CAMBRIDGE

The Built Environment Special Interest Group

Cambridge Geothermal Heat Networks, a collective pathway to Decarbonisation of Heat? 27 Oct 2021

Panel

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Challenges

- Big installations work better than smaller but more challenging to win.
- Examine the government strategy.
- Heating and cooling (cooling expected to go up).
- Disruption of installation.
- Archaeology may be a challenge.
- Comparison against ASHPs in terms of economic value.
- Ecological Impacts.
- Compatibility with electricity networks.
- Knowledge Gaps in Industry.

Discussion Points

- Large scale geothermal is generally cheaper per unit energy produced and has better efficiency as capital cost is large fraction of overall cost. However, fragmented land ownership, i.e. between colleges, the university, city council, and common land, leads to potential issues as owners of smaller areas of land may be unable to generate enough for own needs.
- Council has policies in place to decarbonise own building stock by 2030 and is exploring pathways to achieve this, noting the biggest barrier to utilisation of ground-source heat pumps (GSHPs) is capital cost. In process of exploring heat sources and clusters where heat networks would be most suitable. While larger installations are more efficient and cost-effective, the associated cost of disruption and embedded carbon of construction and infrastructure must be considered.
- Diversification using air-source heat pumps: while GSHPs are attractive, unlikely that decarbonisation across city is possible using these alone. Option of also utilising air-source heat pumps (ASHPs) was discussed in situations where space, cost, or a highly de-centralised heat network are present. However, these come with their own limitations, e.g. space needed for heat exchangers, noise in residential areas.
- Coordination between Colleges: many issues faced are shared across Colleges (diversity of estates profile, cost of retro-fitting, lack of land for central sites, disruption during construction, etc.) and in-house experience is not always available. The need for an estates-wide review with strategy recommendations was highlighted to identify 'easy wins' and shard solutions.
- It was highlighted that not all answers need to be available straight away provided installed solutions can demonstrate ability to connect to a heat network in the future. Furthermore, once a network is established, the marginal cost of adding to it falls.
- The possibility of use of the river by riparian colleges for heating and cooling needs was highlighted, citing a government report proposing a heat supply of up to 22 MW.

Opportunities

- UoC to develop large-scale modelling capabilities for citywide assessment of geothermal potential across Cambridgeshire.
- There is a need to integrate sub-surface geothermal potential with above ground demand, in conjunction with economic, logistical, and planning constraints.
- Need for a multi-faceted economic analysis.
- Monitoring and modelling long term impacts of using the river as a heat store.



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