

Peer Review Report

Review Report on Moving from 'doing to' to 'doing with': community participation in geenergy solutions for net zero – the case of minewater geothermal

Perspective, Earth Sci. Syst. Soc.

Reviewer: Tom Hambley

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EVALUATION

Q 1 Please summarize the findings and viewpoint reported.

This paper is a perspective article that suggests six recommendations for incorporating community integration with mine water geothermal energy (MWGE) projects, to contribute to an energy transition that is not only sustainable, but inclusive, just and equitable. The authors suggest through their recommendations that engagement with MWGE projects should be inclusive of a wide variety of stakeholders utilising engagement approaches allowing developers to work with communities to develop wider societal benefits, increasing social capital for often socio-economically disadvantaged communities in regions with mining heritage. These recommendations are aimed at organisations developing MWGE projects, addressing the approaches to engagement and the measurements of their "success", as well as the focus of these approaches longitudinally to ensure that projects are designed to align with cognitions of the past and maximise their contributions in the future.

Q 2 Please highlight the limitations and strengths.

The article succinctly discusses the ways in which engagement can contribute to a fair and just transition through the lens of the emerging technology of MWGE, drawing from a wide range of literature. This culminates in a table illustrating the relationship between various prominent frameworks on engagement. A table drawing upon such a range of frameworks has the potential to suffer from over-complexity, however the authors effectively communicate the relationships they have drawn between them in a clear and useful manner.

In using MWGE, the authors are able to give focus to the socio-economic complexities present in regions with mining heritage, which are explored well through nuanced discussions of place relationships. The longitudinal manner of these relationships are well developed, and strengthen the authors' arguments for engagement to be inclusive, wide ranging and transparent. The recommendations are well founded and logically follow from the discussions in the main body of the article, and focusing these recommendations on project developing organisations to use theory to augment practice is to be admired.

The existing body of literature is well developed for engagement, but is less so for MWGE. As such, some of the claims for the benefits of MWGE are made based upon the explored benefits of more mature technologies, extrapolated from the profile of the technology and the socio-economic profile of high potential regions, or from demonstrator sites around the world. This presents a limitation for some claims of the potential benefits from MWGE, but these do not detract from the value of the paper.

Q 3 Please comment on the reported results and data interpretation. If there are any objective errors or fundamental flaws, you should please detail your concerns.

This article does not report, interpret or analyse data the authors have collected themselves. They instead discuss and make recommendations based upon existing literature and wider contexts within the energy transition. The literature is widely explored and in depth, and the recommendations are well founded.

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

If the manuscript includes original data, are the applied methods accurate and comprehensively described?

Not Applicable.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Not Applicable.

Are the data underlying the study available in either the article, supplement, or deposited in a repository?

Not Applicable.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

The introduction to the paper does well in introducing and tying together approaches to engagement and the suggested role of engagement in the energy transition. Culminating in a useful figure, the article clearly sets out its position on the approaches to engagement and community roles that they will be advocating for. MWGE is then introduced, with an overview of the context of the technology and its contributions briefly explored. The focuses of this introduction set the paper up well for the discussions it will address.

The five principles discussed explore the potential local impact of MWGE to extend beyond that of the energy transition, bringing in conversations around energy justice and nuanced longitudinal place framings. These are utilised to advocate for engagement that allows for communities to explore and articulate their relationships with place and mining heritage, to indicate to potential MWGE developers where best to focus wider benefits. The argument for transparent engagement prioritising equity is framed well through the lens of MWGE, with the socio-economic complexity of ex-mining regions used as pertinent context. The final principle arguing for a whole systems approach ties together the previous four to make a convincing argument for KPIs which move beyond traditional technical measures of the success of a project over its lifecycle to further incorporate indicators which speak to often intangible impacts of project implementation.

The recommendations, founded upon the key principles explored in the body of the article, contribute to existing academic literature in the energy transition field by bringing together energy justice, heritage and place framings and engagement in the context of MWGE. Addressing these recommendations towards organisations allows for this article to offer genuine insight and guidance to project developers at the early stages of technological maturity. Such recommendations for engagement and project measurement at this stage of maturity offers organisations the chance to integrate communities in an impactful and beneficial manner, rather than being an afterthought in the planning process, or swept aside in the name of technological innovation. This therefore is a timely article in the drive towards a sustainable and just energy transition, and in the evolution of MWGE.

There are some minor revisions that I would suggest:

- The six bullet points justifying the use of MWGE make a convincing case for its use, however the final two (114–119) make quite bold claims. These could potentially use referencing from existing literature or expansion to give more context. I agree with the points made, but the fifth bullet point (114–115) in particular may need to be introduced in the introduction or reference literature in the bullet point itself. The sixth (116–119) may need to expand upon or reference existing work when discussing the “negative connotations and consequences” of ineffective engagement.

- The authors discuss MWGE at length, but the article may benefit from a few sentences on the wider geothermal energy context. MWGE is not the only geothermal technology, and it may be useful to introduce MWGE as the selected technology after a brief overview of geothermal technologies, industry and potential. This could also be linked to the recommendations and principles through suggestions that organisations may wish to consider offering technological alternatives to MWGE for communities with mining heritage and historical subsurface relationships. Transparency in engagement is well argued for in this article, and including alternative options could play a role in this. This may also allow for the prior revision to be addressed in an alternative way if literature does not currently exist in specificity to MWGE due to the lack of research currently in the field. Instead, extrapolating potential benefits from more researched elements of geothermal energy would be a sound justification for MWGE being selected for this paper.

- In principle two the authors state: “A MWGE project should not go ahead on the grounds of being technically and economically feasible; wider sustainability considerations, including environmental and social factors must be carefully weighed up.” (172–173). This appears to suggest that if social or environmental factors, including the views of the communities the authors argue integration for, are not favourable for a project then it should not go ahead. This however is not present in any of the recommendations. This is alluded to in recommendation three: “Examine how a project may benefit or disadvantage differing stakeholder groups using a wide lens.” (256), but this could benefit from higher specificity as to what finding such benefits or disadvantages could mean for the project. If the “fair decision making channels” (251) advocated for by the authors were to be so, a recommendation by the authors to allow for the community to reject the project and for this to be respected would be a logical continuation of this argument. To ensure these recommendations are beneficial for both organisations and communities, it may be prudent for the authors to consider a recommendation that ensures that they are followed by organisations for the betterment of the community and not for the success of the project. Links between acknowledgement of place, engagement and MWGE are welcome additions to literature. I feel it important to be stated in this article that the line between acknowledging and taking community place relationships into account, and exploiting them for the benefit of a project developer is thin and should be done with great care. This is particularly so in the areas discussed in this paper with mining heritage facing socio-economic challenges. The authors do great work in advocating for sensitivity and awareness and whilst recommendation two (252–255) discusses this well, the authors could take a firmer stance in ensuring that organisations respect community decision making if they deem projects to be unaligned with their conceptualisations of place, or that attempts to tailor projects to communities are superficial.

- The conclusion could potentially benefit from a few sentences on how experiences of engaging with communities with strong place relationships for MWGE could provide transferable lessons to the wider geothermal energy sector at both the small (individual heat pumps), medium (community owned geothermal technologies i.e. community/district heat networks) and large scales (grid connected deep geothermal power plants).

- Principle 3.3 (174) has an erroneous bracket at the beginning of the heading

This paper was enjoyable to read, and as mentioned throughout this review I am pleased to see the bringing together of engagement, place and MWGE. The nuanced approaches to place in ex-mining regions was a particular highlight, and the literature on engagement was explored clearly to emphasise the important role it can play in the energy transition. Addressing recommendations to organisations requires difficult compromise and the authors navigate this well. I look forward to reading more from them on this subject as the technology, and the approaches used to integrate communities with it mature and evolve.

