



Perspective

Enabling a just energy transition through solidarity in research

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ABSTRACT

A just energy transition is as much about acknowledging and acting on the socio-material needs of marginalised classes and groups as about informing inclusive and deliberative policy-making towards more equitable energy futures. In democracies, energy social scientists hold a privileged position and special responsibility to do both, thus offering critical support to decision-makers and practitioners. We articulate the challenges and opportunities for energy social scientists to embody solidarity in their research orientation and practices. First, we articulate the need to repoliticise, redemocratised, and negotiate a multiplicity of energy transitions. This includes recognising and engaging with multiple scales and contexts of marginality, repoliticising energy transitions, and addressing contestation and negotiation. Then, we argue that by embracing solidarity in research, energy social scientists can meet these needs in a holistic manner. We provide three principles through which social scientists can embrace solidarity to move energy research towards enhancing just transitions. These include (i) taking direct action and relating in solidarity, (ii) recognising responsibilities and limitations of energy social scientists, and (iii) nurturing a political realist culture of solidarity. In espousing these principles, we articulate solidarity as integral to pragmatic research practices in the face of urgency and rapid energy transitions.

1. The need for solidarity in energy social science

A just energy transition remains distant when global trends favour large, powerful incumbent actors who prioritise their own financial or political goals. Inclusion and democratic processes in energy transitions face practical limits and challenges, making just pathways infeasible and excluding many vulnerable stakeholder groups from decision-making. The stakes go beyond the social sustainability of energy transitions, to the very nature of the future energy systems society is actively and rapidly investing in, to mitigate climate change as equitably as possible [1]. Thus, despite its encoding into major energy policies in the 2020s, notably the European Union's Green Deal and its related Just Transition Mechanism, the definition of a 'just transition' remains a complex matter. In a book that discusses its genealogy and contemporary politics, the editors reflect that "The growing references to just transition undoubtedly signal a desire to further root social and equity concerns into the climate debate. While this is to be welcomed, it also complicates the task of identifying what just transition stands for, who is behind it, what

are the underlying politics, and who it is for" [2,p.5].

Given this general thrust in society, issues of marginalisation, democracy, and fairness have come to the forefront of energy transition debates [3]. Yet conducting research that meaningfully includes marginalised communities in co-production processes is demanding [4]. Technological solutions capture more attention than the socio-economic and historical-institutional inequalities that shape place-specific impacts [5]. While energy social scientists draw on various participatory approaches, there is nonetheless a need to sharpen focus on inclusion, justice and equity in energy social science. Such an emphasis can safeguard against depoliticising and reaffirming existing power relations, thereby critically challenging them, which is an important objective of scholarly practice in a world rife with energy and environmental exclusion, injustice and inequity [6,7].

How then can energy social scientists best act in and against these larger power structures? We argue that researchers can advance just energy transitions by enacting solidarity in their work, i.e., by identifying and standing up for those whose voices are subdued to enlarge the

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scope of debate, and systematically exposing the political nature of the conflicts that energy transitions bring to the fore.

Solidarity has drawn limited interest in extant energy social science, although interest has emerged. For instance, drawing on [8], Kumar and Aiken [9,p.201] mobilise “solidarity as a place-holder for reciprocal relationships of subjective morality and responsibility towards one-another [*sic*] that bind humans together” in their postcolonial critique of community energy in Scotland and India. Yet the concept has not been applied to the praxis of energy social science, which our Perspective aims to induce. We are inspired by Glesne’s call for research as solidarity, where “Solidarity implies working with others in a research endeavor determined by others’ needs and perceptions in conjunction with our own” [10,p.171]. The author goes on to argue that “Research as solidarity ... implies that as researchers, we consider our academic communities and how our connections, constraints, and obligations there have implications for the people with whom we work.” [10,p.174–175].

We borrow from an understanding of solidarity informed by ethics and political philosophy, wherein “[t]he concept of solidarity is relative to a concept of community” [11,p.30]. Here, solidarity is defined as “the tie which binds all of us human beings to one big moral community” [11,p.5]. However, Bayertz [11,p.4] notes that “positive obligations to act ... are difficult to incorporate within mainstream ethical and political thought”. He traces the conceptual evolution of solidarity from the Roman law of obligations to a “principle of mutual responsibility between the individual and society ... applied to the field of morality, society and politics” in the 18th and 19th centuries, before coming to be “comprehended as a mutual attachment between individuals” [11,p.1]. The ambiguous nature of the concept thus makes it important to articulate principles for espousing it in energy social science. Correspondingly, as its main contribution, our Perspective offers three principles of solidarity in research for energy social scientists. These are an outcome of reflexive discussions among several energy social scientists prior to, during and after a focused workshop, aimed at nurturing engagement.

2. Repoliticising and negotiating a multiplicity of energy transitions

This section first delineates the gargantuan scope of the challenge of just energy transitions, which spans multiple, co-shaped scales and contexts of marginality. Second, it explicitly suggests repoliticising energy transitions as changes in sociotechnical systems that entail controversial choices. Third, it acknowledges the role of contestation, highlighting negotiation as a critical process where energy social science can add value. The next section then presents our three principles, followed by a concluding section that addresses the need for pragmatism in energy social science at this historical moment.

2.1. Multiple scales and contexts of marginality

Just energy transitions raise the issue of marginality at multiple scales and in highly varied contexts. At the national scale, participation and inclusion represent serious challenges for democratic processes: who is included, whose voice is heard, and who is marginalised by not being at the table. These concerns have been voiced by many energy social scientists, often in the influential framing of energy justice [12]. Gaps in democratic praxis, in combination with rampant socioeconomic and environmental inequalities, limit the extent and quality of participation. This excludes many societal actors from exercising democratic influence over decisions that exert huge impact on their lives.

This exclusion relates to historical power structures and intersecting inequalities based on gender, sexual orientation, race, class and caste divisions, that produce marginality for both individuals and communities [13,14]. Indeed, to enact just energy transitions, inequalities and exclusions are better understood from the embodied practices that unfold in workplaces and households. The oft-invoked divide between the Global South and Global North on energy use is germane to

considerations of just transitions [15] but might be inadequate to address various forms of exclusion. Inequalities run deep at national, sub-national and local scales as well. Frameworks such as the ‘powers of 10’ [16] have emerged to address which scales these issues can and should be addressed at, arguing to prioritise action at and between the urban and sub-urban scales for convergent impact across the multiple scales of these challenges, which are simultaneously local and global. Such tools can be used to determine desirable characteristics for changes in energy systems at particular scales to secure justice and equity.

2.2. The repoliticisation of energy transitions

Politicians routinely portray climate change as a problem to solve through technological fixes. While technological development is important for climate mitigation, technological access and development are themselves mediated by social relations of power [17]. Over-emphasising technological solutions has a depoliticising effect, as does overemphasising ‘sustainable lifestyles’ while neglecting systemic factors for tackling climate change [18].

Energy transitions are inherently political. Their depoliticisation reduces complex sociopolitical issues to techno-managerial problems, inducing demand for expertise managed by administrative agencies [19]. Depoliticisation prevents ‘politics as dissensus’ by disallowing underlying value conflicts on socio-ecological issues [20]. It obviates alternative futures by (re)producing a discursive reality with “nothing to be seen or heard beyond the status quo” [21,p.835].

Yet, the multidimensional complexities of climate change obliterate the option of treating energy transitions as value-neutral, techno-managerial matters of expertise [22]. Just transitions entail articulating and pursuing contentious energy politics to repoliticise the energy transition, moving beyond empty symbolic politics of ‘sustaining the unsustainable’ [23]. Repoliticisation requires *creating space* for “conflict and debate on different ways to conceive of current and future society” [21,p.834], making both depoliticisation and the contingent possibilities it conceals more visible. As such, repoliticisation should simultaneously be aligned with broader democratisation processes, and not just reinforce the political codes of being (re-)elected versus not being (re-)elected.

2.3. Contestation and negotiation

Energy social scientists are constantly faced with dilemmas where pathways are contested. The same intervention can be seen by some actors as advancing low-carbon transitions, and by others as subverting justice [24]. Yet others see justice claims as protecting incumbent interests, or holding back essential change to address urgent climate mitigation needs, thus leading to global scale injustice [15,25]. Consequently, energy social scientists increasingly attend to contestation as inevitably part of energy transitions, and must deal with a variety of concerns concomitant to their research focus. These concerns conceivably include the potential for friction with academic institutions and funders, heightened potential for transgressing cultural boundaries and expectations of what is appropriate in research, challenges to perceived impartiality, and the task of balancing responsibilities to local communities and larger global epistemic communities. Indeed, changing entrenched energy systems without contestation is hardly conceivable.

Yet in itself, contestation can cause predatory delay [26] and mitigation deterrence [27]. To acknowledge and address contestation requires negotiation clearly oriented towards just, inclusive, equitable transitions. Rather than the incumbency that even energy researchers unwittingly get enrolled into through rigid academic practices [28], negotiation must enlarge space for a ‘green democratic revolution’ [29]. This requires building broad societal arenas of engagement, not echo chambers of narrow consensus, to realise an inclusive politics of energy transition, and build broad political constituencies, a ‘climate coalition of the willing’ [30].

Here, energy social scientists can create value by bringing understanding of negotiation from democratisation and governance scholarship (e.g., [31]) to bear on transition debates. This can take forms of solidarity in research, such as suggesting institutional mechanisms for deliberation, critiquing exclusionary processes, and highlighting cases where negotiation has overcome taut contestation.

3. Principles of solidarity in research for energy social scientists

Correspondingly, we reflect upon solidarity as a key principle to govern scholarly engagement, and propose three principles of solidarity in research for energy social scientists. Energy transitions require synergised efforts by energy researchers and marginalised communities to foster agency and address key injustices. Despite recent work such as [32] which proposes revisiting types of solidarity entailed by infrastructural heterogeneity, the conceptual toolbox of solidarity remains insufficiently developed and unpacked in energy research.

Energy research does recognise the shortcomings of mainstream modes of public engagement with energy transitions, such as surveys, as only scratching the surface. Chilvers et al. [5] underscore a plethora of novel modes in the UK: digital tools, social media, mass protests, and adoption of distributed energy systems. A review shows that rapid energy transitions require deeper citizen participation and rights; safeguarding against lobbyism by vested interests; affirmative action to bolster marginalised groups in decision-making; support for informed public debate on just energy transitions; and shoring up the trustworthiness of political institutions [4].

In the absence of proactive participatory efforts in energy decision-making, Leifsen et al. [33] point out that marginalised communities can challenge exclusionary practices in innovative ways that can inform best practices on just transitions. Social resistance to extractive projects in Latin America shows how marginalised communities – here often Indigenous peoples and the rural poor – actively demand the ‘right to decide’ about their futures through public decision-making processes. These modes of participation leave the authoritative role of the state as the steward and decision-maker over natural resources unchallenged. Over time, sustained social mobilisation can yield emancipatory tools beyond state control [34]. We think the state can play an important role by acting in solidarity with, rather than in opposition to, local and indigenous communities. In this way, public institutions and popular trust in them can be strengthened, rather than splintering and polarising society.

The first principle of solidarity we propose targets diverse opportunities for direct solidarity. The second is reflexive and aims to recognise and honour solidarity within the scope of scholarly practice and identities. The third interprets solidarity in relation to both critique and solutionism, to propose a political realist culture of solidarity.

3.1. Principle 1: taking direct action and relating in solidarity

Untangling the complexities of action for solidarity is meaningful in itself. Energy social scientists must consider how their everyday practices identify and prioritise the questions people in marginalised communities need addressed. Two direct ways can enable such advances.

First, energy social scientists must include diverse members from marginalised groups in their work. Funds can be channelled towards covering full-time salaries for active involvement in co-creating research questions, to develop innovative approaches to just transitions with high societal relevance. Enhanced direct communication between researchers and marginalised community members enables active forms of listening, safeguarding against researchers making a priori assumptions about others' needs.

Second, energy research must be non-extractivist, affording interlocutors room to express agency in study designs and ethnographic analyses. Shared experiences, including for quantitative researchers, help engender solidarity and a sense of urgency to produce knowledge

that improves life at the margins. Shared experiences of vulnerability can produce deeper insights, while staying mindful of the precarity researchers expose themselves to in the many contexts they study, and prioritising personal wellbeing.

Caveats apply. Not all energy social scientists fit such aspirations equally well for various valid reasons. Some require slowing research outputs to ensure solidarity in their actions, which broader academic metrics should support. This may well hold for those engaged in action research and detailed ethnographic work whose engagement with marginalised groups over time require careful attention to ethics and complex risks on the ground. Others might uphold ethics such as lowering their research related aviation emissions, or slowing the pace of outputs to undertake deeper, sustained conceptual engagement, while exercising a work-life balance that includes personal care responsibilities, which can vary widely. Yet energy social scientists can emulate many who embody solidarity in academic practice.

3.2. Principle 2: recognising responsibilities and limitations of energy social scientists

It is important to enshrine solidarity as a virtue of just transitions that is sought-after and incorporated in imaginaries of desire, including for energy social scientists. Placing greater emphasis on efforts by energy social scientists to espouse solidarity in their thematic focus, methodological approaches, and outputs in career progression and award schemes can incentivise and encourage desirable action. This can compensate for trade-offs that may otherwise force energy social scientists to prioritise technology-centred activities and other externally modulated drivers of research orientation such as availability of focused funding. Energy social scientists can create forums to discuss responsibilities, their own positionality, and limitations, to help identify barriers to solidarity and to enlarge arenas to shift academic practices.

Energy social scientists who conduct fieldwork outside their everyday contexts take on additional responsibilities and expand scope for novel insights. Extended engagement with particular groups comes with its own entanglements: important questions concern how we can contribute without building dependency on researchers, and how we can avoid unwittingly exposing others to risk when studying sensitive topics. Approaches anchored in solidarity entail being reflexively aware of one's own limitations alongside embraced responsibilities, and finding feasible levels of being attentive to the vitalities in the lives of others.

3.3. Principle 3: nurturing a political realist culture of solidarity

Over time, solidarity should be standardised as a key element of just energy transitions. Luminaries of social engagement and transformation, such as Ivan Illich through his work on tools for conviviality [35] and Paolo Freire's celebrated work on the pedagogy of the oppressed [36], have paved the way for engagement along such lines in wider social life. Given the ubiquity of energy in everyday practices and the heightened attention to rapid changes in energy systems due to the urgency of climate change mitigation [37], energy social scientists have an important role in denouncing unequal power structures, exclusive practices, and hegemonic discourses, to repoliticise energy transitions. It is important that they think critically – as individuals and as a collective – about the actors and actions whose legitimacy they amplify in research projects and outputs, so as to not reproduce power inequalities in energy research [28]. Energy social scientists and marginalised groups can co-create ‘prefigurative politics’ [38], political strategies that demonstrate radical change as a means towards institutionalising it.

Thus, for each research output, energy social scientists must consider: whose voices, whose interests and whose fights does it broadcast? Whose voices and interests are absent? Who and what is this work (de-)legitimizing? This requires context-specific thinking about what ends research serves and how, to secure solidarity in energy

research that accords marginal voices and claim-makers consideration. It also requires recognising the limits of scientific knowledge under rapidly changing sectors and circumstances, and being explicit about engaging with and learning from diverse societal actors.

4. Pragmatism in the face of urgency and rapid energy transitions

To conclude, we temper the practical scope of enacting these principles with the urgency and temporality of change, in line with the unforgiving challenge of rapid energy transitions. Energy research practices sit at an important intersection in the novel situation of the need to act boldly despite conditions of uncertainty. Numerous calls for more inclusive and participatory governance practices notwithstanding, many renewable energy projects still emerge from very top-down processes of design and implementation. Measures to foster participation are mostly construed as improving awareness and social acceptance [39], rather than for profoundly rethinking and democratising energy systems. To change this state of affairs, we have proposed principles of solidarity in research for energy social scientists to (i) take direct action and relate in solidarity, (ii) recognise responsibilities and limitations of energy social scientists, and (iii) nurture a political realist culture of solidarity. In espousing these principles, we articulate solidarity as integral to pragmatic research practices in the face of urgency and rapid energy transitions.

In the short term, some structural issues are too 'sticky' to dismiss entirely when mitigating injustices, such as wider democratic participation in energy decision-making which has traditionally been a largely technocratic process, or the uneven control over capital that is important to mobilise quickly given the urgency of climate change mitigation, thus biasing ownership and benefits to already privileged actors. Yet over time, solidarity in energy social science can plant seeds to imagine and change transition pathways. This epistemic community can thus co-create a prefigurative politics of just transitions [38]. This embodiment can standardise solidarity as a key element for just energy transitions, to promote a culture of engendering, diversifying, recognising, honouring and mainstreaming solidarity in action.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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References

- [1] X. Wang, K. Lo, Just transition: a conceptual review, *Energy Res. Soc. Sci.* 82 (2021), 102291.
- [2] E. Morena, D. Krause, D. Stevis, *Just Transitions. Social Justice in a Low-Carbon World*, Pluto Press, London, 2020.
- [3] A.P. Ravikumar, E. Baker, A. Bates, D. Nock, D. Venkataraman, T. Johnson, M. Ash, S.Z. Attari, K. Bowie, S. Carley, S. Castellanos, Enabling an equitable energy transition through inclusive research, *Nat. Energy* (2022) 1–4.
- [4] J. Pickering, T. Hickmann, K. Bäckstrand, A. Kalfagianni, M. Bloomfield, A. Mert, H. Ransan-Cooper, A.Y. Lo, Democratising sustainability transformations: assessing the transformative potential of democratic practices in environmental governance, *Earth Syst. Gov.* 11 (2022), 100131.
- [5] J. Chilvers, R. Bellamy, H. Pallett, T. Hargreaves, A systemic approach to mapping participation with low-carbon energy transitions, *Nat. Energy* 6 (3) (2021) 250–259.
- [6] J. Agyeman, D. Schlosberg, L. Craven, C. Matthews, Trends and directions in environmental justice: from inequity to everyday life, community, and just sustainabilities, *Annu. Rev. Environ. Resour.* 41 (2016) 321–340.
- [7] B.K. Sovacool, Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation, *Energy Res. Soc. Sci.* 73 (2021), 101916.
- [8] P. Chatterjee, The nation and its peasants, in: V. Chaturvedi (Ed.), *Mapping Subaltern Studies and the Postcolonial*, Verso, London, 2012, pp. 8–23.
- [9] A. Kumar, G. Taylor Aiken, A postcolonial critique of community energy: searching for community as solidarity in India and Scotland, *Antipode* 53 (1) (2021) 200–221.
- [10] C. Glesne, Research as solidarity, in: Norman Denzin, Michael Gardina (Eds.), *Ethical Futures in Qualitative Research*, Routledge, 2016, pp. 169–178.
- [11] K. Bayertz, *Solidarity Vol. 5*, Springer Science & Business Media, 1999.
- [12] N. van Bommel, J.I. Höffken, Energy justice within, between and beyond European community energy initiatives: a review, *Energy Res. Soc. Sci.* 79 (2021), 102157.
- [13] C.E. Cannon, E.K. Chu, Gender, sexuality, and feminist critiques in energy research: a review and call for transversal thinking, *Energy Res. Soc. Sci.* 75 (2021), 102005.
- [14] J.C. Stephens, *Diversifying Power: Why we Need Antiracist, Feminist Leadership on Climate and Energy*, Island Press, 2020.
- [15] P. Newell, D. Mulvaney, The political economy of the 'just transition', *Geogr. J.* 179 (2) (2013) 132–140.
- [16] A.K. Bhowmik, M.S. McCaffrey, A.M. Ruskey, C. Frischmann, O. Gaffney, Powers of 10: seeking 'sweet spots' for rapid climate and sustainability actions between individual and global scales, *Environ. Res. Lett.* 15 (9) (2020), 094011.
- [17] A. Hornborg, Artifacts have consequences, not agency: toward a critical theory of global environmental history, *Eur. J. Soc. Theory* 20 (1) (2017) 95–110.
- [18] M.T. Huber, *Climate Change as Class War: Building Socialism on a Warming Planet*, Verso Books, 2022.
- [19] E. Swyngedouw, *Promises of the Political: Insurgent Cities in a Post-Political Environment*, MIT Press, Cambridge, MA, 2018.
- [20] J. Rancière, *Dissensus: On Politics and Aesthetics*, Bloomsbury Publishing, London and New York, 2010.
- [21] A. Kenis, Post-politics contested: why multiple voices on climate change do not equal politicisation, *Environ. Plan. C: Polit. Space* 37 (2019) 831–848.
- [22] A.G. Sveinsdóttir, M.F. Johnson, Doubling down on DAPL: the contentious politics of pipeline governance in Illinois, *Environ. Polit.* (2022) 1–22.
- [23] I. Blühdorn, Sustaining the unsustainable: symbolic politics and the politics of simulation, *Environ. Polit.* 16 (2) (2007) 251–275.
- [24] S. Williams, A. Doyon, Justice in energy transitions, *Environ. Innov. Soc. Trans.* 31 (2019) 144–153.
- [25] G. Bridge, S. Barr, S. Bouzarovski, M. Bradshaw, E. Brown, H. Bulkeley, G. Walker, *Energy and Society: A Critical Perspective*, Routledge, London, 2018.
- [26] A. Steffen, *Predatory delay and the rights of future generations*, Medium.com, 2016. <https://medium.com/@AlexSteffen/predatory-delay-and-the-rights-of-future-generations-69b06094a16> (accessed 20.12.2022).
- [27] N. Grant, A. Hawkes, S. Mittal, A. Gambhir, Confronting mitigation deterrence in low-carbon scenarios, *Environ. Res. Lett.* 16 (6) (2021), 064099.
- [28] A. Stirling, How deep is incumbency? A 'configuring fields' approach to redistributing and reorienting power in socio-material change, *Energy Res. Soc. Sci.* 58 (2019), 101239.
- [29] C. Mouffe, *Towards A Green Democratic Revolution: Left Populism and the Power of Affects*, Verso Books, 2022.
- [30] T. Hale, A climate coalition of the willing, *Wash. Q.* 34 (1) (2011) 89–101.
- [31] A.E. Poppe, J. Leininger, J. Wolff, Beyond contestation: conceptualizing negotiation in democracy promotion, *Democratization* 26 (5) (2019) 777–795.
- [32] F. Pilo, Infrastructural heterogeneity: energy transition, power relations and solidarity in Kingston, Jamaica, *J. Urban Technol.* (2022) 1–20.
- [33] E. Leifsen, M.T. Gustafsson, M.A. Guzmán-Gallegos, A. Schilling-Vacaflor, New mechanisms of participation in extractive governance: between technologies of governance and resistance work, *Third World Q.* 38 (5) (2017) 1043–1057.
- [34] D. Vela-Almeida, A. Gonzalez, I. Gavilán, G.M.F. Sánchez, N. Torres, V. Ysunza, The right to decide: a triad of participation in politicizing extractive governance in Latin America, *Extr. Ind. Soc.* 9 (2022), 100875.
- [35] I. Illich, *Tools for Conviviality*, Harper & Row, New York, 1973.
- [36] P. Freire, *Pedagogy of the Oppressed* (MB Ramos, Trans.), Herder and Herder, New York, 1970.
- [37] H. Haarstad, J. Grandin, K. Kjærås, E. Johnson, Haste: The Slow Politics of Climate Urgency, UCL Press, London, 2023.
- [38] A. Törnberg, Prefigurative politics and social change: a typology drawing on transition studies, *Distinktion J. Soc. Theory* 22 (1) (2021) 83–107.
- [39] N. Komendantova, M. Riegler, S. Neumueller, Of transitions and models: community engagement, democracy, and empowerment in the Austrian energy transition, *Energy Res. Soc. Sci.* 39 (2018) 141–151.