Energy Research & Social Science 80 (2021) 102242

Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Perspective

# Cultural imaginaries or incommensurable ontologies? Relationality and sovereignty as worldviews in socio-technological system transitions

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ARTICLE INFO

*Keywords*
Energy sovereignty
Energy democracy
Pluralist ontologies
Socio-technological system transitions

ABSTRACT

Scholars bridging the fields of science and technology studies (STS) and energy research in social sciences (ERSS) offer a rich and integrated conceptualization of how energy systems are imbued in social systems, including cultures, social structures, institutions, and social relations of power. Yet as fields of study, STS and ERSS are dominated by approaches to understanding nature, culture, and relationships among them with origins in western European Enlightenment thinking. In this article, we argue that the language of "imaginaries" provides an understanding of culturally organized normative commitments but may obscure attention to what are actually diverse and sometimes incommensurable yet legitimate plural ontologies. Tribal Nations, Indigenous communities, and other non-Western worldviews are not simply imagined; they offer different teachings regarding the relational and embedded realities governing relations among human and more-than-human beings across time and space. The field of STS has a rich history of exploring ontological controversies and provides insight into understanding diverse and competing perspectives in science and technology, yet without articulating the connection between this conceptual terrain and the lived realities of socio-technological system entrenchment or change. ERSS recognizes participation, energy system democratization, and even co-production as components of a just energy transition, while most typically thinking about participation as a methodology or research approach rather than as requiring consideration and even wholesale reconceptualization of ontological foundations. To advance convergent, transdisciplinary social science research in socio-technological transitions requires grappling with plural ontologies regarding the reality of relations in the world. Here, we explore diverse ontologies shaping the realities of energy systems through the lens of Tribal Nations in the Great Lakes region in the United States. Ontologies that recognize reciprocal relationships among human and more-than-human beings as well as the sovereignty of these beings and their collective kinships suggest fundamentally different priorities for energy systems transitions. Moving beyond the language of imagination to recognize that cultures can involve diverse and sometimes incommensurable pluralistic ontologies is essential for developing inclusive and just frameworks for socio-technological system transitions.

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https://doi.org/10.1016/j.erss.2021.102242
Received 14 January 2021; Received in revised form 4 August 2021; Accepted 5 August 2021
Available online 4 September 2021

## 1. Introduction

*Gijigijigaaneshiinh ayaa gawaandag*
*noondaagozid noondenimiyangidwa*
*manidookeyaang manidoowiyaang*
*The marsh chickadee is there in the white pine*
*calling out, wanting to be with us*
*it's a ceremony, a way to be alive.*

From Gijigijigaaneshiinh/Chickadee in What the Chickadee Knows [1], in Anishinaabemowin and English

The field of science and technology studies (STS) includes decades of scholarship on how technologies are never just material things situated within economic systems but rather always involve multifaceted social processes [2–4]. Recent scholarship bridging the fields of science and technology studies (STS) and energy research in social sciences (ERSS) offers a rich and integrated conceptualization of how energy systems are embedded in social systems, including cultures, social structures, institutions, and social relations of power [5–6]. However, STS and ERSS fields are dominated by understandings of nature, culture, and the relationship between the two that originated in western European Enlightenment thought. While these understandings are not monolithic, they are imbued with the legacies of colonization and racialized structures of power [7–10]. These origins limit the ontological diversity of scholarship examining the socio-technological systems transitions associated with energy.

In this paper, we are describing ontologies as collective understandings of the nature of reality, shared knowledge regarding what is real, which determines the nature of understood relationships among human and more-than-human beings. The field of STS has a rich history of exploring ontological controversies regarding the nature of truth and reality in the construction of scientific knowledge [11–13]. These contributions provide insight into understanding diverse and sometimes competing perspectives regarding science, technology, and their roles in societies [14–17]. Ontology has been interrogated in terms of competing philosophies of science and in its role in empirical understandings of science [18–22]. Scholarship in STS often interrogates ontology conceptually; however, the conceptual terrain of ontologies shapes meanings, interpretations, and decisions regarding the lived realities of socio-technological system entrenchment or change, specifically in how access to energy as a basic human need is organized through socio-technological systems that are socially constructed and maintained through social relations of power.

As described below, the field of STS has also embraced the concept of "imaginaries" as a way to explain divergences across national or cultural contexts in decision making regarding science and technology, and this concept is being integrated into STS approaches to studying energy transitions [5,6]. The concept of imaginaries provides a means of examining collectively held and often unquestioned beliefs, values, and ideas about what ought to be that enter into decision making regarding science and technology. However, as we argue, emphasizing imaginaries without examining ontologies may obscure significant, tangible differences in how groups understand the very nature of reality, and these differences may be key to understanding who is involved and what decisions are made when it comes to energy systems transitions.

ERSS recognizes participation, energy system democratization, and even co-production as components of a just energy transition. Research in ERSS may solicit broader participation in energy transition planning through research methods [23] and analysis of the requisite components of a just transition [24–26]. Yet this research rarely questions the degree to which researchers and communities engaged through research and decision-making for energy transitions have either shared or divergent foundations underpinning their understandings of truth and the nature of relations shaping engagement with the world.

In this article, we argue that the language of imaginaries cannot capture the realities of diverse and incommensurable yet legitimate pluralistic ontologies. Tribal Nation, Indigenous communities, and other non-Western worldviews are not simply imaginaries; they offer different teachings regarding the relational and embedded realities governing human and more-than-human beings across time and space [10]. This perspective is methodologically derived from our collective experiences working on energy transitions in both rural and Indigenous communities [27], and it is intended to demonstrate the need for researchers and decision makers to reflect on and even challenge their own understandings of what is real and true in the world so that they can more meaningfully engage with diverse communities who may have different ontologies underpinning their relationships in the world.

Only by digging into ontologies can we truly engage in inclusive decision making about collective energy futures. To advance convergent, transdisciplinary social science research on socio-technological transitions requires grappling with plural understandings of humans and their position and relations in the world. Here, we explore diverse ontologies shaping the realities of energy systems through the lens of Tribal Nations in the United States' Great Lakes region. Ontologies that recognize reciprocal relationships among human and more-than-human beings as well as the sovereignty of these beings and their collective kinships suggest fundamentally different priorities for energy systems transitions.

Moving beyond the language of imagination to recognize that cultures can involve diverse and sometimes incommensurable ontologies [28] is essential to developing inclusive frameworks for socio-technological system transitions in the realm of energy and beyond. This is the case for two reasons. The first is because we cannot fully engage in participatory research meeting the tenets of energy justice [24–26] without accepting the reality of research collaborators as valid even if different from our own. Second, ontologies that differ from those stemming from Enlightenment-grounded Western European thought provide useful teachings. They may assist us in moving beyond the current energy access systems creating such catastrophic consequences for people and the planet [10].

We recognize the concern that, "To invoke Indigenous ontologies… is to tread on intellectual terrain that is heavily shaped by colonial inheritances and interests" and that we should be "wary of how Indigenous knowledges, beliefs, and practices are represented and mobilized within colonial structures of knowledge production" [29:19]. Some scholars criticize the language of ontology itself [30]. Decolonization of energy research will require a complete rethinking of engagement and energy systems, not a shallow overlay of Indigeneity across existing structures of power and ways of thinking. Others have argued that long term friendship is one way to meaningfully engage [31] or that harvesting principles can be applied to energy in addition to other ecological gifts [10]. In this article, we argue that relationality and sovereignty, the reality of relationships among and the sovereignty of all living beings, are two elements of an Indigenous ontology based on Anishinaabe knowledges that provide particularly valuable teachings for rethinking the energy system transition. Understanding how to integrate these teachings regarding the nature of the world into energy systems research will likely require changing how we conceptualize research, data, and relations [32–35], ultimately shifting how we conceive of energy systems in terms of their realities, their truths, and the acceptability of their consequences.

## 2. Imaginaries or ontologies?

Scientific knowledge and technological artifacts are neither purely objective nor purely material. The field of science and technology studies (STS) acknowledges this and examines how society shapes and is shaped by science and technology. Jasanoff explains: "In popular discourse the word "technology" tends to be equated with machine or invention, something solid, engineered, black-boxed, and these days most likely an instrument of electronic communication…. [Yet]

technological objects… are thoroughly enmeshed in society, as integral components of social order" [36:2]. In STS, the concept of co-constitution is a well-established way to discuss the social embeddedness of science and technology and the ways they relate to social ideas, structures, practices, and institutions. Yet as Jasanoff writes: "For all its analytic potential…the notion of co-production does more to advance the Weberian project of *Verstehen* (understanding subjectively how things fit together) than the scientific goal of *Erklären* (explaining objectively how things come to be as they are)" [36:3]. In other words, "co-production" is not sufficiently explanatory.

To provide a more comprehensive tool with adequate explanatory power for explaining how science and technology come to be, Jasanoff introduces and develops the concept of "imaginaries" [5,6,36–38]. Jasanoff and Kim describe imaginaries as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific scientific and/or technological projects" [39:120]. After developing the concept as an analytical tool to help make sense of differences across national contexts [39], Jasanoff further developed the concept and redefined imaginaries as "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology" [36:4]. According to Jasanoff, "imaginaries… encode not only visions of what is attainable through science and technology, but also of how life ought, or ought not, to be lived; in this respect they express a society's shared understandings of good and evil" [36:4]. Explaining the relationships between science, technology, and society, the term "imaginaries" emphasizes the normative diversity in values, priorities, and senses of the good life across social contexts.

For Jasanoff, moreover, imaginaries are national [38,39] or at least collective [37] understandings of what is desirable and what ought to be, although Jasanoff and Kim also recognize, relying on Arjun Appadurai, that imaginaries do not represent a "universal, homogenous modernity" [37:7]. Building on Benedict Anderson's *Imagined Communities* [40], Jasanoff and Kim describe imaginaries as emphasizing the shared sense that builds a nation [37]. However, Anderson's historical account of nation-building sits uncomfortably with postcolonial politics, as Anderson's "imagined communities" allows for European colonizers' continued domination of non-Western peoples, again, through schools, media, and similar institutions [41].

As we argue, the replacement concept of "imaginaries" is not fully adequate to explain social differences in how science and technology are understood, the social relations of power that lead to technological entrenchment, or the inequities perpetuated through science and technology. Although the concept of imaginaries is intended to provide a tool for bringing the perspectives of "non-experts" more explicitly into the field of STS inquiry [37], perhaps because of Anderson's influence, it implies a Bourdieun sense of thinking about the state while thinking like the state [42], or using the ontological categories of the state, which align with rather than contradicting the ontological categories used by science. Using this idea of imaginaries to understand conflicting views across cultural differences may offer a simplified way of explaining differences in priorities, principles, and worldviews. The concept obscures the fact that imagined cultural differences regarding what is desirable are often contingent upon concrete differences in what is known to be real and true rather than imagined.

## 3. Ontologies of sovereignty and relationality in Great Lakes Tribal Nations

The North American Great Lakes region surrounds five massive lakes (Erie, Huron, Ontario, Michigan, and Superior) and includes two countries (Canada and the United States). Eight U.S. states and one Canadian province physically compose the surrounding inter-national shorelines. *Nayaano-nibiimaang Gichigamiin* (the Great Lakes) is also the ancestral and contemporary homelands for at least 163 Anishinaabe Tribal nations who have sustained rights and responsibilities with human and more-than-human kin in community and who retain shared governance responsibilities with the U.S. and Canada [43].

*Nayaano-nibiimaang Gichigamiin* is and has always been governed by sovereign law. The foundation for sovereign law is rooted in the Anishinaabeg First Treaty, also called Sacred Law, Original Instructions, and the Great Laws of Nature [44]. The First Treaty is the long-standing agreement between the Creator and all orders of creation that all beings are relatives of one another, interdependent upon one another, and will honor, respect, and care for each other. As adapted, "Kitche Manitou then made The Great Laws of Nature for the wellbeing and harmony of all things and all creatures. The Great Laws govern the place and movement of sun, moon, earth and stars; govern the powers of wind, water, fire and rock; govern the rhythm and continuity of life, birth, growth and decay. All things live and work by these laws" [44]. The Great Laws are timeless across generations. Humans are one sovereign among many sovereigns, including plant, fish, and other wildlife being nations. Being sovereign requires diplomacy and consensual relations [45]. This is Sacred Law grounded in respect among all beings for one another's autonomy.

In addition to being grounded in the sovereignty of all beings, Anishinaabe ontology, like many other Indigenous ontologies, is simultaneously rooted in kinship and relationships, as it "is not the realities in and of themselves that are important, it is the relationship that I share with reality" [46:177]. Land is kin, an anchor to collective identity and ways of knowing [47]. Ways of knowing, *Anishinaabe-gikendaasowin,* are "knowledge, information, and the synthesis of our personal teachings" [48:11]. Understanding is sought by embracing complexity, all things in relation to others. The Anishinaabe learn from the land how to be human [10]; humans are pitiful as knowers and are obligated to learn from other, much wiser, knowers, such as the air, the water, the rocks, the soil, the trees, the wildlife, and other living beings [44]. Located in the lived experience of families, communities, and past and future generations, *gikendaasowin* cannot be separated from the land; all knowledge needed to live sustainably exists in the landscape [49]. "The land can be understood as a set of 'relationships of things to each other'" [50:23], or as our "self-in-relation" [51:27]. As described by an Anishinaabe scholar, "Within an Anishinaabe ontology, all plants, animals, trees, rocks, rivers, and lakes are sentient beings who have their own spirit, personality, language, knowledge, and law" [10]. *Gikendaasowin* belongs to everyone [48] and is used to make decisions while living in relationship with others [52].

For Anishinaabe, animals are human siblings, older siblings, teachers; the animals adopted us, and we could not live without our kinship relations with them [53]. Direct and ongoing communication with nonhuman beings is an accepted Anishinaabe methodology for attaining *gikendaasowin* [44,49,50]. This includes recognizing that the wind, the sun, and the water, three forms of life central to human access to electrical energy, are not resources to be harvested, but teachers to learn from and with whom to engage in reciprocal relations [10].

Recognizing Indigenous ontologies can begin by acknowledging the the role language plays in revealing a culture's way of knowing the world [54,55]. While Western European frameworks are not monolithic, they "do not have the capacity to communicate Indigenous relationships to land and life" [56:xiv]. The language of the Anishinaabe, Anishinaabemowin, provides meanings that cannot be expressed in English, and English includes terms that are out of place in Anishinaabe ways of knowing. As a "language of animacy" [57,10], Anishinaabemowin identifications are based on their active relationships and engagements in the world. Further, in Anishinaabemowin, "all living beings are

considered someone, not something" [10]. For example, *nibi* is water. Ni is derived from niya meaning "I am" and bi from bimaadiziwin, "a way of life" [57]. Rivers are very old ancestors of the Anishinaabe and like other elders, rivers have rights and require community care [58]. In contrast, English language words like "resources" and "extraction" have no direct translation in Anishinaabemowin, and even "research" is translated to a more active, engaged, and experiential verb: "search" [59].

Anishinaabe ways of knowing what is real on the earth, the fundamental realities of collective Indigenous knowledges, are not "imaginaries" based on "desired futures." While not all Indigneous knowledges are the same, they have more in common with one another than they do with the Western philosophical tradition [56,60,61]. The Anishinaabe hold collective understandings of reality, knowledge of what is real and how humans access knowledge about reality, that suggest fundamentally different directions and priorities for how humans engage in the organization of energy access [10,54,55]. In practice, this may involve leveraging the sovereignty of Tribal Nations to enhance energy sovereignty in ways that provide electricity at a lower cost to diversify the economic activities contributing to Tribal wellbeing [62] or in ways that encourage Tribal independence, training and career opportunities for Tribal youth, and Tribal leadership in addressing climatic change through a renewable energy transition [63]. Energy research and social science based in an Indigenous ontology would involve centering research as a constellation of relationship building practices in pursuit of the restoration of land and the revitalization of life - an approach that we argue below would be more effective than approaches grounded in understanding imaginaries [46,48].

## 4. Honoring pluralistic ontologies in socio-technological system transitions

Pluralistic ontologies matter for broader STS work. Encouraging convergent research that bridges social and technical disciplines, Tribal Nations and non-tribal communities, universities with non-academic sectors, and household scales with community and regional scales, our proposed framework for understanding socio-technological system transitions (STST) argues for recognizing pluralistic ontologies. One way to do so is through transdisciplinary and community-engaged, participatory research [63–65]. Building such relationships of trust and respect is a necessary part of STST and requires acknowledging *gikendaasowin* and the pluralistic ontologies at the foundation of sometimes incompatible knowledges.

The fields of STS and ERSS both have robust histories of interrogating how collective understandings of reality shape scientific knowledge and technological development, and others have clearly identified the ontological rupture between "nature" and "human culture" associated with the Enlightenment as a fundamental and foundational contradiction underlying all the dialectical tensions in science and technological progress [66–68]. Yet we argue that because of the underlying reliance on ontologies based in Western European Enlightenment thinking, research in STS and ERSS maintains research agendas and approaches that fail to question or explicitly address how pluralistic ontologies, including Indigenous ontologies, could inform our engagement as scholars, practitioners, and humans studying energy transitions and the use of energy systems in everyday life.

The concepts of rights, responsibility, relationality, and reciprocity are central to understanding Anishinaabe ontology [10], culturally embedded understandings of the nature of reality that govern both what is known to be true and what it means to live in right relations with the world and all its beings. The discussion of this Anishinaabe ontology highlights how divergent ontologies inform divergent priorities and potentials for decision-making regarding energy and other socio-technological systems transitions. To fully engage with socio-technological system transitions (STST) requires making space to attend to the possibility that multiple and potentially incongruent ontologies may shape what communities know to be real in the world. Attentiveness to plural and potentially incongruent ontologies creates space for more fully and more responsibly incorporating communities in community engaged research and practice. It also suggests novel possibilities and priorities for change that may not be revealed when working from the foundation of Enlightenment dualisms which, along with much thought grounded in settler colonial and colonial thought, are incommensurable with Indigneous thought [28,56].

Scholarship in STS has clearly critiqued the presumptions constructed and perpetuated on the basis of Enlightenment thinking that continue to dominate global ways of knowing, thinking, and acting [17,69]. Yet these critiques have adequately informed research approaches that start with questioning the ontological foundations of both researchers and communities as key considerations to inform decision making, which limits what knowledge is considered relevant to these decisions. Acknowledging pluralistic ontologies can improve ethical community engagement that does not presume to start with a shared or superior understanding of what's real. It can also potentially provide new and novel opportunities for addressing the very real problems created by STST informed by an ontology born out of Enlightenment thinking. Ontological differences perpetuate many of our challenges, and we are merely in the early stages of learning how to address them together.

Scholarship on transdisciplinarity recognizes the importance of having respectful and reciprocal relations regarding interactions across multiple domains of expertise [70–72]. As opposed to theories of "social ontology," which emphasize the creation of new entities (e.g. money, the law, language) out of social groups [73], transdisciplinary research concerns how people from different fields and knowledge traditions can come to work together [71,74]. One prerequisite, we argue, is the recognition that incommensurable ontologies may play a fundamental role in diverse approaches to navigating energy systems decision making.

Convergence approaches practiced by Indigenous scholars and communities have emerged to inform STST and can provide a way forward for broader STS research. Nan Wehipeihana, for instance, has provided Indigenous-centered frameworks for the evaluation of community-engaged and participatory research [75]. Wehipeihana cautions against research done "to Indigenous communities'' or "for Indigenous communities," both of which seem imposed by external entities and ultimately harmful. Instead, she encourages research "with" and "by Indigenous communities'' and "as Indigenous communities." Ultimately, as in STST, our work can aim to support tribal sovereignty and respect relationality only if it recognizes Indigenous ontologies as legitimate *gikendaasowin* that can inform improved understandings of the world and human relations within it.

We therefore recommend recognizing and respecting the possibilities of multiple, pluralistic ontologies, whether working in Indigenous or non-Indigenous communities. For instance, this may require proceeding with research questions grounded in a notion of how energy decisions might impact reciprocal relationality. Similarly, while the concept of imaginaries enables researchers to conceptualize the reality of socially constructed energy systems, recognizing the fundamentality of different ontologies related to energy systems might better provide researchers with deep grounding in respect for different approaches to these systems across communities. Just as an approach grounded in recognizing the reality of Indigenous ontologies assists energy researchers with building the respectful, reciprocal relationships vital to work in Indigenous communities, we argue that this approach similarly prepares them for work with non-Indigenous communities. Imaginaries as a concept

provides explanatory value for understanding collective values and their role in decision making, but energy systems decision making also involves contending with fundamental understandings regarding reality, and these understandings vary across time, place, and culture. Is the nature of human reality to dominate, extract, and consume, or is our reality that of embedded relationships, opportunities for learning, and engagement with sovereign beings across species and landscapes? Embracing pluralistic ontologies and centering ontology in the study of energy social science allows for research that directly explores these ontological foundations and their role in energy decision making.

In the domain of energy research, recognizing plural ontologies means destabilizing what is "known" about energy. This ontological shift to recognizing relationality and sovereignty of all beings in the world can facilitate different choices in renewable energy transitions. This means attending to new relationships, asking new questions, and accessing new answers.

Instead of asking questions about what is efficient, what will be socially accepted by communities or markets, or how access will be distributed, the ontological foundations in the teachings of Anishinaabe as described below encourage us to ask how we are relating to the wind, the water, and the lands in our harvesting of energy and whether our energy systems are designed to respect the sovereignty of all beings on the earth. Instead of seeing the earth as containing resources for human use, energy social scientists can learn from ontologically diverse communities to recognize the reality of reciprocal relationships and the sovereignty of all beings, which will change the nature of the conversations in participatory engagement and ultimately shift decision making in energy transitions. Instead of seeing energy as a commodity to be purchased at a price and a system to be organized to maximize efficiency, energy may become a flow of relationships among human and more-than-human beings, each with their own sovereignty. Instead of seeing the land, air, sun, and water as resources to be extracted or utilized, they become relatives with their own needs from who we can learn and with whom we can enter relationships. As we recognize the legitimacy of Indigenous ontologies for understanding energy, we can ask new questions about how humans relate to the world to meet their needs and comforts, how human needs are constructed (based on what fundamental understanding of reality), and how human needs are balanced with the needs of all our relations.

## 5. Conclusion

The field of STST as we describe it here involves explicit engagement with diverse ways of knowing existing across human groups. Examining differing concepts of desired futures (imaginaries) is not the same as questioning differing foundations regarding the nature of reality, and Indigenous ontologies (here illustrated through Anishinaabe) suggest that the world is bound through reciprocity and respect for sovereignty among human and more-than-human communities. This ontological foundation fundamentally changes what is and what realities are attended to in energy systems decision making.

Scholarship in STS provides a lens for understanding the roles that culture and collectively held social values play in shaping, constraining, and making sense of scientific and technological innovation. As Jasonoff writes, "our sense of how we ought to organize and govern ourselves profoundly influences what we make of nature, society, and the 'real world'" [37]. Yet proactive exploration of the possibilities for technological transition arguably requires digging even deeper into the very foundations of knowledge and collectively understood conceptions of reality.

Ontologies, as the foundational knowledge regarding what is real in the world, vary across time and place. Although ontologies built on the legacy of the Enlightenment may dominate Western scientific practices, plural ontologies exist and thrive among us, in "Western" societies and throughout the world. Ontological foundations, shared understandings of what's real, are not synonymous with cultural or shared ethical understandings of what "ought to be." Ontology instead addresses the very foundation of what is, what's real, and the nature of that reality [76,77].

To engage in ethical transdisciplinary scholarship, scholars in ERSS must acknowledge the potential for incommensurable ontologies and must embrace a willingness to question their own understandings of the nature of reality. As others have acknowledged, "ontology is social, and thus multiple" [78]. Yet recognition of diverse ontologies doesn't necessarily require that attention be centered on empirically researching "ontological politics" [78]; instead, pluralistic ontologies can be observed and respected with the potential for bridging across multiple ways of knowing or perhaps most importantly, for mutual learning across "experts" and "communities" as well as across domains of expertise in convergent research approaches.

The fields of ERSS and STS have provided a rich background for understanding the multitude of ways that society, including cultural understandings and collectively held values and priorities, shape the development of science and technology. Yet this work is largely grounded on a singular ontological foundation, perhaps in part based on the foundations of these fields that continue to shape current assumptions implicitly. A framework for a transdisciplinary, participatory field of STST research involves embracing pluralistic ontologies, particularly Indigenous ontologies. This can guide both research and engagement in energy systems transitions as scholars and decision-makers de-center a singular way of knowing and open the door for allowing themselves to learn new understandings of the nature of reality that prioritize relational sovereignty and respectful reciprocity among all things when making decisions about socio-technological system transitions.

These ontological foundations deserve attention and consideration regarding their role in shaping how communities conceive of and imagine their relations with energy systems and the potential pathways for energy systems transitions. Furthermore, embracing Indigenous ontologies may be key for learning the lessons needed to develop a sustainable and just energy system. The ontologies of the Enlightenment brought us colonialism, extractivism, and the climate crisis. Scholarship continues to rely implicitly on this ontology. In agreement with Indigenous scholar Sākihitowin Awāsis, we believe that for energy social science, "a key concept is ontological pluralism, the co-construction of knowledge based on engagement with multiple knowledge systems. Bridging multiple distinct epistemologies is integral to… challenging colonial extractivism" [10]. Others have also recently acknowledged the potential role of Indigenous ontologies in providing wisdom for healing, restoration, and a return to reciprocal and relational systems of care [79]. Embracing pluralist and Indigenous ontologies in science can build a better world.

## 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.

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## Further reading

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