Original research article

Reimagining energy futures: Contributions from community sustainable energy transitions in Thailand and the Philippines

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ARTICLE INFO

Keywords:
Prefigurative activism
Sociotechnical imaginaries
Social mobilization
Southeast Asia

ABSTRACT

This article counters conventional discourses where sustainable energy transitions in the Global South have been broadly linked to top-down policy frameworks, large-scale installations, and donor-driven interventions. It does so by highlighting the roles played by and the potentials of bottom-up, small-scale, and community-driven initiatives in shaping energy transitions in these locations. We shed light on two of these initiatives: a rural, community-based renewable energy project in Thailand, and a community-led social movement that prevented the construction of a coal-fired power plant in the Philippines. Both cases demonstrate how community mobilizations help facilitate sustainable energy transitions in the Global South, despite their many social, political and economic constraints. The analysis draws from concepts of local activism and community engagement on energy transitions, marrying the social movement concept of prefigurative activism with the concept of sociotechnical imaginaries in science and technology studies. This article highlights that valuable insights can be generated from rural- and community-driven renewable energy initiatives and their power to reimagine the futures of energy systems in the Global South.

1. Introduction

Energy transitions are unpredictable, complex, and highly diverse sociotechnical endeavors [1]. They are shaped not only by technical aspects (e.g., new technologies and grid integration) and economic factors (e.g., costs), but also by political decisions (e.g., supportive policies and power struggles) and social dynamics (e.g., community engagement and activism). Nonetheless, there remains surprisingly little scholarly attention to the sociopolitics of energy transitions vis-à-vis the focus on techno-economic issues [2]. The sociotechnicality of energy transitions gains salience especially when these dynamics are analyzed as social behaviors, including, for example, the role of communities in shaping energy systems [3] or the democratic meaning attached to nuanced networks of energy transition coalitions [4]. An oft-cited illustration is that of Germany’s Energiewende, which can be described as a product of extensive community involvement and resistance against nuclear power [5], and consequently, was triggered by large-scale social acceptance [6]. For Hess [7], social movements can generate substantial forces to push for change and reforms by putting pressure on existing industries and foster social experiments. In envisioning and practicing “alternative pathways,” these social movements create laboratories of innovation and spur tests of alternative technologies. Similar lines of arguments can be found in niche-level experiments within the broader field of sustainability transitions research [8].

While scholars have analyzed the sociotechnical nature of energy transitions in the Global North, the lack of inquiry for countries in the Global South remains striking. In these understudied locations, energy transitions are still largely perceived as (and expected to be) top-down, government-led, private actor-driven, and/or donor-initiated interventions that highlight the technical – rather than the sociotechnical – potential of renewables and demonstrate their economic feasibility [9]. In the context of development aid, technological ideas and experiences related to energy transitions are often understood as transfers from technologically advanced countries (usually in the Global North) to the Global South, often without acknowledging their differing socio-political contexts [10]. The role of social innovations that are brought about by empowered communities producing their own social mobilizations is even further marginalized in the technocentric understanding of energy transitions.

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Emerging contributions to this area include works by Avelino et al. [87], Cherp et al. [88], Geels et al. [89], Healy and Barry [90], Scoones [91], or Marquardt et al. [92].

https://doi.org/10.1016/j.erss.2018.10.028
Received 28 May 2018; Received in revised form 30 October 2018; Accepted 31 October 2018
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This article addresses these gaps by providing empirical examples of what can be called “preffigurative” activism – that is, activism based on a strong alternative vision of the future - in two Southeast Asian countries. We present two case studies to demonstrate how social mobilization and community involvement can foster renewable energy deployment or prevent coal power expansion in these locations where social movements are imagining energy futures in sharp contrast to the dominant fossil fuel-based narrative. In both cases, social movements have emerged from actions led by individuals/citizens, communities, and environmental organizations which continue to challenge the status quo of the energy systems propagated and held by powerful groups with vested interest. We argue that citizens and communities outside and beyond centers of power have the capacity to produce and perform new sociotechnical imaginaries and prefigure desirable alternative energy futures.

In this paper, we perceive energy transitions as radical changes in sociotechnical systems that are not solely about implementing energy innovations, alternative technologies, and the social practices around them (as demonstrated by the Thai case), but also about strategies of resistance against a fossil fuel-based status quo (as shown by the Philippine case). In this context, social mobilization for energy transitions encompasses the dynamic processes of citizens and community involvement, and engagement not only in favor of renewables but also promoting the displacement of the fossil fuel regime. We analyze these dynamics and trace how alternative visions of energy futures are being materialized in Thailand and the Philippines by merging the conceptual frames of (1) prefigurative activism (from social movement studies), and (2) sociotechnical imaginaries (from science and technology studies, STS). We ask: How can community-led social movements help in envisioning alternative and more sustainable energy futures in Thailand and the Philippines within their current predominantly fossil fuel-based development contexts?

Such a question relates to broader discussions in energy research and social sciences. While assessments for energy technologies are often reduced to measurable, technical and rational indicators [11], a future-oriented social mobilization perspective brings back the role of values, norms and politics attached to energy options. A better understanding for envisioning processes and the imaginary power of communities also looks at the underlying causes for social impacts such as behavioral change, social cohesion, and capacity building [12], as well as community building, empowerment, and local ownership [13]. Equity, social justice and human rights impacts [14] are equally part of an imagined energy future. Establishing and sustaining a certain ideal of an alternative energy future should also be considered as a driver for energy-related social protest that shapes both discourses and action in energy development [15,16].

The case studies are located in Phetchaburi, Thailand (a community implementing renewable energy projects), and in Palawan, Philippines (a community resisting the construction of a coal-fired power plant). Both cases show how, at the community level, social mobilizations through prefigurative activism had helped develop alternative visions of a sustainable energy future in opposition to the fossil fuels-based energy development imaginary. The concept of prefigurative activism, on the one hand, allows us to investigate the explicit and outspoken future visions related to innovation, social experiments and change. Sociotechnical imaginaries, on the other hand, helps us to shed light on issues of knowledge production, ideas of social order, and power struggles related to envisioned energy futures.

To set the stage for this investigation, Section 2 provides a brief overview of the current debates on energy transitions and community mobilization in the Global South. In Section 3, we develop a conceptual framework around insights from prefigurative activism and sociotechnical imaginaries. Data collection and assessment methods are presented in Section 4. We use a qualitative research design involving document analysis, interviews, and participant observation to present these energy transition activities. Both case studies are presented in Section 5, followed by a comparative discussion (Section 6), and concluding remarks (Section 7). In sum, we present how local, community-oriented initiatives can construct alternative visions of the future of energy systems in the Global South. Although policy-makers whose preference for large-scale development interventions continue to define the processes of energy future-making in many governments, we show how communities possess capacities to perform counter-narratives and alternative imaginaries, while at the same time, prefigure energy transitions. Echoing Tidwell and Tidwell [17], we hope that these insights can encourage scholars in energy research and social science to further investigate the dynamics at and the role of local-level energy debates and everyday contexts as the locus of collective visioning and emerging imaginaries in sharp contrast to the current focus on top-down policy frameworks, large-scale installations, and donor-driven interventions. Yet, it also needs to be critically assessed if these imaginaries can initiate widespread change nationwide or if they remain “bounded” to specific local contexts without broader implications [18].

2. Fostering energy transitions in the Global South

Transitions from fossil fuels toward sustainable, environmentally benign, and perpetually available renewable energy systems have become a global imperative, most notably due to international norms (e.g. the 2015 Paris Agreement and the 2030 Agenda for Sustainable Development), market forces (e.g. the declining cost of renewable energy technologies), and changes in the regulatory landscapes. Although these developments have in general pushed governments and businesses in the Global South to experiment with supportive policies and develop innovative business models respectively [19], developing countries have also taken quite different pathways to facilitate their energy transitions. While small island states, archipelagos, and countries with scattered landscapes, for example, have underlined their commitments to fully shift to renewable energy [20], more industrializing countries – China, India, and Indonesia in particular – still see an important role for fossil fuels [21].

Whereas scholars increasingly discuss energy transitions towards renewables in the context of energy equity, social justice or energy democracy in the Global South in general [22] or for a wide range of countries such as Vietnam [23], Mexico [24], or South Africa [25], their energy systems are still heavily dominated by fossil fuels. Along these lines, governments in Thailand and the Philippines have underlined their continuing dependency on fossil fuels for advancing economic development, while highlighting their commitment to renewable energy deployment at the same time. Both countries are increasing their greenhouse gas emissions profiles, but they are also parties to the Paris Agreement, recognizing the need for energy transitions in climate mitigation.

Both cases described here can act as proxies for rapidly growing countries and emerging markets in the Global South. These countries are becoming increasingly relevant in terms of global greenhouse gas emissions. Although their Nationally Determined Contributions (NDCs) to the Paris Agreement recognize the need for more sustainable development pathways, their national policies are still largely focused on economic development primarily based on fossil fuel combustion. It is, therefore, not unusual to see Thailand [26] and the Philippines [27] exhibiting their unwavering support for fossil fuels, documented by respective national policies. In these policy documents, the macro-policy environment takes the center-stage, marginalizing, if not erasing, the contributions to energy transitions by citizens and communities at
Social movements often emerge from (or lead towards) more contextual conditions, economic interests, or a strong belief in particular values. Enforceable rules, and rely on continuous polling and consensus sustainability transitions [38]. Building on collective protest, social and have the potential to foster sociotechnical change and push towards politically driven networks engaged in societal concerns, among them “(…)

While social movements represent broader, highly political, and normatively oriented networks, community-led initiatives are considered here as more specific, situated, and practically-oriented groups.

The tide, however, seems to be turning against an exclusive focus on national energy policy-making and direction. Studies have emerged investigating community-based energy projects and small-scale energy interventions in the Global South, such as those exploring the role of local socio-economic structures and their effectiveness (e.g. [28,29]). In this journal’s special issue on energy and the future (ERSS Vol. 35, 2018), it becomes evident that community-based energy transitions are now being recognized as key contributors to the framing, imagining, and realizing of the futures of energy in some developing countries [30]. Despite the contributions from that special issue, there remain huge opportunities for studying the dynamics of bottom-up approaches in energy transitions in the Global South. Indeed, the same special issue, while commendable for the variety of its contributions, has only one article devoted specifically to a focus on developing countries, i.e. energy communities in Latin America [31]. Another article nonetheless sheds light on the societal and political implications of energy transitions in the Global South by highlighting the role of communities in developing Thailand’s energy-related sociotechnical imaginary [19].

In this article, we extend these recent discussions by illuminating two cases of community mobilization that are also shaping energy transitions in the Global South. While we aim to enrich the literature on this subject and expand the work above, our principal intent is to analyze these ongoing energy transition dynamics from a combined lens, i.e., from social mobilization scholarship on prefigurative activism and an STS perspective on sociotechnical imaginaries. We complement the work by, for example, Brown et al. [32], who have extensively explored the potentials of conceptualizing the role of science and technology in social movement studies due to their increased relevance in fields like health, food and energy supply. We also complement the work by Hess [33], who - in analyzing technology-oriented social movements and their relations to the private sector - brings together social movement studies with STS to investigate processes of incorporation and transformation. By the same token, this article brings together STS and social movement studies to allow us to focus “on mobilized publics and the responses of government and industrial elites to them” ([34], p. 79).

3. Analytical framework: prefigurative activism and sociotechnical imaginaries

Social movements are defined here as mainly informal, pluralistic, and politically driven networks engaged in societal concerns, among others “on the basis of shared collective identities” [35]. Their primary aim is to organize in large numbers to wield political power [36,37], and have the potential to foster sociotechnical change and push towards sustainability transitions [38]. Building on collective protest, social movements operate within a loose structure. They “are not held together through a formal membership structure, do not have binding and enforceable rules, and rely on continuous polling and consensus building among the participants” [39]. They are driven by large and diverse sets of motivations such as personal frustration towards existing conditions, economic interests, or a strong belief in particular values. Social movements often emerge from (or lead towards) more context-specific, situated, and practically oriented community-led initiatives [36].

A key motivator for communities and - broadly - social movements to rally against the status quo is their high confidence in a future that is different. In other words, social movements are driven by prefigurative actions and alternative visions of the future—visions that can be perceived as threats to existing, dominant, and incumbent power relations and interests. Prefigurative activism is essential in social movements as it aims to achieve radical social change and reconfigure social relations by challenging dominant societal structures and incumbent interests. [40], p. 207) describes prefiguration as “the pursuit of utopian goals [...]. I recursively built into the movement’s operation and organizational style.” [41], p. 267) takes a more pragmatic perspective, calling prefiguration an analytical tool “to both refer to, and illuminate, everyday relations, tensions, and priorities within some movement contexts.” Prefigurative activism comprises “many social experiments that have the aim of fostering alternative and radically democratic practices” ([42], p. 116) by using methods “which embody the ideals of the desired future society” [43]. Prefigurative activism rests on the notion that participants “act out a vision of a better world” ([44], p. 122). Carl Boggs [45], who first coined the term, takes a much more normative perspective, describing the rejection of hierarchy, the refusal of rigid and centralized power structures that (re)produce power imbalances, and a commitment to democratization through local, collective structures as guiding principles for prefigurative activism. The normative concept, in gist, contests established power relations at various levels and includes not only governments and institutions, but also the relationships among individuals, collectives, or movement networks ([46], p. 2).

Prefiguration, thus, refers to “the attempted construction of alternative or utopian social relations in the present, either in parallel with or in the course of, adversarial social movement protest” ([46], p. 1). It is either a means of doing protest or a project-based construction of alternatives to the status quo. In this article, we discuss both but, in a nod to Boggs [45], place premium on local, collective structures, i.e. the communities. For the present work, prefigurative activism characterizes the underlying motivation for social movements that link their demands for change in the energy system to radical changes in social relations such as equity, social justice or energy democracy.

To achieve means-ends consistency, prefigurative activists often embody their political goals (or ends) within their chosen actions (or means), e.g., through direct democracy within the Occupy movement [47]. In terms of creating counter-institutions or projects, prefigurative activists engage in collective experimentation and the construction of new norms that prefigure an ideal society or a sociotechnical imaginary, e.g., through the establishment of transition towns [48]. In addition to building alternatives and its future orientation, prefigurative activism has five interrelated components or processes: “experimentation, the circulation of political perspectives, the production of new norms and conduct, material consolidation, and diffusion” ([46], p. 2).

Energy transitions represent a field where visions of a different, “prosperous, sustainable and secure energy future” ([49], p. 294) are intrinsically linked to science, technologies, and societal innovations. Aptly capturing this stance is the concept of sociotechnical imaginaries found in STS. Sociotechnical imaginaries connect the imagination of desirable visions of the future with ideas about the role of technology and innovations in society and the production of power and social order [50]. Being “collectively held, institutionally stabilized, and publicly performed,” sociotechnical imaginaries are “animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology” ([50], p. 4). Sociotechnical imaginaries are temporarily situated and culturally particular but are not limited to the scale of nation-states [50]; indeed they can also be propagated by corporations and organized groups, including communities and social movements [51].

Various imaginaries can co-exist, either in a tense or productive relationship, and thus may support or compete with the dominant national sociotechnical imaginary. Imaginaries gain “traction through blatant exercises of power or sustained acts of coalition building” ([52], p. 22) — echoing the characteristics of prefigurative activism. Imaginaries can be performed in a variety of ways, including, through social mobilization. Imaginaries not only encode what is attainable, but
also envision how life ought (or ought not) to be, and so express shared understandings of good and bad. The concept also links the present with the past and the future in conceptualizing the interrelationships between power, society, and technology. Such a co-productionist perspective [53] can also be found in a prefigurative strategy which, as [54], p. 15 argues involves two practices: “that of confrontation with existing political structures and that of developing alternatives, neither of which could achieve the desired structural changes without the other.” Whereas Maeckelbergh’s account of prefiguration in the alter-globalization movement brings to light the strategic moves towards social change, sociotechnical imaginaries shed light on the broader visions of change and social order held in society at large surrounding a social movements’ prefigurative action.

Imaginaries are not neutral, but highly political constructs – heightening certain aspects while leaving out or erasing others. They hold the potential to coordinate actions across techno-epistemic networks, foster development pathways, and can include or exclude certain actors in the decision-making process. “The power to shape technological design, channel public expenditures, and justify the inclusion or exclusion of citizens concerning the presumed benefits of technological progress” [55] is inherent in sociotechnical imaginaries which is defined in the context of this work as desirable visions of a future society where innovations in the energy sector are intrinsically linked to alternative ideas of social order at large.

While both prefigurative activism and sociotechnical imaginaries heavily draw on the notion of desirable visions of the future, they are methodologically and procedurally different in some ways. Whereas in prefigurative activism envisioning a radically different future represents a more intentionally planned and strategically used tool to mobilize the public against the status quo in society, sociotechnical imaginaries draw on more stabilized, implicit, and less prescriptive visions of the future. Bringing both concepts together and contrasting them remains valuable for both fields. Kim [51] has already shown, for example, that sociotechnical imaginaries are not strictly bound to nation-state actors but they can be particularly useful lenses of inquiry in the study of social movements. Indeed, sociotechnical imaginaries not only point at the co-production of norms and social order and link visions of the future to advances in science and technology, but also shed light on the underlying assumptions and tools for social activism that often remain unproblematised. Prefigurative activism, thus, complements imaginaries by drawing our attention to the procedural dimensions of envisioning the future and thus illuminating vision-making processes that might lead to the establishment or decline of a sociotechnical imaginary.

Both prefigurative activism and sociotechnical imaginaries relate to the underlying motivations and the explicit justifications for social movements to demand change. They both enable societal groups to contest a dominant socio-technical system, imagine an ideal future society and act out a vision of a better community in contrast to the status quo, e.g. an existing energy system. Van de Sande [56] has argued that recent Occupy movements have been misinterpreted as strategies of desertion and a retreat from politics. Instead, they should be perceived as attempts to realize a desirable society in miniature as a powerful alternative to the status quo. As such, prefigurative activism can be conceptualized – at least partly – as a form of sociotechnical imaginaries in action. In contrast, scholars like [57], p. 163) criticize the Occupy Wall Street movement for its failure to “engage in political struggles” and acknowledge the camps’ own complex and constructed power structures. Taking a sociotechnical imaginaries perspective would focus exactly on the politics and power relations attached to established structures, processes and policy subjects, as well as the – often implicit – norms and visions leading to these structures.

Bringing both conceptual lenses together, the process from alternative visions of the future to their realization can be divided into three interrelated steps: envisioning, performance, and consolidation. While they appear as seemingly consecutive steps in theory, they occur in parallel and reinforce each other in practice. As summarized in Table 1 the three categories allow to analyze the nexus between prefigurative activism and sociotechnical imaginaries. Envisioning, performance, and consolidation represent three coordinated assemblages that will guide the empirical investigation and facilitate the cross-country discussion in this article.

While Table 1 provides a number of signposts for the analysis, it also appears to simplify and suggest linearity. However, it is key to note here that social mobilization is inarguably embedded into much more contentious, multidimensional, and often messy, complex, and nonlinear dynamics. As the meaning of small-scale everyday acts of resistance by citizens and communities can quickly become blurry, the categories outlined in Table 1 help to structure the identification of important signifiers for social change or “cracks” [58] in the dominant (energy) narratives.

4 In addition, prefigurative activism and the notion of building alternatives overlaps with “other types of political activity” ([46], p. 2), including countercultures, utopianism or idealistic groupings.

### Table 1

<table>
<thead>
<tr>
<th>Envisioning</th>
<th>Performance</th>
<th>Consolidation</th>
</tr>
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<tbody>
<tr>
<td><strong>Insights from prefigurative activism</strong></td>
<td><strong>Insights from sociotechnical imaginaries</strong></td>
<td></td>
</tr>
<tr>
<td>• Future-oriented activism: Construct a desired future society</td>
<td>• Desirable vision of the future linked to ideas of social order (e.g. energy democracy, social justice)</td>
<td></td>
</tr>
<tr>
<td>• Radical alternative (to existing energy system)</td>
<td>• Vision incorporates advances in science and technology (e.g. clean energy technologies)</td>
<td></td>
</tr>
<tr>
<td>• Opposition to incumbents (fossil fuel dominance)</td>
<td>• Contest the dominant imaginary of the nation state (e.g. energy intensive development model)</td>
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<tr>
<td></td>
<td>• Ongoing coalition building (e.g. environmental NGOs)</td>
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<td></td>
<td>• Foster socio-technical innovations (e.g. electric cooperatives)</td>
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<td></td>
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<td>• New norms and conduct (e.g. energy democracy)</td>
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<td>• Material consolidation (e.g. reallocation of wealth)</td>
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<td></td>
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<td>• Establish a collectively held and institutionally stabilized vision of the future (national imaginary shifts towards new human-nature relations)</td>
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<tr>
<td></td>
<td></td>
<td>• Science and technology support new forms of social order (e.g. decentralized and democratic energy supply)</td>
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4 Methods and data

Shedding light on prefigurative activism requires a closer look at discourses, narratives, actor coalitions, and interest groups’ behavior, thus making it approachable via a qualitative research design. While a case study approach has clear limitations regarding generalizability, the comparative perspective we deploy in the discussion allows us to at least discuss their similarities, while also pointing at their differences. While for [50], p. 24), a comparative approach offers “the most indispensable method for studying sociotechnical imaginaries,” this article rather explores its potentials to identify common patterns across both cases.
Thailand and the Philippines are worthwhile countries to study. Both reflect rapid economic growth and social dynamics in Southeast Asia, one of the world’s most rapidly developing regions. The region’s economy is expected to triple in size by 2040, leading to an increase in energy demand by almost two thirds [59]. The region is also experiencing rapid urbanization and increasing populations, and, at the same time, many of its communities continue to face social and economic inequalities, and are vulnerable to extreme weather events brought about by climate change [60]. Thailand and the Philippines have witnessed strong macroeconomic growth over recent years and are thus confronted with a massive increase in energy demand and heavy investments in energy supply expansion, which, in their contexts, are mainly met through conventional, fossil-fuel-based technologies. Although supportive renewable energy legislation exists in both countries, sustainable energy technologies are still largely perceived as additional or complementary energy sources rather than fossil fuel substitutes.

This study focuses on small-scale processes and shifts rather than the macro-dynamics of energy transitions. Findings are largely derived from semi-structured qualitative interviews with national and local actors, including government officials, researchers, civil society organizations, donor agencies, business-people, farmers, and fisherfolks. Questions revolved around themes, including: technical (i.e. access to and affordability of energy technologies) and non-technical (e.g. social, behavioral, institutional, and political conditions) opportunities and challenges for energy transition. In addition to focus group discussions and interviews with local stakeholders in both case study areas, we have conducted 14 interviews in Thailand, and 15 in the Philippines using a snowball sampling approach. Ranging between 45 min and 2 h in length, the interviews were either conducted in English or (with the help of translators) in Thai or Filipino, before they were transcribed and coded to extract core themes and patterns (see Table A1 and A2 in Appendix A for a list of interview partners in Thailand and the Philippines). We also scoured policy documents and media reports, and conducted participant observations.

Following the methods suggested by Jasanoff [50], we systematically mined our qualitative material for insights into the framing of energy-related sociotechnical imaginaries and prefigurative activism. Since the use of language represents an important medium in the construction of imaginaries, we carefully investigated the choice of words, both spoken and published, and linked it to the envisioning, performance, and consolidation of the proponents’ alternative visions of desirable futures. Our codebook was developed through an iterative, data-driven, yet theory-oriented process. Similar to DeCuir-Gunby et al. [61], the codebook consists of the following components: the overarching category, the codes’ labels, explanatory descriptions, more nuanced sub-codes and the raw material where it appears. Table 2 exemplifies three different codes, each belonging to one of the three main analytical categories. The table lists their descriptions, examples and appearance in the raw material.

From this codebook, we identified and extracted recurrent discursive elements to highlight how different storylines of alternative imaginaries are emerging from these prefigurative actions that might stand in contrast to the dominant visions of a fossil fuel-based energy future in both countries. This analysis also allows us to describe the power structures and their dynamics to understand how they are reinforcing certain imaginaries or, conversely, suppressing alternatives.

5. Case studies: community-driven energy transitions in rural Southeast Asia

Although an initial perspective on renewable energy promotion in rural Thailand might seem incompatible with the resistance against coal power encountered in selected Philippine municipalities, we found that both cases share similarities that exemplify prefigurative activism and sociotechnical energy imaginaries. In both contexts, alternative visions have emerged from the bottom up and challenged their
respective status quos. We present both cases by briefly introducing their respective national-level energy contexts, then highlighting local narratives of community-based energy transitions, and finally describing how these examples are being constructed as alternatives to dominant energy imaginaries.

5.1. Thailand: community-driven sustainable energy access

5.1.1. National background

Thailand is an upper-middle income economy with steadily rising emissions – from 152 MtCO$_2$e in 1990 to 358 MtCO$_2$e in 2014 [62]. The country’s energy landscape is dominated by natural gas-fired generation, with coal and renewable energy (primarily from hydropower imported from Laos) making up most of the remaining capacity. The Government of Thailand in 2016 released its twenty-year national energy strategic plan, the Thailand Integrated Energy Blueprint (TIEB) 2017-2036. The TIEB serves as Thailand’s long-term plan to enhance domestic energy security, national development, and regional connectivity. The TIEB envisages an energy mix with decreasing reliance on imported natural gas and, at the same time, an increasing role for “clean coal.” The Blueprint also projects energy intensity reduction of 30% and a 30% increase in the share of renewables in final energy consumption. The TIEB also introduces a 5% role for highly contested nuclear energy in the country’s future energy profile. The TIEB encompasses under a single plan five formerly independently pursued plans including the Power Development Plan, the Energy Efficiency Plan, the Alternative Energy Development Plan, the Oil Plan, and the Gas Plan. In gist, The TIEB embodies the state’s official energy imaginary. Energy is distributed across the Thai energy-consuming population via a state-owned, intensive, and highly centralized grid. This distribution system extends all the way to the rural communities, except for villages inside national parks where grid extension is prohibited.

5.1.2. Local context

In one of these national parks, the Pa Deng community thrives on small-scale farming and other rural industries such as cattle raising. Pa Deng is a community of about 100 households located 275 km south-west of Thailand’s capital, Bangkok, in the province of Phetchaburi. These households are scattered in ten moo ban (villages) inside Kaeng Krachan National Park. Five of these villages are located within the jurisdiction of a dairy production royal development project; the remaining five are inside the Park. These households source their livelihoods from raising cattle, planting crops such as pineapples, maize, vegetables, plums and jackfruits, and seeking employment in nearby Cha-am, a tourist area in the Gulf of Thailand. While some of these households have access to the national grid, a majority has none due to state prohibition of grid extension in national parks. These people had no other option but to rely on expensive kerosene for cooking and lighting, and to illegally harvest cooking firewood in the nearby forest. The Government of Thaksin Shinawatra tried to address this issue nationally through a solar photovoltaic program, but this project, according to numerous interviewees in Pa Deng, failed in the absence of skills required to maintain the systems.

The Pa Deng community exemplifies a “sufficiency economy philosophy,” also known in Thailand as moso (moderation society), a rural development model attributed to the late King Bhumibol Adulyadej (Rama IX). In gist, moso is focused on a “true Buddhist way of life” where people live in self-sufficiency without greed or overexploitation of natural resources [63]. Moso is also evident in other royal development projects and has been used to organize, mostly with state intervention, networks, which are then seeded with various types of support (e.g. capacity, livelihoods, farm equipment, and more recently, small-scale renewable energy technologies, among others). The state and the monarchy extensively utilized these development interventions to enliven the Thai countryside [64]. The popularity and ability of moso and its actual projects have transcended the Thai imagination exclusively due to Rama IX’s highly revered, demigod status [65,66]. Connors [65] suggests that Thailand’s tough lèse majesté laws, which effectively ban criticisms of the royal family and, by extension, royal development projects, have extended moso projects to their almost vogue status. The vagueness and malleability of moso and the related monarchy-and-state-funded development projects, however, are subject to many forms of interpretation and contradictions [67]. An interviewed Thai academic, nevertheless, saw a potential for these networks for facilitating renewable energy transitions opining that these highly organized networks could be easily mobilized into a “strong force for facilitating and deploying community-oriented renewable energy systems that can later be scaled up.” The Pa Deng moso network – although inspired by Rama IX – thrives as a self-sufficient community without much assistance from the state. During the second author’s fieldwork in Pa Deng, such independence was evident in statements from interviewees who argued that “there are other networks in Thailand but ours is different in that we don’t rely much on the government.” This claim has then been validated by officials at the Ministry of Energy where interviewees see the Pa Deng community as a class of its own although it subscribes to Rama IX’s ideals.

5.1.3. Mobilize for an energy transition

In 2006, a development worker, named Khun Kosol (name used with permission), decided to farm in the community of Pa Deng. Bringing with him his skills in community mobilization, Khun Kosol met with his neighbors (many of whom are at least a kilometer apart from each other), and decided to form a moso network. Amongst the things they talked about was how to address their pressing energy challenges: expensive kerosene or liquefied petroleum gas tanks for cooking and diesel for generator sets for lighting and irrigation. Having identified this need, the group then started to look for alternative fuels. A biogas digester for cooking offered the most promising technology given the abundance of local feedstock from cow manure, kitchen and food waste, and grass trimmings. They decided to pilot a digester but, instead of a reinforced concrete system, opted for locally available, cheaper, and easy-to-install material: plastic. This innovation even exceeded their expectations, hence they decided to scale up. A majority of network members now have their own plastic, floating dome digesters.

In parallel to addressing their cooking fuel challenges, the network also revived their solar photovoltaic systems for lighting and irrigation, ensuring this time that they have the necessary skills to maintain these technologies through training and capacity building in the community. These solar home systems have been used for generating electricity for lighting, providing electricity for small equipment and appliances, and for irrigating farms (field notes, November 2016).

Ten years after it was created, the Pa Deng case has now been described as a best moso practice in Thailand. Other moso networks have also come to visit and study these systems – not just the technical innovation but also the social arrangements that are built onto it. These social innovations include mechanisms for providing loans for network members who could not afford to purchase materials for a digester and/or a solar home system. Based on individual needs and capacities micro loans are granted to farmers who agreed to a repayment scheme. The system took advantage of the cost difference between the biodigester and regular fossil fuel costs which made it financially attractive in the long run. In addition, local farmers received training from more experienced farmers in basic system maintenance. They also learned to report a problem in order to have a trained person fix the issue. The network also developed and institutionalized a deliberative arrangement where network members meet once a month to collectively learn from experiences through exchange and decide on the network’s future development and priorities.

5.1.4. Perform prefigurative activism

The Pa Deng network is a prime example of a prefigurative type of activism where ordinary citizens participate and engage with activities
that advance an agenda for common good, while meeting their own, personal needs. As evidenced by this case, the imagination of local communities partaking in national development is not totally unknown and rare. The Pa Deng case exemplifies the mundane ways in which ordinary Thai citizens could live their lives and, at the same time, embed their lived experiences in the making of their country’s energy future. As expressed by local officials and farmers, a biodigester does not only decrease electricity costs, but also encapsulates a more participatory, democratic and independent mode of energy supply. Energy is framed as a local-level concern that needs to be tackled at the community level rather than waiting for a national solution.

Although the innovation described here is small compared to what is required for achieving Thailand’s energy transition, it offers an attractive case for enlisting similarly located citizen networks and opening up opportunities for scaling up community experiences; hence, prefiguring an alternative energy future.

5.2.1. National background

Ensuring a reliable and affordable energy supply, expanding access to electricity, and providing a fair and transparent playing field in the electricity sector are the Philippine government’s key energy priorities [68]. The electricity system has witnessed long-term processes of privatization and market liberalization as catalyzed through the 2001 Electric Power Industry Reform Act (EPIRA). Numerous regulators (such as the Energy Regulatory Commission, the National Electrification Administration, and the National Power Corporation) are overseeing the different parts of this fragmented electricity market [69]. Both fossil fuels (especially coal and oil) and renewable energy sources (mainly hydro power and geothermal), provide large shares to the electricity, and providing a fair and transparent playing field in the electricity sector are the Philippine government’s key energy priorities [68]. The electricity system has witnessed long-term processes of privatization and market liberalization as catalyzed through the 2001 Electric Power Industry Reform Act (EPIRA). Numerous regulators (such as the Energy Regulatory Commission, the National Electrification Administration, and the National Power Corporation) are overseeing the different parts of this fragmented electricity market [69]. Both fossil fuels (especially coal and oil) and renewable energy sources (mainly hydro power and geothermal), provide large shares to the Philippines’ last ecological frontier. Environmental groups raised concerns that the island’s UNESCO status would be threatened if any coal power plant goes online [72]. Government officials have even announced their ambition for a 100% renewable energy future for the island [73]. Such an imaginary of a long-term future to fully shift to renewables was linked to benefits such as the minimization of environmental harm and the creation of more jobs due to the more labor-intensive character of decentralized systems [74]. Yet, a coal-based energy agenda was advanced in Palawan banking on the promise of supply stability, affordability, and new grid connection (interview with an expert from the University of the Philippines, Diliman).

5.2.2. Local context

While national coal expansion plans are exceeding planned renewable energy development [27], few Philippine communities have managed to block the construction of new coal power facilities. Two of these communities are located in the municipalities of Narra and Aborlan in the province of Palawan. People in Palawan suffer from massive energy scarcity, and, compared to the Philippine capital, Manila, pay up to twice as much for electricity. More than half of barangays (villages) in Palawan remain disconnected from a stable electricity grid.

Palawan is renowned for its emphasis on environmental protection, nature conservation, and eco-tourism [71]. Having been declared as a UNESCO biosphere reserve in 1990, Palawan is labelled as the Philippines’ last ecological frontier. Environmental groups raised concerns that the island’s UNESCO status would be threatened if any coal power plant goes online [72]. Government officials have even announced their ambition for a 100% renewable energy future for the island [73]. Such an imaginary of a long-term future to fully shift to renewables was linked to benefits such as the minimization of environmental harm and the creation of more jobs due to the more labor-intensive character of decentralized systems [74]. Yet, a coal-based energy agenda was advanced in Palawan banking on the promise of supply stability, affordability, and new grid connection (interview with an expert from the University of the Philippines, Diliman).

5.2.3. Mobilize for an energy transition

In 2011, the Palawan Council for Sustainable Development’s (PCSD) approved two coal-fired power plants. PCSD consists of government and non-government organizations and was mandated by the Philippine Government to support plans and projects for sustainable development in Palawan. However, local social action groups, international environmental NGOs, religious groups, and universities rallied against these coal-fired power plants. While NGOs like Greenpeace provided information, community members were reached with the help of the church and through local political representatives who also refused coal power. The network’s strength, thus, was its diversity that helped to translate future negative effects into the local people’s current situation. In response, DMCI Power Corporation, the proponent of the coal power plant projects, announced in 2012 the construction of a relatively small powerplant with 15 MW capacity in Narra. This too was met with direct protests (interviews with PCSD, Greenpeace, and Katala Foundation Palawan). In June 2013, the Municipal Council of Narra adopted a resolution against DMCI’s proposal. Shortly after that decision, the PCSD withdrew its first approved coal power plant in Narra. Although not legally binding, the Municipal Council’s and the PCSD’s decisions sent a strong signal against coal power. But DMCI did not fully back out, instead, it shifted its attention towards Aborlan, a municipality north of Narra. Resistance, however, intensified as protestors from Narra, as well as from other regions, supported the local resistance in Aborlan [75] because it would “threaten the health and livelihood local farmers and fishermen” (interview with local barangay captains) in particular.

5.2.4. Perform prefigurative activism

The successful mobilization of communities against coal marked the first of its kind in Palawan. While the protests started locally, they quickly received significant support from a variety of actors. In Palawan’s capital city, Puerto Princesa, the Western Philippines University, for instance, organized a protest march that attracted approximately 1500 participants. The University’s College of Arts and Sciences Dean, Dr. Lita Sopsop raised her concerns about the project’s negative effects on human health and the environment due to the discharge of wastewater to nearby marine ecosystems [76]. The anti-coal protests were explicitly linked to campaigns against political leaders and capitalist industries, making it characteristically prefigurative. A local representative explained that “the protests are not only against coal. We also fight against our corrupt politicians and businesses that...
destroy our livelihood. A coal power plant destroys our community and our nature.”

Thus, the community-driven campaign against coal power in Palawan also reflects a more general dilemma in the Philippine economy at large, which is steadily growing, but has only little positive effects on unemployment rates or poverty eradication [77]. Inequality even increased in times of strong economic development [78]: i.e. poor people were affected by negative externalities as big conglomerates accumulated profits. These arguments were translated to the local context as community activists in Palawan raised their concerns about DMCi generating lucrative profits from burning coal, while the local population would be confronted with its negative health and environmental effects. “We catch fish almost every day, but a coal power plant is a serious threat to our fishing grounds. What should we do if the fish disappear?”[6], a local fisherman asked after he participated in a joint workshop with fishermen from other parts of the Philippines already affected by coal power plants.

These arguments and dystopian visions of a fossil fuels-based future stand in sharp contrast to a powerful national sociotechnical imaginary that links economic growth to progress and social development. The activists had also actively framed their fight against coal as an alternative vision for Palawan’s energy future, i.e. linked to the provincial government’s declaration of a 100% renewable electricity-powered Palawan. “Palawan is renowned for its healthy environment and remaining rainforests,” a Greenpeace interviewee explained, “The province must resist coal power and fulfil its own vision of a 100% renewable energy future.”

5.2.5. Expand beyond the local context

The proposed coal power plant also unveiled power struggles among multiple jurisdictional levels in the Philippines [79]. While the national Department of Energy (DOE) welcomed the proposed projects as cheap alternatives to address Palawan’s electricity needs, the PCSD (chaired by Palawan’s Governor) was accused for its apparent non-transparent dealings when it approved the proposed Aborlan plant. In contrast to these political institutions which symbolize “corruption, nepotism and non-democratic governance” (interviewee from the University of the Philippines Diliman), the anti-coal power movement prefigures social change by envisioning and advocating a more democratic, socially just, and environmentally friendly energy system.

The anti-coal protests also led national officials like the country’s former Climate Change Commissioner Naderev Sano to publicly announce their opposition to coal, assuring that “we can still stop this.” The local anti-coal movement also reached out to international environmental organizations and intensified its cooperation with the Catholic Church after the release of Pope Francis’ encyclical Laudato Si in 2015 [75]. “Environmental protection is framed as preserving God’s creation. This has become a powerful argument against coal and receives increasing support from Catholic priests and bishops around the country,” a Greenpeace representative explains.

Palawan’s local anti-coal movement suggests that community energy systems are not only linked to basic needs (such as in the Thai case above), but also to alternative and radically democratic practices of dissent. By creating new forms of community through collective protests, the movement was able to challenge the general energy service structure that dominates the Philippine energy landscape. In opposing coal power development, local activists had provided and constructed alternative visions of an energy future, one that is not based on fossil fuels provided by large conglomerates but could be largely based on decentralized renewable energy systems. Although this alternative imaginary has become a collectively held and publicly performed desirable vision at the Narra and Aborlan anti-coal protests, this imaginary continues to compete with the dominant and stabilized national sociotechnical energy imaginary in the Philippines, which puts heavy dependence on coal and is linked to a strong private sector with minimal regulatory interference.

Linking coal power to economic development, national institutions together with local elites have been fostering a strong pro-coal narrative that has been relatively stable over the last decade. In a townhall meeting in Aborlan a local politician expressed his skepticism about renewables “that cannot deliver reliable and cheap electricity which is needed to develop our communities.” Nevertheless, a coal-based vision of the energy future has been increasingly questioned and criticized locally, where coal power plant developments are frequently confronted with persistent and well-organized resistance by farmers, fisherfolk, and other affected groups, including indigenous people. However, these protests are often incapable of preventing the construction of fossil fuel-based power plants [80]. One example is the Aboitiz-owned 300 MW coal power plant in Davao City in southern Philippines, which was approved by the City Council despite resistance from local organizations, religious groups, and environmental NGOs. In 2014, the same Council also approved plans for additional 345 MW coal capacity [81]. Yet, local citizens and social action groups, alongside international NGOs, have been running campaigns against coal power facilities all over the Philippines to raise awareness, allow for knowledge exchange, and create networks, especially among affected groups to prevent the proposal or commissioning of coal power plants and coal reserves from being mined [80].

6. Discussion

Both cases reveal insights into the role of social movements and imagined energy futures for sustainable energy transitions in the Global South. The Thai case study is an example of prefigurative activism, where its proponents foster social change by embodying the ideals of a desired energy future. The case rejects the conventional understanding that energy has to be externally provided by rigid, often centralized, grid-connected energy systems or by an external donor. Instead, citizens are committed to democratize and localize their energy generation through an institutional arrangement that allows community engagement. Known for its vibrant civil society, the Philippines offers a second case study that demonstrates how direct, community-based social mobilization against coal power took shape and developed over the last decade. The case illuminates how a broad anti-coal movement in the adjoining municipalities of Narra and Aborlan can effectively prevent – or at least significantly delay – the construction of these power plants. Based on these empirical observations, we present the similarities and differences between the two case studies from a comparative angle following the analytical categories presented in Section 3.

6.1. Envisioning

The envisioning processes include the construction of desired futures side by side with advances in technologies. In the Philippines, the goal at the municipal level to prevent the construction of a coal-fired power plant is linked to a macro-level vision, which includes not only environmental pursuits but also broader social change and the empowerment of marginalized groups. Protests in Aborlan and Narra were embedded into an eco-friendly environment, where the alternative visions of an energy future different from the national government’s pro-coal and energy intensive development narrative became more pronounced than in other parts of the country. In Thailand, the Pa Deng mobilization for community energy offers a new vision of the future of energy supply (and its transition) arising from a necessity (i.e., farmers need cheap fuel alternatives). Community-level engagement proved to be durable when the energy project was sustained as a community project. Both cases offer an alternative view about how energy futures can be designed and pursued through small-scale, citizen-led, community-oriented energy projects (as in the Thailand case) and advanced using community-mobilized dissent through direct action (as in the Philippine case). Both cases counter a traditionally held notion that policy-making has to be the sole province of national governments;
instead, they demonstrate that visions of energy futures can also be produced from the fringes (i.e., the rural). Their nationwide implications, however, remain to be seen. In Palawan, local dissenters linked their goals to broader questions of development and priorities (environment versus development), showing that prefigurative elements encapsulate radical alternative visions of the future. The Pa Deng case similarly illustrates that social development priorities can run side by side with the vision of a techno-economic development, albeit one that puts premium on village economies. Both cases, thus, show how social innovations can also be located within new technological assemblages.

6.2. Performance

The process of resistance and engagement in Narra/Aborlan and Pa Deng include social experimentations that contest established power relations. In Palawan, the process of prefiguration and the construction of alternative visions of the future was grounded in a coalition built at the local level, but gradually expanded to the national and even to the global level – mainly through individual actions. Collective coalition building occurred when local protestors successfully sought allies with similar visions of a desirable future beyond their localities. The Thailand case was largely performed and driven by ordinary farmers and housewives, marking a process of social experimentation. Despite moso networks having the semblance of being state-sanctioned, the Pa Deng case illustrates how ordinary citizens could play a central role in performing a sustainable, community-based energy transition. The materiality of this Thai sociotechnical innovation first gained traction through daily interactions amongst neighbors, gradually expanded through learning and sharing exercises, and was eventually used as a model for possible replication across similarly oriented rural networks (interestingly by agents of the state, i.e. the Ministry of Energy, see below). Replicating this process, however, is not without challenges. Although moso networks across Thailand are situated almost along similar socio-economic-cultural landscape, each of them remains contextually different. The Pa Deng case, indeed, might be an innovative outlier, which may not be sustained in the future. Nevertheless, the case best illustrates that coalition-building is possible beyond the boundaries of institutionalized state- or non-state mechanisms and that it can arise internally from amongst the ranks of ordinary citizens.

6.3. Consolidation

Consolidating and institutionalizing efforts remains the most challenging part in both cases. The process of consolidation involves not only the material diffusion of technologies (as shown in the Pa Deng case) but also social transformations (as shown in both cases), where new norms and conduct of social behaviors are embedded in collective psyches. The Palawan anti-coal protests were successfully embedded into an eco-friendly environment; but these processes still unveiled a power struggle between activists and established elites particularly with an environmentally friendly organization like the PCSD. Protestors continue to grapple with institutionally much more stabilized visions that highlight the need for economic growth and development with the help of fossil fuels. Such a perspective predominates political decisions even at the PCSD. This open conflict reveals that despite having established and sustained a desirable vision of the future that stands in contrast to a coal-powered economy, the durability and eventual success of such an alternative vision represents an ongoing struggle and one that can never be guaranteed. Although the vision is collectively held at different levels, it has yet to be institutionally stabilized. In Thailand, the vision propagated and nurtured in Pa Deng has been slowly embedded into a national energy imaginary. Indeed, the national government and particularly the Ministry of Energy had actively promoted the project and recognized it as a best practice example. This process of consolidation, however, remains marginal compared to the dominant national imaginary which prefers to focus on Thailand’s energy security and energy connectivity in a fossil-fuel-dominated energy system.

The ultimate evidence of consolidation for the cases in Pa Deng and Narra/Aborlan would ideally be their replication beyond their local contexts. Despite signs of interaction with national and even international stakeholders such a claim would overestimate the actual reach of both cases. Instead, the local orientation resonates with existing scholarly debates. Smith and Twidwell [18] have, for instance, demonstrated how social movements in the United States are able to advance a normative agenda, but largely remain local and context-specific. They argue that the strong imaginary of job opportunities attached to certain forms of energy production “remains ‘bounded’ at a local scale rather than circulating more widely (i.e. consolidating) to gain national or international traction” ([18], p. 327). This leads to a conflict between local imaginaries and national policy-making. We, too, see some semblance of “bounded imaginaries” in both cases presented here, where certain narratives have successfully consolidated at the local level but not necessarily in the national narratives, which remain, to some extent, impervious and static. The gaps between local contexts and national priorities have led to conflicts and protests as seen in the Philippines, and in the treatment of a community energy initiative in Thailand as a micro- or niche-level innovation unworthy to dominate an energy imaginary. Yet, fissures have started to open in the national-local divide. The former Philippine Climate Change Commissioner’s public support for the fight against coal in Palawan and the support for replication provided by Thailand’s Ministry of Energy towards the Pa Deng innovation are only two examples of consolidation-in-the-making. It remains to be seen whether these fissures can be sustained in ways that local energy transitions can ultimately fracture the hegemony of currently fossil fuels-dominated national energy imaginaries in these countries.

Prefiguration and the envisioning of energy futures are not at all linear processes, but rather complex dynamics that do not necessarily follow all three phases we described here in the same way at a given time. For example, the Pa Deng case shows overlaps in the processes of consolidation and performance. Envisioning reoccurs and is not limited to the beginning of the innovation process. By being malleable, its performers have found value in reflexivity, i.e., citizens regularly revisiting their intentions, objectives, and thrusts. This process of reflection opened up new opportunities for experimentation and learning – which is key to the sustainability of the innovation itself. Further empirical studies are needed to shed light on these highly complex and context-specific endeavors.

7. Conclusion

“Nothing advances theory better than tackling a practical problem by integrating different perspectives” ([82], p. 33). In this article, we experimented with two different streams of literature with similar epistemological assumptions, i.e. STS and social movement studies [83] to explore the role of envisioned futures for energy transitions. Although the suggested framework (section 3) has clear limitations in terms of predictive power, the conversations between STS and social movement studies can be fruitful and “even potentially transformative […] for both fields” ([34], p. 76). We were able to contextualize the social movements’ actions and link their visions of the future to their ideas of social order through prefigurative activism. Issues like democratization, self-government, and a more decentralized market structure were constantly attached to renewable energy (in Thailand) or the fight against coal (in the Philippines) and thus deserve further investigation.

Social movement studies have allowed us to point at elements of practical action that could affect the discourses and narratives related to sociotechnical imaginaries. We have shown that living radical alternatives to dominant energy systems can be described as sociotechnical imaginaries in action. Acknowledging these alternatives seems promising in shedding light on the processes that do or do not
lead to the establishment and institutionalization of a sociotechnical imaginary. The apparent neglect of policy support on community-oriented, prefigurative energy transition processes limits the potential for designing desirable and sustainable energy futures often because they are not well documented. We, therefore, suggest using narrative case studies that would bring these stories to fore to help policy designers better understand these micro-dynamics and small-scale shifts so that they could be embedded in formal policies and institutions.

We presented two cases of how local, citizen-led, community-oriented initiatives can construct alternative visions of the future of energy systems in two rapidly developing countries. These vision-making processes are already being discussed in STS and social movement studies, but largely independently. Here, we considered them in conjunction with each other. While the micro-characteristics of these initiatives may still not appeal to policy-makers whose preference for large-scale development interventions continue to define processes of energy future-making in many governments, this article, nonetheless, establishes the role of counter-narratives, alternate visions, and dissenting imaginaries on energy transitions that can be spurred locally. We have shown how citizens and communities possess the capacities to perform these imaginaries and, at the same time, prefigure energy transitions. While we see substantial action on the ground in terms of renewable energy development, these initiatives can hardly be linked to large-scale energy transitions. The attribution gap, indeed, remains a major challenge in energy transitions research. To be clear, we do not argue that small-scale, local shifts would inevitably lead to considerable, nationwide energy transitions; rather, we have explored how alternatives to or resistance against fossil fuels can potentially disrupt or challenge the dominant energy narrative.

Alternative visions of energy futures produced by prefigurative activism can be disruptive and become serious threats to established energy imaginaries. Since these imagined alternative futures enable citizens to question power dynamics and rethink society and social order at large through active engagement and performance at the community level, movements such as those observed in rural Thailand and the Philippines constantly face power struggles. Empowering them would require multiple assemblages of tools, yet the ultimate aim is to organize numbers to wield political power [36,37]. Prefigurative activism should not be separated from fields like technology assessments, the social impacts of energy choices, or the power of social protest; rather, their potential has to be explored in conjunction with each other, both in scholarship and policy-making. While numerous in-depth studies have investigated the sociopolitical complexity of energy transitions in the Global South (e.g. [84–86]), we suggest to reimage and conceptualize energy futures in the Global South as complex processes intertwining technological development, power struggles, and societal change.

Acknowledgments

The authors are grateful to the substantial comments provided by Cynthia Barakatt, Kamilla Karhunmaa, Alex Mankoo, Geneva Smith, and Stefan Schäfer. We would also like to thank the three anonymous reviewers who have significantly improved this article with their comments. Errors and/or omissions remain ours.

Appendix A

Table A1
Interview partners in Thailand.

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<th>Organization</th>
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<th>Date</th>
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<td></td>
<td>Mae Tha community</td>
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Table A2
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