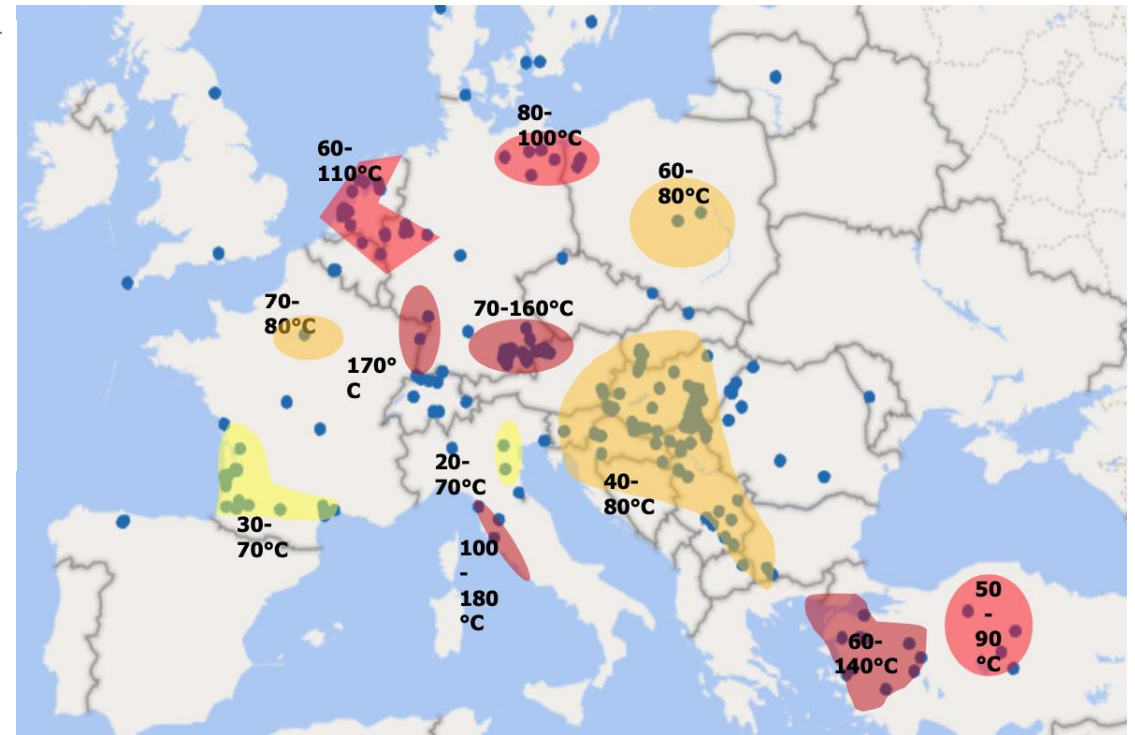
The role of geothermal heating and cooling networks in Europe

Table 1: Statistical KPIs of direct geothermal energy used in heating networks in Europe as for 2019 based on the EGEC Geothermal Market report 2020 (data source: European Geothermal Energy Council).

KPI	Sample Size	P50	P75
Installed capacity (MW)	341	7	14
Temperature of production well (°C)	179	72	80
Capacity factor (gross heat / installed capacity (kh/yr)	234	2,59	3,98

Source: Goetzl et al., 2022b

- **364 direct use geothermal DH networks in Europe ~ 5.6 GW capacity**
- **Approx. >100 5G networks in Europe linked to geothermal technologies**



Source: EGEC Geothermal Market Report 2021

What Geothermal-DHC wants to deliver

Dedicated web portal

Knowledge and networking hub, increased visibility of technological options

Compiled knowledge

Fact sheets on technological and non-technological aspects linked to knowledge repositories

Strategies and policy input

Roadmaps to foster the deployment of geothermal HC networks in Europe

Educating young researchers

Training and educational concepts for the next generation of experts and decision makers

Promoting geothermal in HC networks

Providing easy digestible material to bring geothermal closer to the people




We might not solve everything but we want to set corner stones to be picked up!

SAPHEA – a follow up of the COST Action

€ HORIZON-CL5-2021-D3-02-03

 October 2022 – June 2025



 Develop a pan-European market hub to reduce market barriers for deploying geothermal heating and cooling networks

New EU project SAPHEA

Developing a single access point for the market uptake of geothermal energy use in multivalent heating and cooling networks across Europe

- Funded by HORIZON-CL5-2021-D3-02-03
- October 2022 until June 2025

Relevant market barriers towards geothermal HC networks (drafting of the proposal)

Limited access to information on geothermal resources

Lack of early stage planning and decision making support tools

Lack of risk mitigation measures related to financing and environmental impact

Lack of appropriate business and financing models

Limited visibility of already realized demo cases

Lack of awareness and political support

How SAPHEA wants to respond (project objectives)

O1-Establishing a digital access point for decision-making support, consultancy and building up a network

O2-Adapting and upgrading existing datasets, methodologies and tools towards better integration of geoHC networks in early-stage investment decisions and strategic planning

O3-Contributing to the development of a supportive market framework to facilitate future investments into geoHC networks

O4-Bringing geoHC networks closer to regional stakeholders by considering the different geographical and socio-economic landscapes in Europe

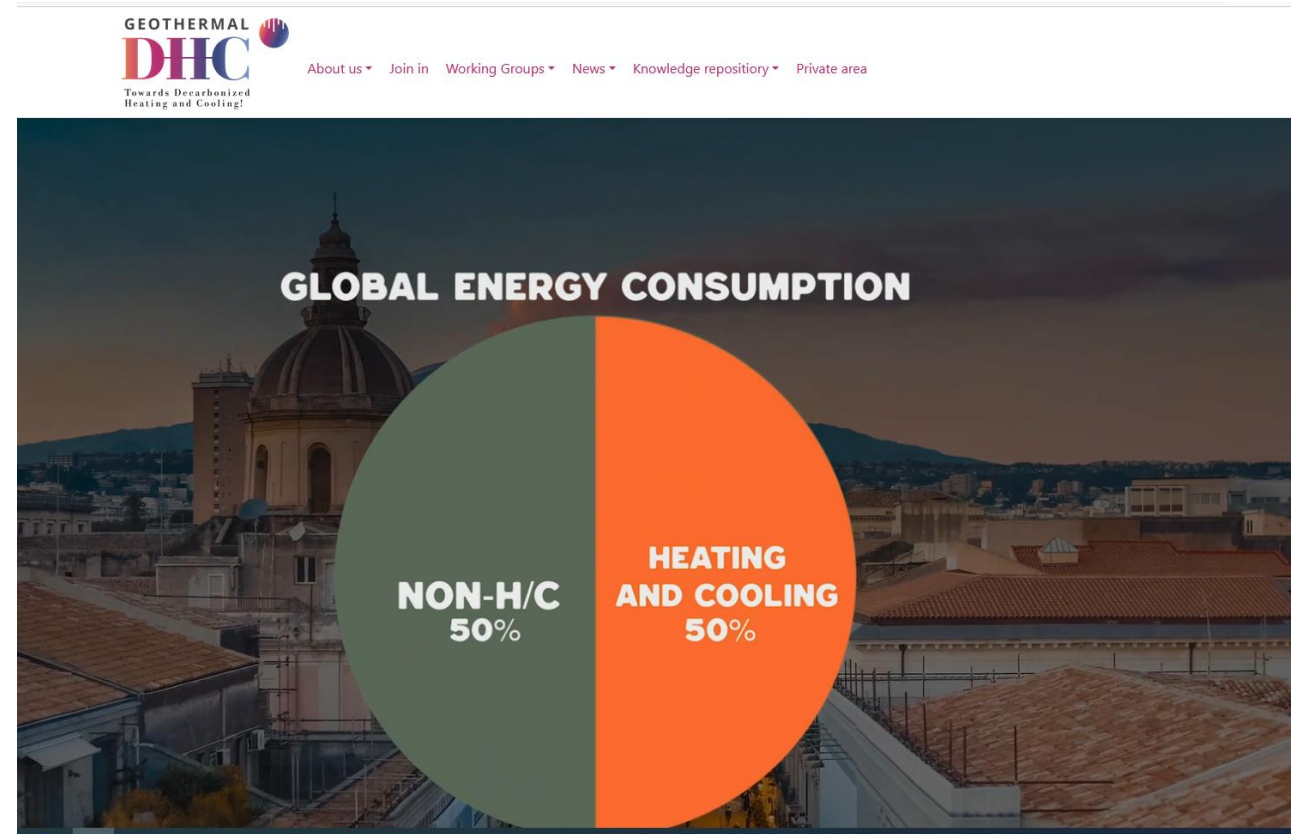
O5-Empowering future investors and operators of geoHC networks



The Geothermal-DHC portal

The future hub for geothermal energy in heating and cooling networks

- **Interlinking:** Yellow Pages, forums
- **Repositories & materials:** publications, fact sheets, case studies (“100 good reasons initiative”) – *from October 2022 on*
- **Tools:** GIS application on case studies – *from October 2022 on*



Visit us at www.geothermal-dhc.eu and find out more

The 100 good reasons initiative



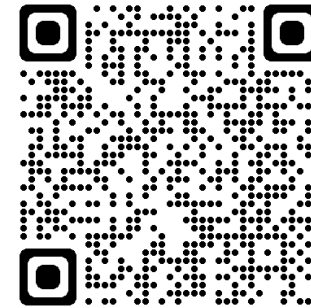
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Invitation to join the "100 good reasons for using geothermal energy in heating and cooling networks" initiative

26/05/2022

Geothermal energy offers various technological concepts to supply heating and cooling (HC) networks at various temperature and capacity levels. The main benefits of using geothermal energy in heating and cooling networks are obvious: **Reduction of energy imports, high energy conversion factors, low environmental impact and surface land consumption and stable and predictable costs**. In combination with other advantages such as the potential for sector coupling, the arguments in favour of geothermal energy are evident for those who already are familiar with it. However, there is still both prevailing low visibility and awareness towards geothermal energy as a sustainable source for heating and cooling networks among relevant stakeholders, such as political decision makers and investors. Too often, these stakeholders still assume that geothermal energy could only be applied at specific geologically attractive regions. Yet the broad range of proven technical concepts in form of shallow, medium and deep systems highlights that geothermal energy is applicable practically everywhere. However, this is often not known outside the geothermal community. Relevant stakeholders might be not aware that technologies they consider not yet mature and established are already successfully implemented in other regions.

To tackle this obstacle, the "100 good reasons for using geothermal energy in heating and cooling networks" initiative ('100 good reason initiative') intends to raise the visibility of successfully operating geothermal HC networks in Europe in order to inform and inspire future market actors. The initiative intends to create a web map application of operating and planned projects linked to informative fact sheets on each site to exhibit the full technological spectrum of geothermal HC networks starting from low temperature local networks (e.g., "5th generation heating and cooling networks") towards conventional large capacity district heating networks.



Scan me to find out more

Upcoming events

Ljubljana (Slovenia) → 3 to 8 July, 2023

International Summer School in Thermogeology, taking place from 3rd to 8th July 2023
in Ljubljana / Slovenia

Topic: Advances in developing geothermal resources for heating, cooling
and electricity production



GEOHERMAL
DHC
Towards Decarbonized
Heating and Cooling!



Upcoming events

Aarhus, Denmark → 19 to 21 September, 2023
Second District Heating and Cooling Day

Preliminary agenda:

Day 1 (Tuesday)

Morning: Travel to Aarhus

Afternoon: Public accessible Workshop on legal and financial challenges related to geothermal heating and cooling networks (**SAPHEA**; **CA18219 Geothermal-DHC**, presentation by Kensa Group)

Day 2 (Wednesday)

Full Day: Geothermal District Heating and Cooling Event **SAPHEA**; **CA18219 Geothermal-DHC, EGEC**)

Day 3 (Thursday)

Full Day: Study tour : geothermal project in Aarhus (Kredsløb and Innargi) **SAPHEA**; **CA18219 Geothermal-DHC, EGEC**)

Publication inside Cost Action

Geothermal Heating and Cooling Networks for Green and Livable Urban Transformations – Part I

For more information:



<https://www.europenowjournal.org/2021/05/10/geothermal-heating-and-cooling-networks-for-green-and-livable-urban-transformations-part-ii/>



Publication inside Cost Action

Geothermal Heating and Cooling Networks for Green and Livable Urban Transformations – Part II

[E europeanowjournal.org/2021/05/10/geothermal-heating-and-cooling-networks-for-green-and-livable-urban-transformations-part-ii/](https://europeanowjournal.org/2021/05/10/geothermal-heating-and-cooling-networks-for-green-and-livable-urban-transformations-part-ii/)



For more information:



<https://www.europeanowjournal.org/2021/05/10/geothermal-heating-and-cooling-networks-for-green-and-livable-urban-transformations-part-ii/>



Publication inside Cost Action

Pathways to better integrate geothermal energy at its full technological scale in European heating and cooling networks

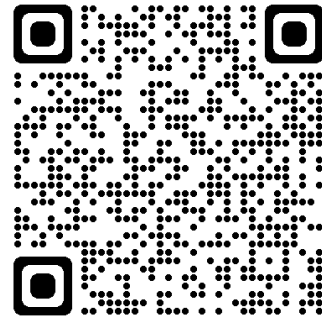
by Gregor Goetzl¹, Jessica Chicco², Christopher Schifflachner³, Joao Figueira⁴, Georgios Tsironis⁵, Aleksandrs Zajacs⁶

For more information:



<https://eurogeologists.eu/goetzl-pathways-to-better-integrate-geothermal-energy-at-its-full-technological-scale-in-european-heating-and-cooling-networks/>

Thank you



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