GEOTHERMAL DISTRICT HEATING AND COOLING

23 September 2021

An event organised by IRENA and EGEC in the framework of the International Conference on Smart Energy Systems and under the Umbrella of the of the Global Geothermal Alliance

Background

The energy systems of the future are envisaged to have the flexibility to integrate electric, thermal and gas grids, all based on renewable energy, to achieve the decarbonisation agenda. The development of the smart energy systems will require that energy related sectors such as electricity, heating, industry and transport be integrated to benefit from the synergies that exist among them, resulting in better operational efficiency.

Renewable-based district heating and cooling systems can be a key component of smart energy systems and at the same time play a major role in the reduction of carbon intensity in the building sector. Geothermal energy is one of the renewable energy resources which can be integrated into district heating systems to decarbonise the building sector through the supply of space heating and domestic hot water.

According to EGEC, there were 327 geothermal district heating and cooling project in Europe in 2019, representing an installed capacity of 5.5 GWth across 25 countries. In the United States, currently there are 23 geothermal district heating systems with an average capacity of 4 MWth. In China, close to 150 million m2 of floor area were heated using geothermal energy through district heating systems in 2018, mainly in the Northern regions of Shandong, Hebei, and Henan province.

Though widely available, geothermal resources remain largely underutilised due to challenges related to public perception, policies, financing, regulations and capacity. As an example, studies in Europe indicate that close to 25% of the population live in areas that can be heated directly using geothermal energy. Therefore, the establishment of enabling frameworks as well as development of innovative tools and methodologies could support the accelerated deployment of geothermal energy into district energy systems. In this regard, more effort is required by different stakeholders to promote the increased development and utilisation of geothermal resources, including in district heating networks.

Objectives, target audience and partners

In the framework of the Global Geothermal Alliance (GGA), IRENA wishes to collaborate with EGEC to co-organise an event to promote the deployment of geothermal energy for heating and cooling. The event will promote the development of district energy networks as a means to increase the share of renewables, including geothermal energy in the heating of building and the supply of domestic hot water. It will facilitate sharing of experiences and best practices as well as highlighting supportive tools, methodologies and options.

Format of the event

The event to promote geothermal district heating and cooling will be held in the framework of the International Conference on Smart Energy Systems[1] , organised by Aalborg University. The conference is scheduled to take place on 21-22 September 2021 in Copenhagen, Denmark. The geothermal district heating event will be held as a side event and is scheduled to take place on 23 September. It will be jointly promoted as part of the conference by IRENA, Aalborg University, and EGEC.

The event will be held virtually over the IRENA zoom platform for a duration of 1h 30 minutes.

1 https://smartenergysystems.eu/

Agenda

Moderator: Jack Kiruja, IRENA

Time (CEST)	Session	Speaker
9:30 – 9:45	**District heating and cooling systems as part of smart energy systems (15 minutes)**	Prof. Brian Vad Mathiesen, Aalborg University
9:45 – 10:05	**Tools and methodologies to support geothermal district heating and cooling (20 minutes)** - GEORISK project	Philippe Dumas, EGEC
10:05 – 10:25	**Integration of geothermal energy in district heating and cooling networks (20 minutes)** - Energy transition in the Netherlands using geothermal energy - Clean heating in cities using geothermal energy: Lessons from China	Eveline Rosendaal, EBN (TBC) Haukur Harðarson, Arctic Green Energy
10:25 – 11:00	**Panel discussion and Q&A (35 minutes)** **- All speakers**	Jack Kiruja, IRENA

***Videos produced by IRENA to promote geothermal district heating in cities may be played during the event**