Putting metrics last: A decolonial feminist approach to evaluating energy justice

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Abstract

Quantitative tools for evaluating energy justice allow users to make quickly comparisons across options. Most of these tools overrepresent distributional justice at the expense of other dimensions that are more difficult to measure (e.g., procedural, recognition, and reparative justice). Although funding, time, and an openness to incorporating qualitative knowledge can overcome these deficiencies, efforts to do so are often undercut by neoliberal commitments to unrelenting growth, with metrics-dominant policymaking on energy justice. Drawing on critical ecofeminist, decolonial, and degrowth perspectives, we offer the concept (and praxis) of "metrics-last" as an alternative approach to the evaluation of environmental and energy justice. The approach makes room for data science, but only as it complements methods that prioritize relational and collaborative information-gathering. Our approach repudiates the epistemic discrimination of *purely* quantitative approaches to energy justice and elaborates a more disruptive set of principles that should be non-negotiable in decision-making processes and taken early. These principles are widely available but are typically sidelined by funding and other institutions because they point toward radically different energy worlds that challenge power and profit. We highlight existing frameworks that are consistent with a "metrics-last" approach in the work of the Molokai Clean Energy Hui, which undertook a deeply community-engaged energy-planning process on the island of Molokai, Hawai‘i from 2021-2023. We illustrate how a metrics-last approach and "moving at the speed of trust" not only engender better energy relations but can also help communities move beyond points of impasse. Embracing slow energy justice—taking time to repair energy relations and refusing the trap of urgency—can lead to better energy outcomes for the communities and ecologies that are affected by these projects.

Keywords: energy justice, ecofeminism, metrics, epistemology

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Résumé

Les outils quantitatifs d'évaluation de la justice énergétique permettent aux utilisateurs de comparer rapidement différentes options. La plupart des outils se concentrent sur la justice distributive, mais moins sur les dimensions plus difficiles à mesurer (par exemple, la justice procédurale, la justice recognitive et réparatrice). Ces problèmes peuvent être surmontés avec plus de temps, de financement et une ouverture à l'utilisation de connaissances qualitatives. Mais les efforts en ce sens sont souvent compromis par des engagements en faveur d'une croissance incessante, de la rapidité et d'une élaboration des politiques dominée par les métriques. Nous utilisons des perspectives écoféministes, décoloniales et de décroissance pour plaider en faveur d'une approche «métriques en dernier recours» dans l'évaluation de la justice environnementale et énergétique. Cette approche utilise des données, mais en complément d'une collecte d'informations relationnelle et collaborative. Nous élaborons un ensemble de principes plus disruptifs et non négociables pour guider une prise de décision juste. Ceux-ci sont largement disponibles et remettent en question les structures existantes du pouvoir et du profit. Une approche « métriques en dernier lieu » est appliquée au travail du Molokai Clean Energy Hui, qui a entrepris un processus de planification énergétique profondément engagé auprès de la communauté sur l'île de Molokai, à Hawaï, de 2021 à 2023. Nous illustrons comment «avancer à la vitesse de la confiance» permet non seulement d'améliorer les relations énergétiques, mais peut également aider les communautés à dépasser certains points d'impasse. Adopter une justice énergétique lente, c'est-à-dire prendre le temps de réparer les relations énergétiques et refuser l'urgence, peut conduire à de meilleurs résultats énergétiques pour les communautés et les écosystèmes touchés par ces projets.

Mots-clés: justice énergétique, écoféminisme, métriques, épistémologie

Resumen

Herramientas cuantitativas para evaluar la justicia energética permiten a los usuarios comparar diferentes opciones. Sin embargo, la mayoría de herramientas no se enfocan en aspectos de la justicia que son difíciles de medir (justicia procesal, justicia de reconocimiento y justicia reparativa). Aún cuando más tiempo, financiación y una mente abierta pueden ayudar, el crecimiento, la rapidez y la dependencia en indicadores para la elaboración de políticas lo dificultan. Por lo tanto, utilizamos perspectivas ecofeministas, decoloniales y de decrecimiento para defender un enfoque de «indicadores en último lugar» en la justicia medioambiental y energética. Nuestro enfoque utiliza datos, pero complementarios a la recopilación de información relacional y colaborativa. El *Molokai Clean Energy Hui* llevó a cabo un proceso de planificación energética profundamente comprometido con la comunidad en la isla de Molokai, Hawái, entre 2021 y 2023. Utilizamos este ejemplo para desarrollar un conjunto de principios disruptivos y no negociables para guiar la toma de decisiones justas. Aplicamos el enfoque de «indicadores en último lugar» para ilustrar cómo «avanzar a la velocidad de la confianza» conduce a mejores relaciones energéticas y ayuda a las comunidades a superar el estancamiento. Adoptar la «justicia energética lenta», tomándose el tiempo necesario para reparar las relaciones energéticas y rechazar el sentido de urgencia, puede conducir a mejores resultados energéticos para las comunidades y las ecologías afectadas por estos proyectos.

Palabras clave: justicia energética, ecofeminismo, métricas, epistemología

1. Introduction

Environmental justice movements have demanded that justice be prioritized in energy transition plans, including in the construction of lower-carbon energy systems like solar and wind. As a result of these efforts, policymakers and communities have turned their attention and resources toward understanding justice in energy development projects, leading to the emergence of a plethora of quantitative indices and scorecards for evaluating the "achievement" of environmental and climate

justice. Notable examples include the World Bank's Regulatory Indicators for Sustainable Energy (RISE); progress-tracking tools for the United Nations' Sustainable Development Goal 7, which relates to energy; the European Union's Transitions Performance Index; and the Justice40 initiative launched by former U.S. President Joe Biden. Most of these evaluation tools rely heavily, if not entirely, upon quantitative data. Metrics and scorecards are ubiquitous to modern life—so much so that the need for numbers to track improvement feels like common sense. Numerical data allow users to make comparisons across options quickly and to simplify highly complex policy processes. However, as other energy justice scholars have pointed out (e.g. Baker *et al.*, 2023), most of the metrics used in these scorecards reflect a narrow and incomplete understanding of justice, focusing heavily on distributional justice, which—within the energy development realm—means ensuring equity in the allocation of burdens and benefits of energy infrastructure and policies.

But environmental justice means more than creating equity in the distribution of burdens and benefits (e.g. Sovacool *et al.,* 2023; Dunlap & Tornel, 2023; Castillo Jara & Bruns, 2022). It also requires that the perspectives of subordinated and historically marginalized groups are valued and centered in decision-making (recognition justice); that affected residents have the structural ability to influence decision-making—not simply that they have opportunities to express their opinions about policies or development plans (procedural justice); that past harms against marginalized groups are acknowledged, leading to efforts to correct those harms (reparative justice), and that the political and economic structures that have caused, and that continue to cause, harms are altered (transformative justice). Moreover, energy justice can involve a consideration of nonhumans as important members of ecological communities, and as deserving of rights and justice (ecocentric justice[2]). Finally, these dimensions of justice are also relevant across the global networks involved in extracting, processing, transporting, consuming, and disposing of fuel and fuel technologies (transnational justice).

These many dimensions of justice are not easily captured through quantitative measures, and they are often sidelined in policy evaluations of environmental, climate, and energy justice. Indeed, Baker *et al.* (2023) acknowledge this quantitative bias in energy justice metrics, noting that the more qualitative aspects of justice—those aspects that can only truly be understood through taking into account the lived experiences of affected people—are "inherently difficult to measure," and that collecting this type of qualitative data can also be "time-consuming, expensive, subjective, or hard to replicate." They offer that some of these difficulties can be surmounted with "sustained and consistent funding" or "with a system that prioritizes relationship building and [that] acknowledges the time required to do so" (Baker *et al.*, pp. 753-754). However, these resources—sustained funding and time for building relationships—are difficult to come by in a neoliberal context oriented toward progress narratives and unrelenting economic growth.

The difficulties have only intensified in the U.S., where we have lived and worked. The Trump Administration has aggressively thwarted research endeavors that contradict its pro-fossil fuel agenda, including halting federal collection of data on not only environmental justice, but also greenhouse gas emissions, weather disasters, and drought conditions. With climate and environmental data disappearing from U.S. government websites, it may seem a strange time to write an article that criticizes the dominance of quantitative measurement. We contend, however, that such a critique is needed now more than ever. Many scientists are calling for people to 'trust science,' but a blanket defense of science does not make space for much-needed self-reflection, especially about the troubling relationships between scientific research and corporate money. In the case of energy, for

[2] Ecocentric justice would radically disrupt Western, anthropocentric political systems, and there are already efforts underway, including some rights for nature implemented in 24 countries and more than 60 cities and counties in the U.S. (see also the More than Human Rights [Moth] project).

example, oil companies have been major funders for climate and energy institutes at prestigious universities like Stanford, MIT, and Princeton, where university officials have insisted that oil money does not influence the objective nature of their research (Hiltner *et al*., 2023). The dominance of metrics, as part of neoliberal ideology, helps to obfuscate corporate influence, as we explain below. Instead of being for or against data science, then, we argue for a more nuanced position that grapples with the crisis of scientific authority under late capitalism. We want to defend environmental data collection, but without returning to a neoliberal default in which metrics dominate—and oftentimes erase—other ways of knowing.

Metrics are not neutral tools that describe the world, though they claim to represent universal, objective knowledge. Metrics communicate the messy, sensorial world and its myriad relations through "standardized forms of measurement, representation, and expressions of value," usually in the form of numbers (Loconto *et al.*, 2024, p.3). Scorecards combine many metrics, often making choices about how to weigh a set of indicators to provide an overarching, simplified view of a complex phenomenon. Feminist data scientists Catherine D'Ignazio and Lauren Klein (2020) stress the point that metrics selectively reflect the world, rather than directly representing a phenomenon, arguing that "[d]ata, after all, is information made *tractable*" (p. 103). When used for governance, metrics also *change* the world, in that people orient their actions toward that which is being measured. In other words, by selecting what to count, metrics also reflect *what* counts: as progress, value, or sustainability. Other ways of gathering and interpreting data often seem less "actionable" than indices that translate complex lifeworlds into numbers and that track change mathematically.

This "epistemic discrimination" in favor of quantitative modeling (Dunlap 2022, p. 343) often rules out feminist, decolonial, anti-racist, queer, and Indigenous perspectives, as these epistemologies typically draw upon qualitative and humanistic methods, including historical, narrative, interpretive, ethnographic, activist, and traditional ecological knowledges. Epistemic discrimination has significant consequences. Justice efforts that discriminate against other kinds of knowledge have already performed an injustice in advance, in the sense of limiting who and what can be represented by their scorecards.[3]

Moreover, the overemphasis on metrics may explain why distributional aspects of justice receive the most attention in energy projects: it is easier to measure facets of distributional justice, such as harms and benefits. More insidious, though, is the reality that the ecocidal status quo can conceivably continue alongside distributional justice efforts. For example, ecofeminist Val Plumwood points to the "uncritical equality" sought by liberal feminists—and some socialists and green theorists, too—which focuses mainly on redistributing the benefits of the existing system. Without challenging what Plumwood calls the "master model" of the human, such moves risk a "broadening of the dominating class, without the basis of domination itself being challenged" (p. 29).

Focusing on distributive justice does not often lead to challenging the master model that Plumwood describes. Other dimensions of justice, which are often harder to translate into numbers, promise to be more disruptive. When other kinds of knowledge are sidelined in a scorecard, it may not be because they are too difficult to measure, or too costly to gather (making metrics is also difficult and costly), but because they could point toward radically different alternatives that challenge existing structures of power and profit.

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[3] Following D'Ignazio and Klein's work in Data Feminism (2020), we likewise employ intersectional feminism to "[ask] uncomfortable questions" of the data status quo, examining "how privilege is baked into our data practices and our data products" (p. 26). For these authors, data feminism is a "goal and a process," one that takes a stand against the inequitable status quo and that recognizes that "there are always … problems that cannot be represented–or addressed–by data alone" (p. 10).

In this article we make the case against the accumulation of metrics in energy justice projects, pointing to the historical entanglement of metrics, scorecards, and extractive systems of growth. We propose a "metrics-last" approach (in contrast to one of "metrics-dominant") that incorporates holistic understandings of justice into the design and evaluation of energy projects and that engages a healthy feminist suspicion of the metrification of life (Nelson, 2015; Murphy, 2017). The process of making decisions about how to evaluate justice should be understood not as a preliminary accomplishment for experts, but as an early and non-negotiable step in ensuring that transitions are just in a more transformational sense.

Rather than dismiss quantitative methods outright, we take a critical ecofeminist approach to knowledge making. "Putting metrics last" means that quantitative data enter the picture after democratic, justice-seeking processes are underway, when metrics may be collected in service to the specific goals and questions of affected communities. Metrics appear *after* key questions have been discussed: for whom and for what are metrics being used, and are they the right way to know this problem? "Metrics last" also means that metrics are used strategically rather than by default. In each case, quantitative data may be used if stakeholders decide that it is the best way to answer a question, or to communicate a finding with a certain audience (e.g. with funders, the state, or as a public advocacy campaign), rather than assuming from the start that numerical data is always preferred or superior.

We have also tried to resist the professional pressure to create our own novel energy justice scorecard for this article—an accumulation of knowledge that we feel is unnecessary. The problem is not a lack of ideas, but the obstacles preventing these ideas from taking root and flourishing. There are already many scholars, institutes, and communities—several of whom we will discuss below—doing the work of "metrics last" in their energy planning, although they do not always win as much attention or funding. The concept of "metrics last" is not intended to be a new framework, but rather a way to highlight a consistent pattern in these alternative, resistant approaches—a pattern of epistemological pluralism that is fundamentally at odds with the dominant, "metrics-first" tendency. "Metrics last" offers an easy mnemonic, a shorthand that can serve as a call, a demand, and a pushback when state agencies, investors, and utilities pursue projects on the basis of "metrics dominant," where the desire to show measurable change can end up leading the policy, whether the preferred metrics are fuel cost, tax income, job creation, or carbon emissions.

In the article, we draw on the work of political ecologists and other scholars who demonstrate how narratives of rationality, objectivity, and numerical literacy help to stabilize ideologies of human supremacy. We also draw attention to the scholars and communities who are already putting metrics last in energy justice thinking and action, revealing what can be made possible by moving beyond the hegemony of metrics. We conclude our article by reflecting on the difficulty of instituting a "metrics last" approach in concert with powerful sites, like the state, utilities, and energy investors, and we grapple with the twin pressures of urgency and scaling-up in energy justice efforts.

2. The metrification of ecology

The widespread use of metrics and scorecards is an effect of the economization of modern life (Murphy, 2017), which has especially intensified since the late 1970s with the rise of neoliberal approaches to governing populations. Neoliberalism, in its many guises, prizes individualism and market competition, and its values—quantifiable growth, improvement, competition—have infused modern cultures (Connell & Dados, 2014). Measurement, stored in data infrastructure and accelerated to make "Big Data," is "increasingly woven into almost all aspects of our daily activities," while the

values and political judgments that went into designing those measurement systems usually operate invisibly (Pine & Liboiron 2015, p. 8).

The use of metrics intensified with neoliberalism, but there is a longer history of metrics that reveals how they are tightly connected to the status quo of extractive growth. Governance by data collection exploded during the late nineteenth century's acceleration of fossil-fueled capitalism. State agencies, imperial managers, and corporations began to rely much more heavily on quantifiable measurements for decision making. An "information society" emerged, in which the Victorian imperial state dreamed of "a kind of complete documentary knowledge of human life that would exist solely for the state," and leaned heavily upon Western scientific approaches to make sense of it (Richards 1993, p. 74).

In this same period, the concept of the scorecard appeared, to organize the growing collections of data and metrics. Scorecards were originally used to track sports games, but by the early 20th century, they had become tools for governments to regulate industry according to emerging and so-called scientific standards. The U.S. Department of Agriculture created some prominent early examples, such as the dairy scorecard, an attempt to regulate the sanitation of dairy farms by collecting data about key practices. In the 1950s, the finance industry began to use scorecards to provide standardized ratings to predict a person's default risk. The credit score helped to obscure racist and sexist inequities and biases by its seeming quantitative objectivity (Friedline *et al*., 2024). In the 1980s, corporate managers who were unhappy relying only upon financial metrics began to develop "balanced scorecards" to track company performance, with the goal of including more difficult-to-measure elements like corporate learning and customer satisfaction.

All these cases represent efforts to capture complex phenomena—and especially non-numerical knowledge, such as trustworthiness, learning, or interpersonal relations—with metrics, to better control and regulate. In many of these cases, any perceived defects of scorecards have been met by calls for more and better metrics. Data is usually called upon to correct their deficiencies, rather than inspiring a deeper reflection about the limits of data as a tool of governance.

The same trends have been evident in environmental and energy governance, which follows the urge to quantify nature to provide accountability, regulation, and management (see for example two special issues of *Science as Culture*, "Environmental governance through metrics," in 2024, and "Counting on nature," in 2017). The pursuit of energy and environmental justice through scorecards combines elements that seem easy to measure, like the percentage of people with reliable electricity, food, or water, with dimensions that are not, like democratic processes, or the social structures that lead to disproportionate harm by race, class, and gender. But the difficulty of measuring justice has not dissuaded the drive to metrification.

At the same time, the "promise of measurement" has arguably failed to deliver the action or regulation that it means to provoke. While studying pollution in an Aotearoa[4] waterway, environmental geographer Marc Tadaki (2024) writes that "despite decades of investment into environmental measurement, many things we care about and have measured for decades—global carbon dioxide concentrations, biodiversity, soil carbon, forest area, marine fisheries—are heading in worrying directions," and this "should give us pause" (p. 1648). And yet the response to many such failures is to collect more data, with the premise that more data will lead to political and economic change. There is always more data to collect, without end.

[4] Aotearoa is the Māori place name for New Zealand. See https://www.waikato.ac.nz/int/news-events/news/putting-aotearoa-on-the-map-new-zealand-has-changed-its-name-before-why-not-again/ for further discussion.

The drive to metrics also has an emotional payoff: Tadaki (2024) observes that "the promise of measurement remains alluring because it focuses on the benefits of knowledge while the costs and dilemmas of producing desired environmental changes remain out of frame" (p. 1665). Metrics tend to neglect the difficult political and economic struggles that are actually causing ecological problems. This led one scientist working for an Aotearoa regional water authority to complain to Tadaki that "some people would prefer more science than have nice water quality" (Tadaki 2024, p.1665).

The limits of metrics in energy justice

There is nothing inherently wrong with translating some aspects of the world into numbers, and metrics can be powerful tools for catalyzing community mobilization and citizen empowerment. Metrics become a problem, however, when they are accorded higher value as knowledge, when they exclude or discredit other knowledge, and when they are considered to be separate from the world they measure—to have achieved an objective distance that is nonpolitical.

New scorecards have multiplied in response to the demand for climate and energy justice and are particularly popular among banks, investors, and governments. The fully quantitative scorecards function like an index, similar to a stock market index or the GDP, which gathers together different quantitative measurements into one overarching score or evaluative tool. The World Bank's Regulatory Indicators for Sustainable Energy (RISE) is one such index, and its metrics attempt to install a universal model for energy development, based on neoliberal ideologies. Other examples include: the European Union's Transitions Performance Index; progress tracking tools for the United Nations' Sustainable Development Goal 7, which relates to energy; and the Justice40 Initiative implemented in the United States under the Biden Administration, which was focused on a distributional goal of having "40 percent of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution."[5] The index style prizes positivist knowledge that can be measured, whether through numerical indicators, like pollution or income, or by asking questions with yes/no scores or rating scales.

An examination of these scorecards highlights a key insight made by D'Ignazio and Klein (2020), who argue that "false binaries and implied hierarchies" can often be found "lurking under the surface of…many classification systems" (p. 105). A wide array of uncontested assumptions are held stable, and much is ignored, when energy justice is evaluated through quantitative measures alone. While not an exhaustive list, some of the assumptions about the world that are typically bracketed, overlooked, or accepted as indisputable in energy justice scorecards are noted in Table 1. Although each of these assertions could be contested, they are treated as immutable facts when "baked in" to justice scorecard metrics. In holding these assumptions constant, more radical transformation pathways—that may lead to more just outcomes—are ruled out in advance.

One can use metrics alongside other ways of knowing, and yet more typically, in energy policy making, metrics are a universalizing and all-powerful epistemology, one that only tolerates other approaches on the margins. "Once a system is in place, it becomes naturalized," as D'Ignazio and Klein argue, so that "we don't question how our classification systems are constructed, what values or judgments might be encoded into them, or why they were thought up in the first place" (2020, p. 104).

[5] https://web.archive.org/web/20220926094047/https://www.whitehouse.gov/environmentaljustice/justice40 (archived, original page now removed)

- Endless energy and economic growth are both feasible and desirable on a planet with finite resources.
- Nature is a resource that is external to human life.
- People are individual "users" or "consumers" of nature.
- "Agency" is understood within a consumer framework: people should "vote with their dollars."
- Considerations of the nonhuman world do not belong in assessments of justice.
- Households are understood to be nuclear (often heterosexual) families.
- Work only equates to paid jobs, not to reproductive or care work.
- Fossil fuel influence and use is often not acknowledged as present in lower-carbon energy projects (e.g. nuclear, wind, solar).
- The state is viewed as a neutral entity that operates independently of corporations.
- Property is inalienable (except in the case of "necessary" energy development projects that are granted the right to use eminent domain).
- Energy development projects must be profitable and attractive to investors in order to be worthwhile.
- Militarism and war are deemed irrelevant to the climate metrics applied to corporations and states that build, sell, and use military technologies, despite the massive ecological impacts of weapons, vehicles, and the lifeworld destruction that is attendant to warfare.
- Projects must happen as quickly as possible, creating an "urgency trap" in which the gravity of the climate crisis is used to rule out alternative approaches that challenge the capitalist status-quo.

Table 1: Unchallenged assumptions in many quantitative measures of justice.

Moreover, metrics also run the risk of minimizing community engagement. For urban planning scholar Theodore Lim, who investigates urban heat resilience in Southwest Virginia in the U.S., "deep community engagement" is integral to "reveal[ing] the nature" (2023, p. 568) of energy and climate justice problems that disproportionately impact marginalized communities. He further argues that "reparative planning" (2023, p. 568) must accompany such engagement, offering the example of Black residents of Roanoke, Virginia, whose extreme distrust of the primarily white city government negatively affected their participation in projects designed to cool some of the hotter parts of the city. Tree planting, for example, carried out with the intention of providing greater shade canopy and carbon dioxide absorption, was resisted by some community members who wondered about who would bear the maintenance cost and labor: "[B]ranch removal, leaf raking and disposal, and damage to homes and cars from falling branches … was a financial burden on residents" that they did not feel inclined to bear. Such mistrust can be difficult to measure but can nevertheless fundamentally shape the metrics gathered from a community; non-participation can be measured, but without the deep engagement called for, the reasons for this non-engagement remain obscure.

Thus, the pursuit of justice, which challenges existing power relations, requires other styles of evaluation, a "metrics-last" approach.

An ecofeminist reflection on metrics

The belief that more data is always a good thing mirrors the troubling premise of modern energy regimes—that more energy is always a good thing. On a material level, data accumulation has significant environmental and energy costs that tend to be accepted as necessary; sometimes data advocates justify data accumulation by arguing that more data will solve environmental problems. In addition to the material limits on data, there is also a troubling ideological relationship between the metrification of nature and the ecocidal status quo, one that suggests that the metrification of nature is not politically neutral.

Ecofeminists have long noticed this deeper relationship. The bias toward metrics operates through binary thinking, one that values a simple, supposedly objective dataset over the messy world and creates the separate categories of quantitative versus qualitative data, the first defined over and against the other. Thirty years ago, Val Plumwood observed that Western thought is organized around such binary thinking, where the binary sets up a hierarchy that values one side through the subordination of the other; key binaries include nature-culture, civilization-savagery, work-waste, man-woman, white-black, straight-queer, and pure-polluted. Binaries "are not just freefloating systems of ideas," Plumwood contends, but are interconnected into a master model; they work together to uphold "domination and accumulation, and are their major cultural expressions and justifications" (Plumwood 1993, pp. 42-43). That master model is not only about masculine domination, but also about "class, race, and species supremacy" (p. 28).

With modern science and metrics on the side of reason, other ways of knowing are discounted as primitive, embodied, particular, and emotional, including feminist, Indigenous, non-Western, disabled, and ecocentric ways of knowing and understanding and of doing politics. These ways of knowing do not always think with numbers—they can even resist numeration, given the state's historical interest in (ac)counting and surveillance through data.

Indeed, metrics have often partnered with efforts to control and make order, to simplify the complexity of nature. Ecofeminist Catherine Keller connected the modern scientific pursuit to assert order in nature to an older, theological one, a "drive to transcendent unity" that is a "profound impetus in all patriarchal spirituality," which honors a transcendent, universal Creator, who not only stands outside of nature but also *commands* it (1990, p. 257). Nature is often represented as feminine and watery chaos, "the oceanic womb of life," where relations are inherently complex (1990, p. 256). The imperial version of patriarchal religion that Keller describes leaves little room for the pluralism of the world, where women and feminized people have historically been assigned as the caretakers of relations.

Keller shows the continuities between this belief system and the ecocidal politics of today, wherein the "vision of endless progress" is enacted through "endless exploitation" and the eradication of entanglements (1990, p. 225). Keller's study of the world-ending pursuit of “cosmic minimalism” is chilling, in that it shows how the dominance of metrics, which feels so cool and objective, can help to roll out bloody ecocidal projects, even when its stated intention is the opposite. When there is no place for complexity and relations on a scorecard, this also reflects a politics where there is no place for that complexity on Earth—as the drive to universal transcendence "always achieves its ends at the expense of nature and multiplicity" (1990, pp. 256-257).

This is something more than making the world in the image of one's chosen metrics, where actors come to prioritize those things that are being measured. This is making the world in the image of the *aesthetics* of metrics—a world of fewer relations and complications, a world that is easier to count. In contrast to transcendental unity and simplicity, Keller insists that "to relate is to complicate," to honor the inherent complexity of life and its interconnectedness (1990, p. 257).

Putting metrics last

A critical ecofeminist approach to energy is one that aims for better energy relations, not just better fuel. Better relations cannot be adequately known or realized through counting.

Given the violence of binary thinking, putting metrics last means stepping outside the quant-qual binary, and aiming for a more fundamental destabilization. "Last" is meant to generate new ideas about using metrics, putting them in service to other agents. Instead of a binary that sets up a value hierarchy, a "metrics-last" approach foregrounds how so-called quantitative measures and qualitative context are entangled. Numbers emerge out of messy, embodied, sensory experiences of the world. Numbers also act upon that world. Each type of data is altered by the other in their co-mingling.

Although this approach privileges non-numeric understandings, it holds space for feminist and anticolonial practices of quantitative measurement. As Pine and Liboiron (2015) argue, quantitative methods, metrics, and so-called "big data" can be politically useful, "given th[e] link between [quantitative] data and action" (p. 3147). D'Ignazio and Klein (2020) agree, arguing not only that "what gets counted, counts" (pp. 97-123; see also Criado Perez, 2019), but that quantification—when oriented around reconfiguring inequitable power relations—can be a feminist and liberatory practice. For example, in the case of renewable energy planning on the island of Molokai, Hawai‘i, which we describe below, the community asked the energy developer to report their expected profit margins from the project, making the commodification of energy for private investors into a political matter, and making visible something that had been otherwise opaque and difficult to contest.

"Metrics last" also means taking on feminist insights about knowledge and expertise: most especially partiality, pluralism, and humility. The concept of partiality maintains that interpretations of the world are inherently influenced by social location, and by the differing capacities and memories of our sensing bodies. Our gender, race, ethnicity, class, sexuality, ability status, position in the world system, age, and various life experiences act as lenses through which we all filter information and observations, offering an incomplete view of the world. So too do our sensing organs, whether they are in leaves, roots, whiskers, or gut bacteria. But this is not an incompleteness to be overcome by technology, to be compiled into a universalizable knowledge; rather, partiality is inherent to human knowledge-making. By virtue of its incompleteness, partial knowing implicitly calls for collaboration (Haraway, 1988; Chen, 2023). As the antithesis of omniscience, partiality invokes a kind of humility—a way of relating with, rather than correcting or completing, other points of view. There is always more to learn, but there is also much that cannot be known by everyone, everywhere, in the same way.

3. Model approaches to metrics-last evaluation

The affective appeal of numbers and graphs makes scorecards difficult to contest. Time and again, critical voices are asked to create alternatives, and yet in many cases, those alternative ideas and frameworks already exist. The problem is not necessarily the need for more ideas, but the need to understand the obstacles that prevent these ideas from taking root. There is still an overwhelming preference for quantitative data among the most powerful funders and policymakers. Scorecards dominate not because there are no alternatives, but because scorecards are deemed preferable to the alternatives that exist. This begs the question: who and what are scorecards for?

In the sections that follow, we highlight several scholars and communities who are innovating energy justice approaches that put metrics last, demonstrating what is possible when evaluative tools are reimagined to prioritize more collaborative information-gathering procedures.

The Energy Equity Project and Community Renewable Energy Ecologies (CREE)

The Energy Equity Project at the University of Michigan is a multi- and interdisciplinary team of scholars who argue that while some aspects of justice might lend themselves to metrics—especially distributive justice—a holistic approach to justice cannot be reduced to scorecards. As Justin Schott found after considering existing energy equity metrics, quantitative data can be important for working toward justice, but "metrics aren't enough" to secure energy equity (2022, p. 30).

To create the Energy Equity Framework, which is *not* a scorecard, Schott and his colleagues brought together scholars, community members, utility companies, and policymakers to evaluate 148 potential metrics that are used to measure energy equity. They asked critical questions about each metric that are rarely asked of data, such as whether and why it should be used, for whom it should be used, with whom it should be shared, and who is measuring it. In the end, they kept only 29 metrics, finding that "the vast majority (87%) of potential metrics do not currently lend themselves to rigorous and consistent quantitative measurement" (2022, p. 30).

Then, rather than calling for more and better data across the board, they took a nuanced approach. Some quantitative data is lacking and would be important, they agreed, such as the rate that utility shut-offs occur by race. They found that metrics are especially useful for identifying communities that suffer disproportionate harms, and distributing better resources to them. On the other hand, they concluded that other justice dimensions are ill-suited for metrics. Schott writes,

> [M]etrics won't … address concerns of procedural and restorative justice or the fundamental need to ensure that those most impacted by energy system and climate impacts have prominent seats at the decision-making table. Metrics won't ensure that we are holistically considering utility accountability, community-owned energy generation and storage, or the importance of centering Indigenous communities and sovereignty in the future of our energy system (2022, p. 31).

Instead, for those dimensions, they built a framework of best practices and qualitative, open-ended questions. The end result of their Energy Equity Framework cannot produce scores for quickly comparing projects, like a traditional scorecard would, and yet it does help provide structured information for a more just process of energy transition.

Another example of a metrics-last approach is the Community Renewable Energy Ecologies (CREE) framework, proposed by political ecologist Zoi Cristina Siamanta in this Journal (2021). CREE is "an alternative affirmative framework" that builds on the feminist and post-capitalist community economies approach of J. K. Gibson-Graham (1996, 2006). CREE includes a set of five ethical coordinates around which communities who are evaluating energy projects can organize their thinking (see Table 2):

- Impacts
- Survival/Consumption
- Commons/Encounters
- Commoning/Transactions/Investment; and
- Surplus/Support.

Type	Category	Coordinates/Examples
Community economies	**Survival**	What do we really need to survive well? How do we balance on our survival needs and well-being with the well-being of others and the planet?
	Commons	What do we share with human and non-human others? How do we maintain, replenish, and growth this natural and cultural commons?
	Consumption	What do we really need to consume? How do we consume sustainably and justly?
	Transactions	How do we secure the things we cannot produce ourselves? How do we conduct ethical encounters with human and non-human others in these transactions?
	Investment	What do we do with stored wealth? How do we invest this wealth for future generations to live well?
	Surplus	What is left after our survival needs have been met? How do we distribute this surplus to enrich social and environmental health?
CREE	**Impacts**	How does our energy consumption and other consumptive practices that need energy and resources (e.g. on technology) impact on the climate, humans and earth others?
		Examples: Consider impacts on the climate, human health and 'earth others' from conventional energy production. Consider impacts of RE projects on local groups/individuals (e.g. land grabbing, loss of livelihoods). Consider labor realities in manufacturing RE technologies.
	Survival/ Consumption	How much energy, and what quality and quantity of products, do we really need to consume to live a fulfilled life and flourish along with human and 'earth others'? Do we need to scale up RE production or to scale down energy consumption?
		Example: Consider rethinking specific choices on energy and product consumption for reducing aforementioned impacts.
	Commons/ Encounters	What encounters between humans and between humans and more-than-humans are found in CRE within/across places, (time)scales and the value chain?
		Examples: Consider impacts on 'earth others' from natural resource extraction for manufacturing wind turbines and solar panels (e.g. cobalt, rare earth minerals, oil). Consider exploitive/slave labor for resource extraction and e-waste handling. Consider unequal power relations within and in relation to communities engaged in CRE and procedural/distributive justice.
	Commoning/ Transactions /Investment	How can we (creatively) produce the energy we (wish to) consume, making these encounters more just and reproducing (our) life's material and non-material aspects? What praxes can we engage in for commoning RE, whilst 'becoming-in-common'?
		Examples: Consider small RE prosumption projects for reduced energy consumption and resource extraction, collectively created, shared and managed. Consider more just technologies.
	Surplus/ Support	How can our RE producing activities actively support economies and ecologies with alternative ethical orientations and influence collective ethico-political decision-making for other economic activities and in other domains?
		Examples: Consider financial support to, or alliances with, other community economies, and informative events on CREE for the wider public.

Table 2: Ethical coordinates for CREE as articulated by Siamanta 2021. CC BY 4.0.[6]

[6] Zoi Cristina Siamanta. (2021). Conceptualizing alternatives to contemporary renewable energy development: Community renewable energy ecologies (CREE). *Journal of Political Ecology*, 8(1): 47-69. https://journals.librarypublishing.arizona.edu/jpe/article/id/2297/.

The CREE model aligns with community economies that are engaged in small-scale energy "prosumption" (production and consumption) or in medium-scale renewable energy prosumption and sale, and that are organized around—or at least open to—alternative modes of cooperation, solidarity, egalitarianism, and kinship (e.g. community grids). For Siamanta, this framework compels participants and community members to "rethink how to be humans" (p. 59) by "re-socialis[ing] economic relations … and recognising the interdependence of subjects and economic practices" (p. 56). This also matters for how energy is understood: not as an abstract ability to do work—which we could count—but as an aspect of complex ecological relations that are full of affect and care.

CREE can reflect and draw on socioeconomic relations—including "kinship and intimate relations between humans and more-than-humans" (p. 59)—that exist, but are either unrecognized or hidden by individualist and growth-oriented economic frameworks. By centering community and energy *relations*, and by marginalizing market logics in favor of interdependent and care-filled commoning, 'other worlds' can be enacted, worlds that are oriented around distinct ethico-political ontologies.

The Energy Equity Project and CREE are just two recent frameworks that de-center metrics. As we argued above, there are other groups who share this approach, often in the name of energy justice and energy sovereignty, including the Queremos Sol movements in Puerto Rico, civil society groups who are fighting green extractivism in Tunisia, and Lim's projects with urban heat mentioned above. They do not need more theoretical or methodological ideation to come into being. The Molokai, Hawai‘i-based energy coalition that we describe in more detail below engaged in a similar set of processes, including—but actively de-centering—the reductively quantitative dimensions of their data. Our discussion of Molokai reflects our gratitude for their work, and we showcase this community so that others can learn from them as we did.

Enacting a place-based feminist energy systems approach to planning in Molokai[7], Hawai‘i

In March 2021, approximately six months after we published our article, "Toward feminist energy systems: Why adding women and solar panels is not enough" (Bell, Daggett, & Labuski, 2020), we received an email from Layla Kilolu, Sébastien Selarque, and Ryan Neville—three graduate student-practitioners in Hawai‘i who were interested in "apply[ing] the feminist energy systems framework[8] to a budding opportunity on the island of Molokai," a rural island with electricity

[7] Readers may note that some sources use an ‘*okina* in the name of the island Molokai (Moloka‘i). There are in fact multiple practices that exist among the people of Molokai/Moloka‘i, where the use of the ‘*okina* varies across people and situations. In this article, we follow the convention of the community-based organizations we cite, who usually do not include an ‘*okina* in the name of the island in written texts or in the names of their organizations.

[8] The Feminist Energy Systems framework (Bell, Daggett, & Labuski, 2020) articulates an approach to designing energy systems that centers environmental justice across the lifecycle, from the planning phases to decommissioning practices. The framework is organized around four central coordinates: political, economic, socio-ecological, and technical. The vision for justice in the *political dimension* is an energy system that is democratic, decolonial, decentralized, pluralist, and public. The vision for justice in the *economic dimension* is an energy system that "prioritizes human and more-than-human well-being and biodiversity over profit, refuses the growth imperative, [and that is] committed to community economies and pink-collar or care-work jobs" (p. 3). Justice within the *socio-ecological dimension* is an energy system that is "relational, transparent, attuned to the violence of energy production" and which is "engaged in efforts to mitigate or compensate for that violence" throughout the full lifecycle of energy production (p. 7). The vision for justice in the *technological dimension* is a decentralized energy system that is community-directed and heterogeneous, "developed in collaboration with the communities it seeks to serve," and oriented toward the economic, political, and ecological particularities of those communities (p. 8).

costs that are "among the highest in the state and country," due in large part to aging energy infrastructure and residents' reliance on imported fossil fuels (Kilolu, Selarque, & Chow, 2023). Enrolled at the time in a class called "Smart Grids and Renewable Energy Integration," these three scholar-practitioners—an engineer, a utility professional, and an urban planner—were working with an already-established group of residents and local stakeholders, including the Hoʻāhu Energy Cooperative and Leilani Chow with the Molokai Clean Energy Hui, to cultivate greater energy sovereignty on Molokai.

More than 60 percent of the population of Molokai is *kānaka maoli* (Native Hawaiian), and the "reciprocal subsistence lifestyle" practiced by local residents centers around the Indigenous values of *aloha ʻāina* (love of the land), *kuleana* (responsibility), and *pono* (equity/balance/righteousness)[9], values that are also taught to residents of Molokai who are not *kānaka maoli* (Kilolu, Selarque, & Chow, 2023). These values have not typically been incorporated into formal planning processes, however, which have historically been top-town and exclusionary, leading to "a general lack of trust toward energy planning processes" (Kilolu, Selarque, & Chow, 2023). This history of energy disenfranchisement has led to "a track record of failed renewable energy proposals from outside developers, largely… lack[ing] community benefits" (Cluett Pactol, 2022).

Over the years, local residents have organized extensively to mobilize against developers whose projects did not prioritize cultural values and local modes of well-being. Following the sound rejection in 2013 of an inter-island "Big Wind" project that would have, among other disruptions, buried high voltage cables beneath a whale sanctuary and pristine coral reef and covered 17 square miles (44 km^2) of the island with massive wind turbines, a grassroots initiative emerged to proactively cultivate a resident-led energy sovereignty plan that could be shared with prospective energy developers (Cluett Pactol, 2012; Kilolu, Selarque, & Chow, 2023). This initiative generated a number of smaller organizations and community-led coalitions, most notably Hoʻāhu Energy Cooperative Molokai and the Molokai Clean Energy Hui, both of which were formed in 2020 with the vision of energy sovereignty on Molokai and a "shared goal for holistic community-led energy planning" (Kilolu, Selarque, & Chow 2023, p. 4). Hoʻāhu Energy Cooperative Molokai, the organization with which Kilolu, Selarque, and Neville began their work, was formed to proactively guide the community through a process of co-designing community-owned renewable energy, while the Molokai Clean Energy Hui was a "group of community members inspired to build on [the island's] history of energy advocacy" to "listen, educate, collect and organize [the] community voice" (MCEH, 2023, 10).[10] Guiding principles of the Hui, to which the students were also committed and which they saw reflected in the Feminist Energy Systems model, included "Go slow to go fast," "Be transparent and accountable," "Meet the community where they're at, and do it early and often," and "Have something for everyone" (MCEH, 2023, p. 36).

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[9] The "functional definition[s]/action-oriented translation[s]" for these values, as articulated in the Molokai Community Energy Resilience Action Plan are: ***Aloha ʻāina*:** "Individual and collective actions that improve the physical health and advancement of *Kānaka* (Hawaiʻi people) and *ʻāina* (land) through the fierce protection of resources and unwavering prioritization of culturally based stewardship of *ʻāina*. (MCEH, 2023, p. 21). ***Kuleana**:* "An understanding and commitment to the active responsibility each individual, group, peoples, etc. has to their community and *ʻāina* (land)" (MCEH, 2023, p. 21). ***Pono**:* "A community-led cultural value-based system of evaluating and adjusting decisions and actions to ensure they cultivate aloha *ʻāina* and achieve community consent (MCEH, 2023, p. 21).

[10] This section is a brief synopsis of community energy work in Molokai that has been going on for over a decade. Interested readers should consult Catherine Cluett Pactol's excellent reporting in *The Molokai Dispatch* (https://themolokaidispatch.com/) for a far richer education about this history (and the present). We are grateful to Layla Kilolu, Sébastien Selarque, and Ryan Neville for introducing us to the vital energy sovereignty work in which this community is engaged.

The Hoʻāhu Energy Cooperative Molokai had tasked our colleagues with creating an evaluation tool[11] for assessing potential renewable energy projects, one that was both "more reflective of the … community" and that could "make space for invaluable conversations around *aloha ʻāina*, *kuleana*, and *pono*" (Kilolu, Selarque, & Chow, 2023, p. 4). When they contacted us, Kilolu, Selarque, and Neville were helping guide the community through a participatory process of creating this renewable energy evaluation tool. Perhaps unsurprisingly, our very first conversation with these new colleagues involved metrics. Well aware that "the current energy system's metrics [were] not holistic in nature, … often based [solely] on quantifiable costs, . . . [and uninformed by] community or environmental benefits" (Kilolu, Selarque, & Chow, 2023, p. 4), our colleagues and the community members with whom they worked set about devising a tool that could reverse this equation. The intention was for this tool to be used by planners, researchers, and community leaders to help them evaluate possible renewable energy projects, and by energy developers to help them understand the deep community engagement work that would need to be done *before* approaching Molokai residents with a proposal for an energy project.

Although the three scholar-practitioners with whom we were in conversation appreciated how the Feminist Energy Systems model resonated with the local priorities at the heart of their project, they also knew that the model needed something *else*, an additional coordinate that could better characterize how colonial systems and specific histories have deeply impacted Hawaiian residents' lived experiences. Grounding this additional coordinate in decolonial thought, they added "place-based" to the Feminist Energy Systems model, so it became the Place-Based Feminist Energy Systems (PBFES) framework (Kilolu, Selarque & Chow, 2023, pp. 9-10).[12]

Their hunch to include a place-based dimension was affirmed as they quickly learned that Molokai-specific information (from which they might have begun to develop an evaluation tool) was frequently missing from or collapsed into more aggregated forms of data. As D'Ignazio and Klein (2020) note, "The phenomenon of missing data is a regular and expected outcome in all societies characterized by unequal power relations, in which a gendered, racialized order is maintained through willful disregard, deferral of responsibility, and organized neglect for data and statistics about those minoritized bodies who do not hold power" (p. 39).

The group's focus on place initially led them to the Aloha+ Challenge. Adopted by the Hawaiʻi State Legislature in 2014, the Challenge sets six sustainability targets[13] that align with the United Nations Sustainable Development Goals (SDGs).[14] It was at this point in their research that we had our initial meeting, and a significant part of our first conversation was about the poor fit between the data that the Aloha+ Challenge strove to collect for its dashboard and the more complicated stories that Molokai residents wanted to tell.[15] For example, many species that residents considered to be

[11] Crucially, they were given this task after the researchers asked what they could do to help (see Sierra Club of Hawaiʻi, 2021).

[12] This is partiality in action. It can be uncomfortable for folks whose jobs are often understood in terms of expertise and/or a comprehensive knowledge base to learn that they have missed something. Crucially, though, what we "missed"—the Indigenous and place-based implications of and possibilities for our model—demonstrates precisely *why* feminists insist that knowledge is partial. We are differently situated from these researchers, and the knowledge and understanding that emerged from their distinct social location complemented and augmented our model in exciting ways.

[13] Clean Energy Transformation; Local Food Production and Consumption; Natural Resource Management; Solid Waste Reduction; Smart Sustainable Communities; and Green Workforce and Education.

[14] https://sdgs.un.org/goals

[15] Stories that resembled those collected by Lim (2023), such as the feelings of frustration and betrayal on the part of (largely) Black residents of Roanoke about proposed bike lanes. Why did bike lanes that would serve

crucial for their community's well-being were not figured into the Challenge's "Natural Resource Management" section, and residents also had questions about how the community could access natural spaces for cultural practices. An Aloha+ goal of "Reduce GHG emissions," was rephrased by the community as "How should the ways to reduce fossil fuel use and GHG emissions be determined?" And a goal of "provid[ing] enough land in farms to support local agriculture" was critiqued by the community for ignoring the amount of land needed for energy production (Kilolu, Selarque, & Chow, 2023, p. 8).

In short, our colleagues were facing several dilemmas in developing a scorecard to aid in evaluating possible renewable energy projects on Molokai: They thought that the Feminist Energy Systems model could inform more responsible metrics, but they were also aware of the need to revise that model to take into account the lived realities on Molokai, where protracted inequality and unjust energy burdens were felt and lived. The place-based framework of the Aloha+ Challenge to which they initially turned, however, seemed misaligned with how the Hui was guiding them to listen and evaluate.

Flipping the script: Eliciting community feedback first and placing metrics last

By the time of our next meeting several months later, Kilolu, Selarque, and Neville had a new draft of the evaluation tool, which they had modified with a deceptively simple maneuver: they moved a blank/open space that was originally at the bottom of the tool to the top. The blank space was titled "Impacts to Culture" and was intended to be a place where developers and planners would be forced to consider Molokai's cultural values first, along with the desires, questions, and energy dreams expressed by its residents, rather than last. Molokai's energy values would lead and center planning, rather than serve as an addendum. This move also foregrounded the uncertain, multiple, and open-ended nature of alternative energy relations.

Open-ended prompts like this typically appear at the end of scorecards and evaluation tools, if they appear at all. We would like to pause to appreciate what the Molokai researchers make possible by opening with such questions. This reversed placement can not only make community partners and consultants *feel* differently (i.e., included, valued, accorded respect as experts—all of which are crucial), but it can also elicit unexpected and novel kinds of data. In the words of D'Ignazio and Klein (2020), this allows us "not [only] to visualize data but to *visceralize* it" (p. 84). "Deliberately embracing emotions like wonder, confusion, humor, and solidarity," they argue, enables a kind of "data maximalism," where "multisensory entry points, greater accessibility, and a range of learning types" (p. 88) are both welcomed and utilized.

In the final iteration of this evaluation tool, called the Place-Based Feminist Energy Systems Evaluation (PBFES) Tool (see Kilolu, Selarque, & Chow 2023), this single open-ended cultural question became an entire "place-based" category that included eight open-ended questions prompting prospective energy developers to demonstrate a deep engagement with the community's place-based concerns, including cultural context; the impacts of the proposed project on natural resources, cultural resources, and land access; the project's alignment with community-based regional plans for energy, land use, and economic development; and how the proposed project could help create a more resilient future for Molokai residents.

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primarily white residents displace, as a community issue, their ongoing need and request for improved public transit service? "In the eyes of these residents, representatives from the city who were narrowly focused on singular goals were not listening to the voices of residents and were not aware of important context." (p. 5)

The iterative process our colleagues undertook in co-creating the evaluation tool with the Hoʻāhu Energy Cooperative Molokai and the Molokai Clean Energy Hui not only resulted in the tool itself, but it also helped affirm the place-based values of this community: *aloha ʻāina*, *kuleana*, and *pono* (see footnote 9). Our colleagues further enacted these principles by centering relations, listening, and learning in the iterative, community-engaged process they followed to create the evaluation tool, and imagining—alongside the community—how solutions might be "'lived'" (Lim 2023, p. 4).[16] What is noteworthy is that the tool does not separate the values that were articulated through the community-building processes from the more technical task of evaluating energy projects.

The PBFES Tool was collaboratively imagined and co-created via Participatory Action Research and three rounds of tool development, revision, and refinement with members of the Hoʻāhu Energy Cooperative Molokai and the Molokai Clean Energy Hui. The evaluation tool consists of 42 prompts that span the five dimensions of the PBFES framework (see Kilolu, Selarque, & Chow 2023, pp. 11-17). This justice-oriented research tool shows that non-reductive measurement techniques can be designed—and, in fact, already *have* been designed. It provides a model for prioritizing the development and maintenance of strong community relations to ensure the experiences of marginalized communities are not sidelined or excluded from planning processes. Indeed, as noted at the beginning of this article, Baker *et al.* (2023) argue that measurement difficulties can be surmounted not only via "sustained and consistent funding" but also via "a system that prioritizes relationship building and [that] acknowledges the time [and, we would add, caring labor] required to do so" (pp.753-754).

Toward place-based, contextualized, and mindful measurement

Although a full description of the Molokai tool is beyond the scope of this essay (see Kilolu, Selarque, & Chow, 2023), we wish to draw attention to a few of the ways that it illustrates a "metrics-last" approach. To review, the tool was designed to be used by planners, researchers, and community leaders to help them evaluate possible renewable energy projects, and it was also intended to be used by energy developers to guide them through the work that needs to be done *before* approaching Molokai residents with a proposed project. The tool aims to communicate with developers the community's "desire. . . to see energy developers be transparent, accountable, and responsive to public inquiry and input." At the same time, the quality of an energy developer's responses to the prompts can provide the community with an important window into the developer's "underlying attitude" about "working collaboratively with the community" (Kilolu, Selarque, & Chow, 2023, p. 11). It also provides a mechanism for the Hoʻāhu Energy Cooperative "to hold their own projects accountable" to Molokai residents' values and priorities (p. 11). The process of creating this tool allowed the energy script to be flipped, as it were, by organized and empowered residents who enumerated their own plans for energy sovereignty and then created a mechanism to ensure that those plans and desires would be prioritized in energy decisionmaking.

The Molokai renewable energy evaluation tool enacts precisely what anthropologist Myles Lennon (2021) calls for in his arguments against the "reductive environmentalism" (p. 1) of solar campaigns in low-income Black communities. A tight focus on (the lowest) cost by those guiding communities toward local solar providers—what Lennon refers to as the "means of reduction" (2021, p. 2)—makes invisible the sometimes violent and inequitable labor conditions that make these low costs possible. Lennon situates solar campaigns within broader energy democracy movements, and

[16] According to Lim (2023), tree planting, for example, is not shown to "meaningfully" change or reduce how hot it feels during a heat crisis. Such "lived" realities, he argues, should inform the gathering and sharing of qualitative and visceral data.

insists that low-income communities could choose to navigate a more complex, even "messier," set of variables that include a consideration of the "racialized sacrifice zones" involved in solar manufacturing (p. 7). In focusing solely on "mobilizing consumers to reduce costs," he argues, an opportunity is lost to "[mobilize] a critical mass of marginalized people to equitably transform infrastructure" and "lay the foundation for a broader movement to democratize energy in ways that include all communities of color" (p. 9).

By way of contrast, the Molokai Clean Energy Hui articulated clear and non-negotiable values that the community had committed to prioritizing above investor-friendly, least-cost energy projects and incorporated those values into their renewable energy evaluation tool. Moreover, in addition to the place-based coordinate, they also incorporated many other justice considerations outlined in the Feminist Energy Systems framework, including a concern for the full lifecycle of renewable energy projects. In the Technological category, for instance, developers are asked to outline the proposed project's "after-life plans," articulating "how project assets will be managed after the project is decommissioned," including a discussion of "discarding, recycling, and repurposing options" (Kilolu, Selarque, & Chow, 2023, p. 16). Such a move opens an opportunity to discuss a given project's future solar e-waste burden and how to prevent it from being dumped in poor Global South communities.

Because they had already come together, discussed, and articulated their energy sovereignty priorities, Molokai residents could rely on and rest in the stability of their values, rather than chase after the cheapest or most convenient renewable energy system options. The evaluation tool our colleagues and their Molokai collaborators created was therefore designed not to optimize cost-reduction or other neoliberal performance metrics of distributional justice but, rather, to honor the community's explicitly stated principles and to plan for and enact the energy world(s) that they collectively desired.

Creating a framework for energy sovereignty on Molokai

As the work to create the PBFES renewable energy evaluation tool was underway, the Molokai Clean Energy Hui also launched the first phase of a community-led process for developing a "roadmap" for achieving 100% renewable energy on Molokai by 2040. The end goal of this island-wide planning process was the development of a portfolio of renewable energy projects that are "feasible, respectful of Molokai's culture and environment, and strongly supported by the community" (MCEH 2023, p. 12). Used alongside the Place-Based Feminist Energy Systems Evaluation Tool, the roadmap could provide energy developers and planners insight into the types of renewable energy projects that were likely to receive widespread community support.

To develop the roadmap, the Hui and its collaborators led a two-year, island-wide, community-engaged co-design planning process that included 2,800 conversations with local residents, the administration of 713 surveys, 30+ focus group workshops, and 17 community events. On a 38-mile-long (61 km) island with a population of only 7,500 people, the number of community participants who engaged in this process was substantial.

The result of this two-year process was the 103-page Molokai Community Energy Resilience Action Plan 1.0[17] (CERAP 1.0), which was prepared by the Molokai Clean Energy Hui in collaboration with Sustʻāinable Molokai and the Hawaiʻi Natural Energy Institute at the University of Hawaiʻi at Mānoa. The plan includes a description of the community-engagement process, followed by a roadmap for achieving 100% renewable energy on the island. This roadmap details a

[17] The '1.0' in the title is intended to signal that it is a "living document" which is expected to evolve over time.

portfolio of ten potential renewable energy projects that received broad community support throughout the CERAP process and that align with community priorities and values. Five of these projects were "ready for design and action," while the other five were promising possibilities that needed further feasibility studies before they would be actionable (MCEH 2023, pp. 77-97).

According to Selarque, the Molokai CERAP 1.0 has become an "influential and an often-cited document" for a number of community-based organizations and energy equity/justice groups across Hawai‘i and has been important for "pushing boundaries, challenging assumptions, and expanding the imagination of both community members and utility/government decision-makers" with regard to "what is possible in the energy sovereignty/self-determination space" (personal communication with Selarque). Moreover, the CERAP offers "a model for how energy planning can be done in rural communities, on islands, across Hawai‘i, and anywhere that values democratic systems of decision-making that are informed by transdisciplinary expertise" (MCEH 2023, p. 24). In other words, the plan is both specific to the community of Molokai, but it also features a process that is adaptable to other communities with a history of top-down energy decisions that have broken trust.

A notable contribution of this report is that it models how place-based values can be centered in energy planning initiatives. For instance, a full-page description of Molokai's community values is featured at the beginning of the report, directly following the Executive Summary, Dedication, and *Mahalo* (expressions of gratitude) (p. 21). Following these values, the community-centric co-design process is foregrounded in the first half of the report, a process which began with the Hui's identification of "four ingredients that would need to be in place *before* value-based, island-wide planning could begin." These ingredients (Figure 1) include:

1. Dedicated leadership that is trustworthy and accountable
2. Firm commitment to community goals and values
3. Equal parts community expertise AND technical expertise
4. A place-based process for community co-design.

Figure 1: The Molokai Clean Energy Hui's four key ingredients needed to unlock a 100% clean energy future. Figure by Sébastien Selarque, reprinted with permission (MCEH, 2023 p. 35)

Transparency was critical to this process, as was acknowledging the relative steepness of all participants' learning curves. Indeed, learning was understood to co-occur with solution-designing and was explicitly described as a process requiring "patience, open communication, and holding each

other's hand[s]" (MCEH, 2023, p. 38). Crucially, the Hui called upon its partners in developing robust educational programing to help the community reach the level of technical literacy required to fully engage in the energy planning process. Through a series of six "energy briefs" which took place over a span of several months, community members learned about topics such as "siting and land use," "grid basics," and "energy economics" (MCEH 2023, p. 42). Nestled within the broader community-centered planning, these educational activities allowed residents to experience and understand the so-called "objective" dimensions of a given energy system ("how it works") alongside, and in fluid conversation with, its political and cultural dimensions.

The second half of the report outlines the "Clean Energy Roadmap" for Molokai that was developed through these community-engagement processes. Here again, the CERAP demonstrates how place-based values can be centered in energy planning. Six core community values are specified and then translated into non-negotiable energy system *requirements* (Table 3), which are each followed by one or more policy recommendations. As the report asserts, these requirements "are not 'aspirational' hopes or statements of value," but are rather "strong community priorities, concerns, and frustrations that have contributed to the rejection of every proposed energy project" on the island leading up to the release of this action plan (MCEH, 2023, p. 74). The report makes clear that these value-based energy system requirements must be respected and addressed by any proposals for renewable energy development projects on Molokai.

Community Value	**Energy System Requirement**
Aloha ʻĀina [Love of the Land]	Current and future impacts to *ʻāina* are PRIMARY, not secondary, considerations. While the RE [renewable energy] transition addresses global climate change by eliminating the burning of fossil fuel, it also creates new impacts and waste that must be mitigated. Responsible decommissioning and recycling for all RE projects and equipment on Molokai are a non-negotiable requirement. RE projects should not pollute the *ʻāina* with toxic chemicals or send pollution to damage *ʻāina* elsewhere. Energy plans must include requirements for ecosystem rehabilitation and restoration, and must limit the amount of newly created junk and pollution at the project site.
Ea: Self-Governance and Independence	Communities should have the final say on informed choices that are best for them, and the ability to pull consent at will. This means that every person in the community should have multiple opportunities to voice their feedback and clearly see follow-up on how community input is directly shaping decisions. Engagement methods should empower communities to lead their own culturally informed planning and approval processes by hiring and supporting on-island planners. Engagement schedules should maximize convenience for residents and avoid overall fatigue with too many meetings/events. A community-led process requires more time, significant resources, committed expertise, ongoing and diverse engagement methods and an open mind. Good decisions require good data, which was shockingly difficult to get for many basic energy, water and other questions on Molokai. The community will want to address systemic issues—including equity and social justice concerns—and the result will be very different from a traditional energy plan. The CERAP process and tools are examples that communities and agencies can adapt to their situations.

Disaster Resilience	Molokai's renewable energy system should improve access to reliable clean electricity island-wide at all times, so residents are secure during and after an emergency or disaster. The critical connection between energy self-sufficiency and emergency preparedness should be reinforced by all organizations responsible for these life-saving services. Residents should not bear the burdens of brown-outs, black-outs and damage to property caused by an insufficient system.
Sustainability	Molokai's RE solutions need to be more than just energy solutions. RE projects must generate greater security, resilience, support, and independence for the island and its people. RE project design should invest in lasting, quality technology to ensure all essential community needs are met in perpetuity. RE projects need to maintain, if not improve, the state of natural resources and people. A qualified local workforce to install, operate, maintain, and repair RE systems is key to lower costs and quicker recovery, especially during extreme weather events in remote areas.
Energy Equity	Energy equity on Molokai means that EVERYONE is included and considered during energy planning. Burdens should not be forced on certain geographics, classes, or unborn generations. RE planning and projects should provide a diverse range of options that increase fair RE access, including rebates or incentives for all residents, not only HECO customers. Many Molokai residents live where electric infrastructure is not feasible. Others do not own their own homes, cannot finance the upfront costs of an RE system (sometimes including roof upgrades). In the past, individual RE projects shifted costs to everyone else on the system, which hit low and moderate income families hardest. The costs, benefits, and burdens of transitioning to RE needs to be shared equally by everyone (the entire Molokai community AND Molokai's energy providers, regulators, policy makers, and developers).
Affordability	Molokai is inspired and informed by our neighbors on Kauaʻi who have achieved 60% renewables and improved resilience without a rate increase and are protected from the oil price volatility. Electricity cost increases often strike when communities are most vulnerable. An island-wide RE transition that is truly inclusive and fair will cost money. Communities need a deeper understanding of energy economics and creative options for financing projects, rebates, and incentives. Community benefits can also help balance out some costs.

Table 3: Molokai's value-based energy system requirements as specified in the Molokai Community Energy Resilience Action Plan's Clean Energy Roadmap.[18]

In *Data Feminism*, D'Ignazio and Klein ask readers to reflect on "What might be gained if we not only recognized but valued the fact that data work involves multiple voices and multiple types of expertise? What if producing new social relationships—increasing community solidarity and enhancing social cohesion—was valued (and funded) as much as acquiring data?" (p. 135). The case of Molokai provides a clear answer to these questions: nurturing community relationships can facilitate energy justice.

[18] MCEH, 2023, p. 74. Please see the report for the excellent policy recommendations that the Molokai Clean Energy Hui also offers based on these community values and energy system requirements.

These methods also exemplify an approach that we are calling "metrics last," a praxis that has been enacted by activists, communities, and scholars who are working toward energy justice from anti-racist, Indigenous, queer, decolonial, feminist, and disabled perspectives. As D'Ignazio and Klein articulate, although "counting and classification can be powerful parts of the process of creating knowledge," they are also "tools of power in themselves" that have historically been used to "dominate, discipline, and exclude" (2020, pp. 122-123). Even when not intentionally used in this way, counting and classification can also inadvertently silence certain voices in the name of "clarity, cleanliness, and control" (2020, p. 130). To correct for this tendency, D'Ignazio and Klein advocate for "embracing pluralism in data science," which means "valuing many perspectives and voices and doing so at all stages of the process—from collection to cleaning to analysis to communication" (2020, p. 130). Putting metrics last is a tool for embracing pluralism, for prioritizing other less "tidy" forms of information gathering that cannot easily be translated into numerical values but that can deepen and expand understanding in crucial ways.

4. Conclusion: The slow justice of putting metrics last

Dear reader, perhaps you work in government, nonprofits, or other groups with an interest in energy justice. Or perhaps you are a scholar or activist who engages with the state, utilities, or other sites of power in your work. In this conclusion, we want to address the question we often receive in these spaces: *Thank you for these insights, which we find compelling*, the questioner often begins. *However, given the practical nature of our work, and the need for urgency and large-scale transformation, how can we possibly enact these ideas as policy?*

Sometimes the question is asked with exasperation, sensing the difficulty of the task; sometimes with a confused curiosity, not even sure how to begin. These emotions are understandable. A "metrics-last" approach will disrupt the status quo, will shake it to its foundations, and if it is done well, it should require thoroughgoing transformations in how things are done in powerful institutions. A "metrics-last" approach will often be unappealing to states and corporations because it actively stymies business as usual. A "metrics-last" approach will also challenge dominant epistemologies, forcing practitioners to rethink how they have been taught, how they practice their own science, and what role their expertise should play. Structures of power in civil society are at stake, but also the structures of power that govern scientific expertise, which threatens the grant funding and career achievements of individual people. That can make change extraordinarily difficult. A "metrics-last" approach will still need data scientists and experts in quantitative methods, and yet their role will be more collaborative and in service to questions posed from other locations.

This points to an underlying doubt that haunts this article: whether engaging with energy scorecards with the hope of improving them is naive at best, if not actively harmful. The historical and ongoing role of the state (especially the U.S., where we have lived and worked) in upholding structures of extraction and exploitation cannot be forgotten, even when people working in state agencies may sincerely desire radical change. Geographer and urban planning scholar Laura Pulido (2017) argues that the state cannot be an ally to environmental justice, or a neutral place for making change, given that the state is invested in upholding racial injustice—and, we might add, gender injustice, too. Pulido notices that "most activists and researchers are steeped in a liberal politics in which they work with the state. Instead, the state must become a site of opposition" (2017, p. 525). This insight is obvious under fascist or fascist-aspiring regimes like the Trump Administration, but scholars like Pulido are pointing out longer-standing problems that also characterize liberal states in their alliances with racial capitalism.

The U.S. state has actively avoided addressing the structural causes of racial injustice, Pulido writes, because doing so would be "too costly and disruptive to industry, the larger political system, and the state itself. Instead, the state has developed numerous initiatives in which it goes through the motions, or, 'performs' regulatory activity, especially participation" (Pulido, 2017, p. 529). The performance of justice not only upholds the status quo by distraction and delay; it also generates new injustices for the communities invited to the table under the guise of "participation" and "community input." As Bell and colleagues (2024) argue, when procedural and recognition justice are violated—as has been the case with performative public participation surrounding the permitting of new natural gas pipelines in the U.S.—it brings real and measurable harm to people and communities.

The changes to energy systems currently underway are massive. But they also represent important and unique political moments where there are openings—however narrow and fraught—for intervention. This is especially true in a moment when justice appears as a central plank in mainstream climate and energy plans, which is the result of hard work on the part of climate and environmental justice movements. So while scorecards may embody a shallow representation of justice, and while powerful states and industries are unlikely to transform as the result of an academic argument that points this out, we still believe it is important to bear witness to, and engage with, these attempts to deliver justice. A "metrics-last" approach also contributes to energy justice scholarship, and to energy justice movements, by identifying the dominance of metrics as a powerful obstacle that they face, and by providing a shared framework and resources for contesting it.

Time will be a key point of contention when "metrics-last" approaches are considered. The word "last" emphasizes the problem of time in the pursuit of justice. A "metrics-last" approach does not lend itself to being universalized or "scaled up," which we consider a feature rather than a bug, based on our assumption that democracy, too, rests upon intimate everyday relations of trust, listening, and learning, rather than on large-scale and measurable acts of voting with ballots or dollars. As a result, "metrics last" can feel too slow, especially given the sense of urgency in confronting climate change.

Climate urgency can be the most difficult emotion to contend with for those working toward energy and climate justice. Climate urgency—the notion that something must be done to address global warming, and quickly—can be insidious, which is an insight that we have learned from Potawatomi scholar Kyle Whyte (2020). He argues that although most climate-related discussions and planning efforts focus on how to avoid the ecological tipping point—the point at which climate impacts become both perilous and irreversible for the planet—there is a second tipping point with which we must be concerned if we hope to enact environmental justice. This second tipping point, which he calls the "relational tipping point," is crossed when social institutions fail to prioritize "consent, trust, accountability, and reciprocity" in their climate mitigation strategies (Whyte, 2020).

The work that is required to repair these relations is slow and careful work, and may seem too slow for the rapidity of ecological destruction that we are witnessing. Whyte observes that the slow time of building new relations of trust between white settlers and Indigenous peoples, for instance, often appears to obstruct the rapid implementation of green projects. However, broken kin relations caused the crisis in the first place, Whyte argues, and therefore, repairing these relations will be necessary if we hope to respond to the damage. In other words, this repair work is not just a matter of paying back what is owed. It is also a matter of addressing the root cause of the violence, for by failing to seek, build, and enact these "relational qualities," it is impossible for social institutions to "carry out swift responses to urgent problems without perpetrating injustices" (p. 3). This work takes time, but, as Whyte argues, coordinated action that centers justice is simply not possible without consent, trust, accountability, and reciprocity. The urgency of the climate crisis, then, "must be aimed at addressing ecological and relational tipping points together" (p. 6).

The case of Molokai powerfully illustrates Whyte's insights. Before the island-wide energy planning process was undertaken by the Molokai Clean Energy Hui, residents had rejected all of the large, utility-scale renewable energy projects that had previously been proposed for the island. Through a two-year process of deep community engagement, which included technical education, conversations, surveys, focus groups, and co-design workshops, a portfolio of 10 possible renewable energy projects that "generated broad community consensus" was articulated (MCEH, 2023, p. 11). Because the leaders of this process embraced an ethos of "go slow to go fast" (MCEH, 2023, p. 36), these projects are now being brought to life quickly.

A "metrics-last" assessment that incorporates Indigenous understandings of the necessity to heal relations may slow down and complicate decision-making processes, possibly completely derailing some energy projects. But justice takes time to enact because it involves listening and nurturing relationships, which the participants in Molokai and others refer to as moving "at the speed of trust" (MCEH 2023; see also brown 2017). Ethnic and disability studies scholar Mel Y. Chen (2023) also ponders—and pauses before—these rushes to action, reflecting, "[I]n light of such ecological devastation … I feel suspicious of the urgencies that may predominate" (p. 98). Calling our attention to the "inseparability" of settler colonialism and environmental management, as well as to the processes through which toxic environments materialize in the bodies of vulnerable populations, Chen (2023) calls for a slowed down process of recognizing the "simplest forms of 'interconnectedness' … that need to be accounted for and addressed, even mourned, especially mourned, differentially mourned … ." (p. 98).

The problem of time points to a wide gap in terms of the goals for energy justice. The kind of justice that decolonial and feminist visions demand is one that will take time, because it will require the repairing of relationships. If the goal is to build more lower-carbon energy systems, then relationship repair can seem to get in the way because it might require moving more slowly on design, permitting and construction. Thus, the sense of urgency surrounding the climate crisis can actually appear to be in direct opposition to the desire for justice.

However, what if the goal were not better fuel technology, but better energy relations? Energy use and production emerges from interpersonal and interspecies relationships. When energy needs emerge and are defined through relationships, they can't be alienated from the people and ecologies with which they are entangled; they can't be as easily commodified. And unlike dollars-per-kilowatt, better energy relations are difficult to measure with numbers. .

Power infuses every moment of our energy encounters, and feminists insist that power should not be obscured. What if, in our situatedness, we moved at the "speed of trust," acknowledging our fundamental interdependence? A feminist energy shift can enrich our energy relations: from ranking and valuing beings with numbers, to relations through which power is collaboratively generated and shared. Across each of the cases examined here—the Energy Equity Project, Siamanta's CREE, and Molokai residents' energy sovereignty efforts—we see evidence of new energy relations forming. Moving at the speed of trust does not mean inaction. Justice can sometimes take time, its processes unfolding slowly, but it can always be urgently pursued; it should begin as soon as possible, with all due seriousness and commitment.

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