Review of: "The Geobattery Concept: A Geothermal Circular Heat Network for the Sustainable Development of Near Surface Low Enthalpy Geothermal Energy to Decarbonise Heating"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

I appreciated that this paper highlighted:

- The ground will not necessarily stay the same temperature with prolonged use as a sink or source in a climate dominated by either cooling or heating.
- Groundwater movement can potentially mitigate long-term heating or cooling.
- Groundwater movement can transport heat from man-made sources or sinks to locations where it may be useful - effectively acting like a pipeline transporting heat.
- Timing considerations can help optimize the cost-effectiveness.

I felt the paper was thorough, detailed, and provided nice examples and graphics.

A few minor critiques:

- The term “geobattery” is weakly justified by the analysis of different time-courses of heat use and re-heating. But they are primarily describing a heat transport mechanism using groundwater, so I think the battery analogy isn't that useful.
- It would have been enhanced by some early high-level calculations and/or graphics illustrating the limits of ground conduction alone, to highlight the need and circumstances where nothing is needed (e.g., small scale, light heating loads).
- Like so many papers, the language is more complicated than necessary in places. Starting with the title. I would prefer “Groundwater Movement Can Link Heat Sources and Uses and Improve the Performance of Geothermal Heat Pumps." I wish they had written it all as directly as this nice early sentence “A key notion we explore here is that geothermal energy is a renewable form of energy but not necessarily a sustainable one.”