



Politicizing energy justice and energy system transitions: Fossil fuel divestment and a “just transition”[☆]

Noel Healy^{a,*}, John Barry^b

^a Department of Geography, Salem State University, 352 Lafayette St, Salem, MA USA

^b School of History, Anthropology, Philosophy and Politics, Queen's University Belfast, Northern Ireland, UK

ARTICLE INFO

Keywords:

Energy justice
Fossil fuels
Divestment
Just transition
Energy politics
Climate change

ABSTRACT

The burgeoning energy justice scholarship highlights the importance of justice and equity concerns in the context of global decarbonization and the transition to a green economy. This paper seeks to extend current conceptualizations of energy justice across entire energy lifecycles, from extraction to final use, to offer an analytically richer and more accurate picture of the (in)justice impacts of energy policy decisions. We identify two key areas that require greater attention and scrutiny in order to enact energy justice within a more democratized energy system. First, we call for greater recognition of the politics, power dynamics and political economy of socio-technical energy transitions. We use the example of the fossil fuel divestment movement as a way to shift energy justice policy attention upstream to focus on the under-researched injustices relating to supply-side climate policy analysis and decisions. Second, the idea of a “just transition” and the distributional impacts on “and the role of” labor in low-carbon transitions must be addressed more systematically. This focus produces a more directly political and politicizing framing of energy (in)justice and a just energy transition.

1. Introduction

Limiting the danger of climate change requires a rapid transition from fossil-fuel energy, agro-food and transport, to low-carbon systems based on green technologies and new infrastructures, policies, consumer practices, cultural meanings and scientific knowledge. Concurrently, there is increasing inequality – of income, wealth and resource ownership. Inequality of access to safe and affordable energy is rising, as is energy poverty, even in affluent nations. There is therefore a need to consider whether, where and how policies aimed at decarbonizing the economy can address the range of injustices and impacts of such a socio-energy transition.

The burgeoning energy justice scholarship highlights justice and equity concerns in the context of global decarbonization, climate change and the transition to a green economy (Sovacool, 2014; Sovacool and Dworkin, 2015; Jenkins et al., 2016a, 2017; Sovacool et al., 2017). Despite its growing popularity and increasing application, there remains a need for more energy justice literature to consider the full extent of justice implications across entire energy lifecycles. In this sense, our paper responds to calls from others, who have identified a neglect of how energy justice is constructed, understood and tackled across a range of scales, supply chains and related systems such as food

and transportation (Gagnon et al., 2002; Florini and Sovacool, 2009; Goldthau and Sovacool, 2012; Walker and Day, 2012; McCauley et al., 2013; Heffron and McCauley, 2014; Sovacool et al., 2017). This paper seeks to complement that growing body of energy justice literature which addresses energy supply chains (Heffron and McCauley, 2014), calls for ‘whole energy system’ approaches (McCauley et al., 2013; Jenkins et al., 2014, 2016a), and political economy analysis of energy (in)justice (Jenkins et al., 2016b).

Specifically, we identify two key areas—a “just transition” and the role of divestment in the political economy of energy transitions —, which require greater attention and scrutiny in order to enact energy justice within a more democratized energy system. We argue that the idea of a just transition and the distributional impacts on and the role of labor in low-carbon transitions should be addressed more systematically in energy justice analyses. Here, we call for greater recognition of the potential and perceived socio-economic costs of decarbonizing policies, which can hinder democratic/popular support for those policies. These include the negative impacts on fossil fuel energy workers and communities affected by a decarbonization energy transition. Without an energy justice dimension decarbonization strategies run the risk of ‘locking in’ patterns of exploitation and dispossession that characterize the current global political economy, even while

[☆] This article is part of a Virtual Special Issue entitled ‘Exploring the Energy Justice Nexus’.

* Corresponding author.

E-mail address: nhealy@salemstate.edu (N. Healy).

seeking to overcome carbon ‘lock in’ (Unruh, 2002). Here it is essential that social costs are taken into account as part of any just energy transition (Newell and Mulvaney, 2013). Recognizing the importance of a just transition and political economy questions within conceptualizations of energy justice means critical questions of:

‘who wins, who loses, how and why’ as they relate to the existing distribution of energy, who lives with the side effects of its sites of extraction, production and generation, and who will bear the social costs of decarbonizing energy sources and economies (Newell and Mulvaney, 2013: 2).

An obvious but important point here is that a just energy transition is intensely political—not simply a technological or indeed a socio-technical matter. Indeed, since it is characterized by issues of power, distribution of and access to resources, political economy, and so on, it can be described as a deeply political struggle.

This leads us to our second argument. Some energy justice literature underemphasizes the political economy of socio-technical energy transitions, particularly surrounding extraction. Key to a full energy life cycle analysis, we argue, is greater recognition of the politics, power dynamics and political economy of socio-technical energy transitions (Goldthau and Sovacool, 2012), which addresses underlying causes and not simply identifying the unequal or unjust consequences of the energy system. Without attention to power, political economy and politics, tensions between “decarbonization” and “justice” will continue (Finley-Brook and Holloman, 2016). While a number of scholars assert that politics is a critical component in the transitions approach, it is largely missing from much of existing analysis of socio-technical energy transitions and the energy justice literature (Meadowcroft, 2005, 2009; Smith and Stirling, 2007; Baker et al., 2014; Jenkins et al., 2016a). Instead, a narrow focus on policy management (often focused on energy technologies or an energy fuel focus) characterizes much of the literature, reflecting a “tendency towards techno-economic determinism” (Lawhon and Murphy, 2012) and a reformist-incrementalist approach, as opposed to disruptive and systemic-structural socio-energy transformations (Scoones et al., 2015).

Increasing calls for disruptive interventions illustrate a new political reality that energy policy decision-makers must now confront, especially in the context of stimulating large-scale and rapid energy transitions. Here the identification by Sovacool et al. (2017) of deliberative resistance to energy injustice is complemented by our analysis of the fossil fuel divestment movement, which often sharply brings this resistance to the fore. We use the divestment movement as a way to shift energy justice policy attention upstream to focus on the under-researched injustices relating to supply-side climate policy analysis and decisions (Lazarus et al., 2015) (e.g., fossil fuel subsidies and exploration permits), and to the human health and labor impacts of fossil fuel extraction, including intergenerational and intragenerational justice climate issues. The upstream focus re-orientates attention and responsibility to a new set of actors and relations that may be responsible for energy injustices. This political economy focus produces, we suggest, a more directly political and politicizing framing of energy (in)justice and a just energy transition. This reframing, Princen et al. (2013) and Barry et al. (2015) suggest is where the real power, politics, and political economy are located. We believe greater recognition of the political economy of socio-technical energy transitions, and the role of labor are necessary for the realization of a ‘just energy transition’.

2. Democratizing energy system transitions: political pathways for delivering energy justice

Global energy systems are shaped by a political economy in which the interests of elites and powerful actors are more often than not misaligned with the energy needs and environmental vulnerabilities of

the world’s poorest people (Newell and Mulvaney, 2013). Changes in energy regimes therefore must address inequalities in power and injustices across entire socio-energy systems. Yet energy policy design rarely incorporates justice dimensions. Miller and Richter (2014: 76) highlight how major national energy policy and planning documents concentrate almost exclusively on energy technologies, while social considerations tend to be narrowly economic, focusing on energy prices, jobs and, to some extent, energy access. As a result, energy policy and planning systematically fail to recognize broader social and economic assemblages surrounding energy systems, while energy engineers, economists and bureaucrats dominate energy policy design and implementation. Thus, a central but often overlooked dimension, energy justice, addresses the serious and conflict-laden normative and ethical issues raised by energy extraction, production and consumption (Miller et al., 2013; Jenkins et al., 2017).

However, following Barry (2012), a politicized and *realpolitik* understanding of a just energy transition should begin from a sober recognition that it is *energy injustice* (at different scales and domains) that characterizes our situation, just as it is “actually existing unsustainability” that we face (as opposed to “sustainable development”). The fight against injustice is not necessarily the same as outlining some positive conception of justice. As Simon rightly suggests, “injustice has a different phenomenology from justice... *injustice takes priority over justice*” (Simon, 1995: xvii; emphasis added). It is this reframing of our starting point as one focused on energy injustice, unsustainability (and lack of democracy)—as opposed to energy justice, sustainability and democracy—that makes the approach to energy transition a much more radical, systemic and politically oppositional project. Thus for us, the highly politicized character of a ‘just energy transition’ is precisely what we see in the divestment movement, which we understand as a response to actually existing *unsustainability* and *energy injustice*.

While climate justice centers on the causes of climate change and the unequal distribution of the negative impacts of climate change, the energy justice literature places a big emphasis on the provision of safe, affordable and sustainable energy for all (McCauley et al., 2016). Sovacool (2013) define energy justice as a global energy system that fairly disseminates both the benefit and costs of energy services, and one that has representative and impartial energy decision-making.

However, due to the implications of climate justice suggesting large-scale and structural changes to the socio-energy system, Heffron et al. (2015) contend that decision-makers find it difficult to relate it to the dominant discipline within policy formulation: namely, neoclassical economics, which is allergic to normative claims of justice and injustice (Barry, 2012). Thus, climate justice has had limited traction in policy formulation, even while receiving rhetorical support from those who make the policy decisions.

A lack of attention to the justice implications of decarbonization policies and the links between energy justice and climate can be partly attributed to weak and fragmented energy governance and analyses (Dubash and Florini, 2011; Goldthau and Sovacool, 2012), alongside a policy preference for avoiding or downplaying justice claims. Whole energy systems are rarely governed in a comprehensive and systemic fashion (Jenkins et al., 2014, 2016a). Identifying, diagnosing and redressing the unequal costs of energy transitions across multiple levels of governance and supply-chains that stretch across different political jurisdictions is a challenging task for publics, researchers and decision-makers alike (Miller and Richter, 2014). Thus there is a need for greater examination of how energy justice is constructed so that decision-makers, citizens and other actors can identify and address the unequal distribution of costs, risks and vulnerabilities across entire energy lifecycles—supply chains, production, distribution and waste chains, and therefore a fortiori, energy system transitions (Jenkins et al., 2016a). Such a whole system and lifecycle approach draws attention to the dominant global carbon energy regime’s multiple, but largely hidden or occluded, social, economic, health and environmental externalities across the entire life cycle from extraction to final disposal

(Jenkins et al., 2014). Also under- or unrecognized are this energy regime's democratic and justice infringements in decision- and policy-making, and unequal relations of political economy power, use, access to and ownership of energy (Meadowcroft, 2009).

Energy policy decision-makers now also must confront a new political reality: publics are increasingly attentive to energy and therefore energy decision-making (Miller et al., 2015) and there are growing calls for greater democratic voice and involvement. This, according to Barry : 20) et al. (2015), produces “a reconfiguration of ‘transition arenas’ from spaces for ‘coalitions of frontrunners’ towards more open spaces for such deliberation, dialogue and participation”. However, existing energy policy processes, from power plant siting planning decisions to the design of energy legislation, tend to limit rather than expand public participation and engagement (Miller et al., 2015).

The divestment movement, discussed below, has enabled broad democratic involvement, particularly youth participation in institutional energy-related investment decision-making and attempts at disruptive systemic-structural (institutional and political economic) socio-energy transformations. The movement's strong focus on the ethical, (including intergenerational justice), ecological and economic limits and risks of “business as usual” energy policies can bring experts and citizens onto common ground. A key feature of divestment is an explicit foregrounding of the claim that given the long-term risks of climate change, meaning intergenerational as well as social justice must be at the heart of any decarbonization transition. At the same time, the spatial focus (i.e. distributional justice) of divestment's entire energy life cycle perspective also ensures attention to “global justice” concerns, and how the costs of extraction, consumption and eventual disposal of fossil fuel wastes are unevenly distributed across different populations around the world.

2.1. Democratizing energy system transitions: fossil fuel divestment

A major element of the divestment campaign revolves around undermining the “social legitimacy” of the carbon socio-energy system, thus explicitly directing attention to normative issues such as political economy power, equity and ideology. The challenge is that many energy consumers, analysts and policy-makers frame energy and climate risks in a de-ethicized and depoliticized vacuum, silent on issues of social (in)justice or democratic processes (Sovacool et al., 2016). Instead, what is required is a move beyond these so-called objective and normatively ‘neutral’ rational choice-cum-behavioral and technological-expert decision approaches. Divestment, in calling for a full ‘life-cycle’ political economy analysis of energy draws attention to the full range of actors, dynamics and interests that are behind energy extraction, production and final use, including environmental externalities.

Avoiding the worst effects of dangerous climate change requires a radical step-change away from the current energy order. Ensuring a just energy transition with accessible, affordable and sustainable energy for all requires large-scale, radical and disruptive transformation. And given the central, foundational character of a society's socio-energy system, any change from one energy system to another leads to different social, political and economic order (Barry et al., 2015; Mitchell, 2013). We therefore contend that *a just transformation of the socio-energy system is also a decision to live in a different type of society, not simply a low-carbon version of the current one.* “Biofuelling the hummer” (Barry, 2016) is not, we hold, what just, sustainable and democratic energy transitions are about. Radical changes in the energy order therefore must be related to both decarbonization attempts and energy justice considerations.

Hence, energy justice research should reflect more on the way the existing “carbon regime” and incumbent actors resist, frustrate and slow down transitions to a low-carbon socio-energy regime (see Geels, 2014; Sovacool et al., 2017). Change in such systems or regimes must address inequalities in power and especially recognize the multiple

sources of the power of incumbent energy-producing actors. In the US, for example, fossil fuel corporations help shape US energy policies and influence energy transition options, effectively ensuring carbon lock in from which of course they benefit. Overcoming this carbon lock-in requires confronting corporate energy power. Thus, a central element in the socio-energy transformation is thus a clear recognition of the often “dirty politics” involved in clean energy transitions (Barry et al., 2015), and that alongside “disruptive technological innovation” we also need disruptive and confrontational political action. The divestment movement stands as a prime example of such confrontational and disruptive political innovations. Demands to “keep it in the ground” (the movement's motto) offer a different political register for energy justice than the top-down management of energy technology development and diffusion (as one finds in much of the socio-technical energy transitions literature). While most analysis of low-carbon transitions focus on green energy niche innovations, the fossil fuel divestment movement shifts attention to the resistance by the incumbent fossil fuel regime as the most significant obstacle to fundamental changes in energy systems.

Fossil fuel divestment is a climate change initiative that calls for institutions and individuals to sell stock-market-listed shares, private equities or debt from firms investing in fossil fuel. Originating on American college campuses in 2011, the fossil fuel divestment movement has prompted over 732 institutional commitments and over 58,000 individual commitments to divest from the fossil fuel sector across 76 countries (Fossil-Free, 2017). Students rallied around the divestment movement for several reasons, including: the international community's failure to implement the transformative action required for radical and immediate emission reduction; frustration with political gridlock around US climate policy; and a recognition of the need for urgent systemic change (see Healy and Debski, 2017). The movement uses a range of strategies to publicly “name and shame” and encourage individual and large institutional investors to divest from fossil fuel stocks (Ayling and Gunningham, 2015). This strategy, which has precedent in divestment campaigns against tobacco, Sudan (Darfur genocide), and South Africa during apartheid, aims to remove the “social license” by which fossil fuel companies operate, through reputational damage and stigmatization, as well as demonstrating the negative social and environmental impacts of fossil fuel dependence. *Thus, divestment explicitly seeks to delegitimize fossil fuels.* It also draws increased attention to the risk of “carbon stranded assets”—stocks that become obsolete due to fossil fuel deposits that cannot be extracted or sold. In summary, the divestment movement draws attention to the urgent need to halt fossil fuel exploration, extraction and production, end fossil fuel subsidies, and also publicly acknowledge and tackle fossil fuel industry-funded climate denial and corporate energy lobbying on climate and energy policy.

The movement aims to initiate the phasing out of fossil fuels (and the socio-technical practices associated with them being extracted, processed, refined and consumed as energy, including associated ways of life and conceptions of “the good life”), resulting in a structural shift in the economy, consistent with the “energy revolution” advocated by the International Energy Agency (IEA, 2009: 3) and climate science. This energy revolution proposes reorienting an energy system currently dominated by fossil fuels. Ultimately this necessitates leaving approximately 33% of oil reserves, 50% of gas reserves, and over 80% of current coal reserves in the ground by 2050 (McGlade and Ekins, 2015). Yet fossil fuel companies spent an estimated \$674 billion seeking new reserves in 2012 (Leaton et al., 2013). *In this way fossil fuel divestment and “keeping it in the ground” is energy justice in that it addresses and seeks to highlight and right energy injustice—with divestment understood as a necessary disruptive political economy stimulant for a just energy transition.*

For Unruh, (2000, 2002) and Erickson et al. (2015a), a key concern with ongoing investments in fossil fuel extraction, supply, technologies and associated practices is carbon lock-in. That is, “once certain

carbon-intensive investments are made, and development pathways are chosen, fossil fuel dependence and associated carbon emissions will be 'locked in', making it more difficult to move to lower-carbon pathways" (Erickson et al., 2015a: 1). Once locked in, technologies and associated practices are difficult to displace and can *lock out* alternative technologies for extended periods, even when the alternatives demonstrate improvements. Significantly, the International Energy Agency (2013)) found that continued near-term (through 2020) investment in conventional technologies instead of low-carbon alternatives would increase investment costs fourfold in the longer term (Erickson et al., 2015b: 1).

The divestment movement can be placed within a broader context of socio-energy transformations viewed not simply as a technological, state-"steered" and market-driven process, but as intensely political struggles which include ideological, democratic as well as political economy dimensions (including cultural aspects). We contend that the divestment movement is one of the clearest expressions of the political struggle and antagonism that are central to understanding and analyzing low-carbon socio-energy transformations. It does this by declaring the end of the fossil fuel age and politically demanding the systematic and managed retirement of the current carbon socio-energy order over a number of decades.

Divestment thus has the capacity to "catalyze public discourse and facilitate a vast web of influence that could bring a shift in attitudes toward climate change and the fossil fuel industry" (Ayling and Gunningham, 2015: 11). In over 20 years of international climate negotiations (including Paris COP21), the issue of limiting fossil fuel extraction and production has been systematically ignored (Marshall, 2015; Monbiot, 2015). The result is a technocratic and monumental misframing of the climate crisis as a problem of excessive greenhouse gas (GHG) emissions that can be solved through technological change and voluntary international agreements. In contrast, approaches which explicitly seek to limit and then completely end fossil fuel extraction and production in the first place remain marginalized. For example, the phrase *fossil fuels*, conspicuously, does not appear once in the 2015 Paris Agreement. *Fossil Fuel divestment is thus reframing and transforming the terms and nature of the climate-energy debate. It inserts, inter alia, ethics, politics and political struggle, a greater sense of urgency, and, importantly, an entire energy life cycle perspective on fossil fuels into discussions of energy justice and a just energy transition.*

2.1.1. Upstreaming attention to externalities and supply-side policy

The divestment movement represents a distinctive voice and perspective on energy transition and climate politics in emphasizing the need to upstream our analysis and its acknowledgement of confrontation and conflict rather than the more dominant language of partnerships, cooperation and "win-win" solutions. It also directly confronts the underlying political economy and legitimacy of fossil fuels and that system's dependence on financial markets and finance capital, thus framing the energy transition in moral-political and political economic terms rather than pragmatic-institutionalist reformist and technological terms. One of its key features is its explicitly oppositional and virtually "un-cooptable" vanguard character, that is, its uncompromising stance which, *ceteris paribus*, is not easily amenable to negotiation and "trade-off". It shares this uncompromising character with other recent developments in the political economy of the transition from unsustainability, such as the "degrowth" movement (D'Alisa et al., 2015).

The divestment movement can thus inform energy decision-making by reframing energy and climate change as *always already* concerns of injustice and justice. Divestment and its associated Blockadia-style (Klein, 2015) attempts to block fossil fuel extraction at its source has drawn greater attention to the injustices and the multiple negative impacts of extraction, refining, production and distribution of energy, rather than merely energy supply/security fears, or climate injustice

impacts due to the burning of fossil fuels. The past few years in particular have seen the frontlines of potential extraction (and resistance) expand rapidly as a result of the buttressing of carbon lock in whether in relation to hydraulic fracturing for gas (i.e., fracking) (Willow and Wylie, 2014), the expansion of fossil fuel infrastructure (e.g., Keystone XL (Swart and Weaver, 2012)), the Dakota Access Pipeline (Healy, 2016) or struggles over deep sea drilling (Jernelöv, 2010).

Shifting our attention upstream to the extraction of fossil fuels thus draws new focus on the traditionally overlooked elements of the fuel cycle, for instance the human health impacts on coalminers, as well as the actors who organize extraction, processing, and distributing. For Princen et al. (2013), a *carbon energy* focus is reductionist, whereas a *fossil fuel* focus, they argue, "directs attention, analytic and eventually political attention, upstream" (p. 163). This fossil fuel focus draws attention to the ecological damage of extractivism and the human impacts of living and working in such degraded environments (Chomsky, 2016) and the fossil fuel energy system's 'sacrifice zones'. This upstreaming and whole life cycle approach allows us to see the multiple injustices of petro-violence and human rights abuses by petro-states, and the geopolitical instability caused by illegal wars and invasions for fossil fuels (e.g., Iraq). Indigenous peoples' movements, NGOs and trade unions have also mobilized to demand both procedural justice and distributional justice in defense of their land and ways of life from energy exploration and extraction, most recently evident in the resistance to the construction of the Dakota Access Pipeline on land sacred to the Standing Rock Sioux Tribe (McKenna, 2016).

2.2. Democratizing energy system transitions: labor and a just energy transition

The energy justice literature pays insufficient attention to the concept of a "just transition", a strategy originally proposed by global labor unions. One of the earliest formulations of the concept of a just transition stemmed from the 1980s US trade union movement in response to new regulations to prevent water and air pollution. The modest but visible influence of the labor movement at the level of international organizations, according to Stevis and Felli (2015: 33), can be seen in the collaboration of the International Trade Union Confederation (ITUC), the International Labor Organization (ILO) and the UN Environmental Programme (UNEP) in promoting "green jobs" as necessary elements of a just transition. In recent years the concept gained increased traction, for example incorporated in the outcome of the Rio+20 Earth Summit and more recently recognized in the preamble of the Paris Agreement: "the imperative of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities" (UNFCCC, 2015: 21).

Labor unions have historically sought to influence the distribution of benefits and harms within energy systems by advocating and seeking just distribution, recognition and participation largely within the existing fossil fuel (and nuclear) energy systems (Fraser, 2005; Rosenberg, 2010). This has often led to them defending fossil fuel (and nuclear energy) jobs against environmental arguments and moves toward a decarbonized energy system. Here we must recognize that a "jobs versus the environment/climate" frame has often dominated labor union energy transition thinking. These concerns need to be recognized, and here a just transition framing directs more policy attention to the creation of new jobs as fossil fuel based ones are phased out. In this way a just transition focus could helpfully facilitate greater capacity for communities to plan for low-carbon energy transitions.

Like other terms, the concept of a just transition has been left relatively open to multiple interpretations. More recent conceptualizations tend to go beyond a narrow, reactive focus on the labor/environment (or climate) nexus. Reyes (2015) contends that analysis

of just transition is now moving beyond unionized workers to the “underemployed”, from fossil fuel “extreme energy” dependence to resilient “local living economies”. The latter are modeled around goals that include zero waste, the promotion of regionalized food systems (itself connected to the energy system), community-based renewable energy (energy democracy), public transportation, affordable and energy-efficient housing, ecosystem restoration (p. 4). Here the just transition strategy overlaps with debates around ‘green new deals’, ‘Green Keynesianism’, and movements towards a ‘circular economy’.

A just transition could require that the state intervene more actively in the political economy to create jobs in “green” sectors, in part to compensate for now-abandoned fossil-fuel-based sectors, and that state and capital (and those more able to pay higher associated taxes, for example) absorb carbon capitalism’s negative social externalities, and provide a welfare safety net and adequate compensation for people and communities that have been marginalized or negatively impacted by a low carbon energy transition. Such an approach also helps make questions of justice and equity more central to the debates over socio-technical transitions. The challenge, Newell and Mulvaney (2013) argue, is that technological innovation and the search for new sites of capital accumulation can produce injustices in surprising and unpredictable ways, including around the development of ‘clean’ (low-carbon) technologies (Zehner, 2012). For instance, Chomsky (2016) points out that when the La Guajira coalmines in Colombia eventually close, ten thousand workers and dependent communities will be turned into a new form of “ecological refugee”.

There is also a strong ‘realpolitik’ or strategic-political concern at stake here. Unless strong policies are advanced to support a just transition, fossil fuel dependent communities will inevitably resist rapid decarbonization, and there is some evidence we have seen this in some of the communities and areas in the US that voted for Donald Trump (Saha and Muro, 2016). Here we contend that a labor-justice expanded focus on decarbonization policies (e.g. labor impacts of coal plant decommissioning) could contribute to a more systemic and comprehensive analysis of energy justice and injustice. For example, while of course contested and contestable, the fossil fuel divestment literature does recognize the need for a managed and planned energy transition, to put in place compensatory measures for displaced and unemployed workers and communities, so a sustainable energy system is not achieved at the cost of injustice. That is, it is not enough to simply advocate for divesting from fossil fuels without also having thought through the non-climate, non-environmental social and economic impacts of that divestment strategy. As the Centre for Alternative Technology notes, “Many of the divestment campaigns have a ‘divest to reinvest’ element, which advocates using the funds invested in fossil fuel companies to reinvest in socially and environmentally beneficial projects, such as low carbon and renewable schemes or social housing” (Centre for Alternative Technology, 2017: 235).

To alleviate these social costs, a just transition approach focuses, for example, on contaminated sites that should be remediated, and on the transition to clean production and sustainable economies. Hence a just transition approach would be strengthened by restorative justice perspectives —identified by Heffron and McCauley (2017) as useful assessing how injustice caused by an energy activity or transition would have to be rectified. Also, part of any just transition must be the recognition of the potential emergence of “energy sacrifice zones” (Hernández, 2015), Chomsky’s post-fossil fuel “ecological refugees” (2016), and the forward policy planning needed to either prevent these or mitigate for them and other unequal costs of any low-carbon energy transition. An example here is Germany, which, when it dramatically reduced the burning of coal to generate electricity in the 1990s, used widespread programs to retrain coal industry workers to find new jobs, sometimes in renewable energy (Miller et al., 2013).

Just transition advocates have emphasized the need to ensure that new jobs created in low-carbon sectors provide decent working conditions, pay a living wage, and are accessible to people with a range

of skills, while providing clear career progression opportunities (Bird and Lawton, 2009). The distribution of new jobs and economic opportunities in the green economy has come under increasing scrutiny. For example, Finley-Brook and Holloman (2016) report that African American workers are largely being left out of the US solar boom, accounting for only 5.2% of positions in 2015 despite making up 11.7% of the workforce. What is more, the authors contend that California’s giant unregulated solar market profits from exploiting unskilled laborers (The Solar Foundation, 2016), while much of US decarbonization strategies appear prone to manipulation through political interference or industry influence. Job creation is clearly a poor proxy for a just transition—what matters more is the kinds of jobs, how secure they are, how long they last, and related forms of community resilience and innovation in the face of dynamic energy markets (Miller et al., 2015).

Resistance to the dominant fossil fuel energy system from labor groups and grassroots organizations is already occurring. In Boston, for example, the Green Justice Coalition (an amalgamation of community groups, labor unions and environmental groups) effectively campaigned to restructure statewide programs to bring home energy-efficiency upgrades and jobs to Boston’s low-income communities of color. The coalition also secured subsidies and outreach programs that make home weatherization more affordable and accessible to marginalized communities; increased retrofitting of public buildings in low-income communities; won increases in wages and job standards for weatherization workers; and is currently working to address discrimination against minorities and women by trade unions, as well as barriers to hiring people with criminal records (i.e., Criminal Offender Record Information) (Grant, 2013). Just as with race, we contend that more attention also needs to be paid to the potential gender and class inequalities of any low-carbon energy transition. In this regards, energy justice scholars can garner much through exploring injustices through a lens of intersectionality (Kajiser and Kronsell, 2014; Osborne, 2015) something which Sovacool et al. (2017) identified as missing from existing energy justice frameworks.

Fossil fuel divestment and a just transition policy approach reframe energy transitions as a task of rebuilding the economy from the ground up. Both are compatible with and promote “energy democracy”, understood as involving democratic participation of citizens in any energy transition and also using that transition to promote and achieve greater democratic political economy control over energy by citizens and communities as integral components of the low-carbon transition (Trades Unions for Energy Democracy, 2012). The divestment movement’s explicit political and oppositional strategy and tactics in calling for the ending of fossil fuel energy is at the same time a democratic intervention to “change the conversation” in what have been up until now technological, expert-driven and conventional economics-based discussions on energy and energy transitions. Relatedly, and evident in the divestment movement’s entire energy life cycle and oppositional approach, is the recognition, acceptance and indeed strategic encouragement of “political struggle and contestation” (necessary disruptions), but also of placing such socio-energy transitions within a democratic “conflict resolution” framework (Barry and Ellis, 2010). That is, another aspect of the divestment movement’s democratic credentials is it’s embracing of a view of democracy and democratically induced energy changes as motivated by non-violent disagreement, and emphasizing (politicized) contestation rather than pursuing technocratic (depoliticized) solutions based around “win-win” consensus.

Equally, a just transition approach is another aspect of an energy democracy (and “energy citizenship”) framing, one in which having greater democratic ownership and control of energy is central. Given the decentralization of energy (and electricity in particular) that can be achieved with the decarbonization of energy systems, this offers great potential for the re-localization of the economy around human-scale enterprises rooted more closely in the communities they serve (Reyes, 2015).

3. Conclusions and policy implications

Political action by civil society will be required to accelerate the phased ending of the fossil fuel era. More than that, it must end it in such a manner that the transition to a low- or post-carbon energy future minimizes injustices of that transition and maximizes its democratic character. It can and should do this through reframing fossil fuels as having now reached the point where their continued use is destructive, biophysically and ecologically unsustainable, perpetuates injustices, secrecy, lack of transparency and accountability—and propagates major geopolitical tensions. Divestment is thus a disruptive political and discursive intervention whose aim is to explicitly, democratically and deliberatively shift the current socio-energy regime to a new one.

In all of this, a focus on energy justice and injustice is central. The recognition of this should set the general policy frame along a path where more specific and localized energy policy decisions should be made. In this way, explicitly delegitimizing carbon may offer a way to unlock our energy system from fossil fuels, by systematically articulating its multiple negative impacts. These range from considerations of environmental injustice to the communities exploited and harmed at the points of fossil fuel extraction, to how powerful carbon energy actors undermine and corrupt democratic politics.

Rejecting or criticizing arguments for divestment and a just transition as “utopian” and “unrealistic” is often a way of avoiding politics (Barry, 2016). The odds are still heavily stacked in favor of continuing the dominant fossil fuel regime, and it is highly probable that governments (not least the new Trump administration or a likely Conservative Party government in post-Brexit UK) will ignore the evidence from climate science to “keep it in the ground”. Even accepting this as a very real probability, it is a mistake to reject as “naïve” or “wishful thinking” those hundreds of thousands of people, organizations and movements that do struggle for divestment and a just transition, and perhaps it tells us more about those who make such criticisms. While it is understandable to reject politics, the idea that democratically organized citizens and movements cannot reform, transform and engender societal and energy transitions is to leave oneself exposed to the false lure of the “pragmatic” and the “realistic”—by which we mean to settle for piecemeal and often token gestures in the hope that such small “win–wins” will lead to greater changes.

Thus, responding to some of the challenges raised by the Special Issue's editors (Jenkins et al., 2017), this paper makes the case for explicitly politicizing energy justice and calling attention to the unsustainability and injustice of the incumbent fossil fuel energy system. And this politicized framing is at one and the same time an invitation to take seriously a full life cycle analysis and whole carbon energy system approach. Policymakers and academics persistently overstate depoliticized techno-optimistic hopes that “green innovation” will suffice to achieve a transition to clean energy. While fostering technological innovation is important, we argue more critical research is needed on specific political economies of socio-technical energy transitions — in particular how existing fossil fuel actors obstruct decarbonization efforts, further embedding carbon lock in. Central to this is greater attention to understanding the impacts of ongoing investments in fossil fuel exploration, technologies and associated practices on any future capacity to address energy injustices. We also highlight the need for energy justice researchers to engage more with issues of labor — in particular policies, which examine the establishment of mitigation and compensation funds for fossil fuel dependent communities.

In relation to Jenkins et al. (2017) challenge of “learning from national policy contexts” the political space for civil society mobilization is country dependent and normative interventions to stigmatize/delegitimize the fossil fuel industry may alienate coalitions (communities, unions) in fossil fuel dependent regions (Green, forthcoming). Country-specific strategies must be tailored in order to create coalitions

between ecological and social movements, labor unions, communities of color, and energy sector workers. Policy makers in turn need to connect and tailor their policy making to local contexts, best done by including those communities and citizens in collaborative policy-making.

In response the “legal and regulatory contexts” (Jenkins et al., 2017): the legal foundation for institutional divestment lies in interpretations of fiduciary duty and responsible risk management, especially climate risk. Legal scholars are now warning fiduciaries that failing to consider climate risks in their investment decisions may place them at risk of breaching their legal duty (Franta, forthcoming). The divestment movement thus takes energy/climate justice out of the abstract and places it into the realm of institutional and personal investment decisions. A sharper focus on understanding, tracing and obstructing the financing of fossil fuels can draw attention to a new set of actors who can be held accountable for energy (in)justice and carbon lock in. For example, divestment advocates have played a role in disrupting financial flows to the Dakota Access Pipeline through directly targeting of banks and financial institutions that fund the project.

Energy justice research thus has the potential to shift public and political attention toward the under-researched and underemphasized supply-side climate policies such as: removal of producer subsidies, compensation of resource owners for leaving fuels “unburned”; halting fossil fuel exploration permits; and moving climate discourse upstream to the points of extraction and beyond an “end of the pipe” focus on carbon emissions (Princen et al., 2013). The climate focus on emissions reductions (on the demand side) has overlooked the need to reduce investments on the supply side, which would also include focusing more policy attention on energy reduction, efficiency and conservation.

A major and positive policy innovation would be to end subsidies to produce fossil fuels that could alter the price of fossil fuels disadvantageously (i.e., fully internalize current externalities in the price of carbon energy) and thereby improve the cost-effectiveness of alternatives. For example, fossil fuel subsidies could instead be transferred to developing nations so they can skip a whole generation of dirty energy, effectively leapfrogging carbon lock-in. Policymakers (and investors) could also consider undertaking analyses of carbon lock-in risk in their jurisdictions (see Erickson et al., 2015a) and begin to limit investments in technologies identified as posing the greatest risks, not least in terms of ‘stranded carbon assets’.

We also recommend policy actions that would undermine the “social legitimacy” or “social license” of the carbon socio-energy system, including economic and cultural practices and values associated with it—perhaps along the same lines as state action to delegitimize and minimize cigarette smoking or driving while under the influence of alcohol or drugs. At the same time an entire life cycle energy justice perspective shifts the focus from carbon emissions management to fossil fuels extraction management (Princen et al., 2013), and one of many political and policy options could be to campaign for the widespread uptake of “Fossil Fuel Depletion Protocols” (Campbell, 2013) in national or regional parliaments. This could range from mobilizations against the incumbent carbon energy system through divestment campaigns or parliamentary and party-political activities, to extra-parliamentary action from initiatives like the Carbon Disclosure Project, the UN Global Compact (UNGC), the UN Sustainable Stock Exchanges initiative (SSE), the Global Reporting initiative, ISO standards etc. These non-state initiatives can contribute to forms of social steering (Andonova et al., 2009) (e.g. consumer education, shareholder advocacy and engagement) thus complimenting the more direction action and political tactics of the divestment movement.

An obvious policy recommendation from the divestment movement is for corporations, governments, faith communities, trades unions, universities and citizens to support the “Keep it in the Ground” objective of divestment. A policy of fossil fuel divestment represents

a risk management strategy for major economic actors, potentially protecting investors and employees from the negative impact of “stranded assets” and employment risks. On the other hand, given the centrality of energy to life chances, aspirations, social order and so on, one cannot simply “keep it in the ground” without redirecting a wide range of factors (markets, subsidies, infrastructure, governance, individual behavior) to a more sustainable and just configuration. For example, **the introduction of the Keep It in the Ground Act to the US Congress in November 2015 illustrates how the divestment movement is paving the way for conversations about the political economy of fossil fuels and the potential social, political, and ecological implications of a future independent of fossil fuels** (Healy and Debski, 2017). However, it may be challenging to successfully implement many supply-side climate policies— particularly relating to stranded assets (e.g. Yasuni-ITT proposal in Ecuador, see Sovacool and Scarpaci, 2016), given the blocking power of fossil fuel actors and the sunk-cost and others advantages of the fossil fuel regime (Barry et al., 2015).

Nonetheless, it is clear that energy justice provides a new perspective on decision-making. Decision makers can apply energy justice principles directly to the formulation of new energy infrastructures. Greater attention to the specifics of distributive, procedural and recognition energy justice can thus play a role in “equality-proofing” and “democracy-proofing” decarbonization decisions. While an energy justice frame facilitates greater attention on policy at more micro scales in relation to particular sites or procedural issues (Fuller and McCauley, 2016), we propose that greater consideration be given to an entire life cycle energy (and therefore energy justice) perspective. Such an analysis could lay the foundation for decision-makers to create powerful multi-scale legal and policy instruments, particularly when integrated with broader recognition of human rights, and carbon lock-in assessments.

It is clear that we cannot stop using all fossil fuels overnight, something also recognized by the divestment movement. Governments and companies, together with civil society and citizens, should focus on forging a common vision and plan for the managed decline of the fossil fuel industry over decades, while ensuring a just transition for the workers and communities that depend on it (Mckinnon et al., 2016). Simultaneously dealing with the issues of climate and energy (in)justices necessitates new sources of finance, technologies, and major structural and disruptive changes. In this way, an entire life cycle energy justice analysis is necessary to bridge the “bigger picture” of climate justice with the more micro-scale dimensions of energy justice and localized just transitions. Part of this would be to present and develop policies around the energy transition as a new green industrial policy, not just to combat climate change or increase energy security. The German *Energiewende* stands as a real-world example of this (Morris and Jungjohann, 2016)—along with, we would add, the untapped and as yet unrealized potential of a “green new deal”, which overlaps as indicated above to the just transition perspective (UNEP, 2009).

We align with Stevis and Felli's (2015) view that the (at best uneven) “greening” of the labor movement, with its two centuries experience in advocating for just alternatives in complex political-economic situations, provides significant promise for transitioning to a low-carbon and indeed low-energy economy. For this to occur, direct investments in local economies dependent on fossil fuels should occur before devastating economic disruption begins; for this, mitigating and compensation funds should be established, ranging from guaranteeing the pensions for workers in the affected industries to retraining and relocation support for workers and collaboratively developing effective transition programs for fossil fuel dependent communities (Mckinnon et al., 2016: 43).

While divestment from fossil fuels is often dismissed as unfeasible, impossible and “too radical”, we contend that it stands as an absolutely necessary political strategy if societies are to decarbonize their current carbon-based socio-energy systems. Indeed, given the strength of

actors and dynamics currently locking us into a carbon energy regime, and the urgency of starting the decades-long process of energy decarbonization toward a low-carbon regime, such radical and system-disruptive interventions such as divestment are essential. Given that divestment starkly and unqualifiedly states that the fossil fuel era must end, it immediately brings into sharp (or indeed sharper) relief issues of energy (in)justice and democracy. *It does so by upstreaming our analysis to include injustices due to fossil fuel production (extraction, refining and distribution/ transportation) to complement issues of injustices in energy consumption.* A movement or policy to retire an entire industry cannot be credibly politically articulated—never mind succeed democratically—without paying attention or having one's attention drawn to the “winners” and “losers” of such a transition: that is, the distributional issues of who gains and who pays the cost, which calls for attention to energy (in)justice. But more than that, divestment and the stated policy direction of abandoning a fossil-fuel-based system also throws up procedural and decision-making issues of who decides, which calls for attention both to democracy in energy transition decision-making and to energy democracy.

Given that a society's socio-energy system shapes, enables and constrains the basic structure, possible ways of life, economic structure and so on of that society, any transition from one socio-energy regime to another is monumental in its multi-faceted and multi-scalar impacts (including unintended ones). If for this reason only, divestment and an appreciation of the political struggle at the heart of any energy transition process, together with the necessary interlinking of the issue of democracy, democratization and justice and injustice, mean that only a “just and democratized”, entire energy life cycle transition will do. Ecologically saving ‘sacrifice zones’ only to produce a new class or group of ‘sacrificed citizens’ is neither politically feasible nor normatively acceptable. Simply decarbonizing the *status quo* is not, in short, energy justice, and while such a narrow focus may achieve environmental sustainability, it may do so at the cost of bypassing both the claims of justice and democracy in the low-carbon energy transition. In short, overcoming “carbon lock in” cannot be at the price of “energy injustice lock in”.

Acknowledgements

The authors would sincerely like to thank the two anonymous peer-reviewers, Prof. Avi Chomsky, and Prof. Marcos Luna for their helpful insights in preparing this paper.

References

- Andonova, L., Betsill, M.M., Bulkeley, H., 2009. Transnational climate governance. *Glob. Environ. Polit.* 9 (2), 52–73.
- Ayling, J., Gunningham, N., 2015. Non-state governance and climate policy: the fossil fuel divestment movement. *Clim. Policy*, 1–15. <http://dx.doi.org/10.1080/14693062.2015.1094729>.
- Baker, L., Newell, P., Phillips, J., 2014. The political economy of energy transitions: the Case of South Africa. *New Polit. Econ.* 19 (6), 791–818. <http://dx.doi.org/10.1080/13563467.2013.849674>.
- Barry, J., Ellis, G., 2010. 'Beyond consensus?: agonism, contestation, republicanism and a low carbon future'. In: Devine-Wright, P. (Ed.), *Renewable Energy and the Public: From NIMBY to Participation*. Earthscan, London, 29–42.
- Barry, J., 2012. The Politics of Actually Existing Unsustainability: human Flourishing in a Climate Changed, Carbon-Constrained World. Oxford University Press, Oxford.
- Barry, J., Hume, T., Ellis, G., Curry, R., 2015. Low carbon transitions and post-fossil fuel energy transformations as political struggles: Analyzing and overcoming 'carbon lock-in'. In: *Energy & Environmental Transformations in a Globalizing World: An Interdisciplinary Dialogue*. second ed. Nomiki Bibliothiki, Athens, pp. 3–23.
- Barry, J., 2016. Bio-fuelling the Hummer?: transdisciplinary thoughts on techno-optimism and innovation in the transition from unsustainability. In: Byrne, E., Mullally, G., Sage, C. (Eds.), *Transdisciplinary Perspectives on Transitions to Sustainability*. Routledge, London, 106–124.
- Bird, J., Lawton, K., 2009. *The Future's Green: Jobs and the UK Low-carbon Transition*. IPPR, London.
- Campbell, C.J., 2013. Recognising the second half of the oil age. *Environ. Innov. Soc. Transit.* 9, 13–17. <http://dx.doi.org/10.1016/j.eist.2013.08.004>.
- Centre for Alternative Technology, 2017. Zero Carbon Britain: Making it Happen. CAT, Machynlleth, Powys.

- Chomsky, A., 2016. Labor and the environment in Latin America. In: Oxford Research Encyclopedia of Latin American History. (<http://dx.doi.org/10.1093/acrefore/9780199366439.013.327>).
- D'Alisa, G., Demaria, F., Kallis, G. (Eds.), 2015. *Degrowth: A Vocabulary for a New Era*. first ed. Routledge, London.
- Dubash, N.K., Florini, A., 2011. Mapping global energy governance. *Glob. Policy* 2 (s1), 6–18.
- Erickson, P., Lazarus, M., Tempest, K., 2015a. Carbon Lock-in From Fossil Fuel Supply Infrastructure. Stockholm Environment Institute, Seattle, 1–8.
- Erickson, P., Kartha, S., Lazarus, M., Tempest, K., 2015b. Assessing carbon lock-in. *Environ. Res. Lett.* 10, 84023. <http://dx.doi.org/10.1088/1748-9326/10/8/084023>.
- Finley-Brook, M., Holloman, E.L., 2016. Empowering energy justice. *Int. J. Environ. Res. Public Health* 13, 926. <http://dx.doi.org/10.3390/ijerph13090926>.
- Florini, A., Sovacool, B.K., 2009. Who governs energy? The challenges facing global energy governance. *Energy Policy* 37, 5239–5248. <http://dx.doi.org/10.1016/j.enpol.2009.07.039>.
- Fossil-Free, 2017. Divestment commitments. (<https://gofossilfree.org/commitments/>). (Accessed 28 May 2017).
- Franta, Benjamin, 2017. Litigation as a tactic in the fossil fuel divestment movement. Law & Policy, forthcoming.
- Fraser, N., 2005. Reframing justice in a globalizing world. *New Left Rev.* 36, 69–88.
- Fuller, S., McCauley, D., 2016. Framing energy justice: perspectives from activism and advocacy. *Energy Res. Soc. Sci.* 11, 1–8.
- Gagnon, L., Bélanger, C., Uchiyama, Y., 2002. Life-cycle assessment of electricity generation options: the status of research in year 2001. *Energy Policy* 30, 1267–1278. [http://dx.doi.org/10.1016/S0301-4215\(02\)00088-5](http://dx.doi.org/10.1016/S0301-4215(02)00088-5).
- Geels, F.W., 2014. Regime resistance against low-carbon transitions: introducing politics and power into the multi-level perspective. *Theory Cult. Soc.* 31, 21–40. <http://dx.doi.org/10.1177/0263276414531627>.
- Goldthau, A., Sovacool, B.K., 2012. The uniqueness of the energy security, justice, and governance problem. *Energy Policy* 41, 232–240. <http://dx.doi.org/10.1016/j.enpol.2011.10.042>.
- Grant, J., 2013. Building a Brighter Day: Energy Efficiency Innovations Yield High Returns for the Commonwealth. Community Labor United, Boston.
- Green, Fergus, 2017. Anti-Fossil Fuel Norms. Climatic Change, forthcoming.
- Healy, J., 2016. North Dakota oil pipeline battle: who's fighting and why. (http://www.nytimes.com/2016/08/27/us/north-dakota-oil-pipeline-battle-whos-fighting-and-why.html?_r=0) (Accessed 1 October 2016).
- Healy, N., Debski, J., 2017. Fossil fuel divestment: implications for the future of sustainability discourse and action within higher education. *Local Environ.* 22 (6), 699–724.
- Heffron, R.J., McCauley, D., 2014. Achieving sustainable supply chains through energy justice. *Appl. Energy* 123, 435–437. <http://dx.doi.org/10.1016/j.apenergy.2013.12.034>.
- Heffron, R.J., McCauley, D., Sovacool, B.K., 2015. Resolving society's energy trilemma through the Energy Justice Metric. *Energy Policy* 87, 168–176. <http://dx.doi.org/10.1016/j.enpol.2015.08.033>.
- Heffron, R.J., McCauley, D., 2017. The concept of energy justice across the disciplines. *Energy Policy* 105, 658–667.
- Hernández, D., 2015. Sacrifice along the energy continuum: a call for energy justice. *Environ. Justice* 8, 151–156. <http://dx.doi.org/10.1089/env.2015.0015>.
- International Energy Agency, 2009. *World Energy Outlook 2009*. OECD/IEA, Paris, 30.10.16.
- International Energy Agency, 2013. Redrawing the Energy-Climate Map: World Energy Outlook Special Report. OECD/IEA, Paris (<https://iea.org/publications/freepublications/publication/weo-special-report-2013-redrawing-the-energy-climate-map.html>). (Accessed 12 November 2016).
- Jenkins, K., McCauley, D., Heffron, R., Stephan, H., 2014. Energy justice, a whole systems approach. *Queen's Political Rev.* 2, 74–87.
- Jenkins, K., McCauley, D., Heffron, R., Stephan, H., Rehner, R., 2016a. Energy justice: a conceptual review. *Energy Res. Soc. Sci.* 11, 174–182. <http://dx.doi.org/10.1016/j.erss.2015.10.004>.
- Jenkins, K., Heffron, R.J., McCauley, D., 2016b. The political economy of energy justice: a nuclear energy perspective. In: *The Palgrave Handbook of the International Political Economy of Energy*. Palgrave Macmillan, London, pp. 661–682.
- Jenkins, K., McCauley, D., Forman, A., 2017. Energy justice: a policy approach. *Energy Policy*. <http://dx.doi.org/10.1016/j.enpol.2017.01.052>.
- Jernelöv, A., 2010. The threats from oil spills: now, then, and in the future. *Ambio* 39, 353–366. <http://dx.doi.org/10.1007/s13280-010-0085-5>.
- Kaijser, A., Kronsell, A., 2014. Climate change through the lens of intersectionality. *Environ. Polit.* 23 (3), 417–433.
- N. Klein, 2015. *Changes Everything: Capitalism vs. the Climate* 2015 Simon and Schuster, New York.
- Lawhon, M., Murphy, J.T., 2012. Socio-technical regimes and sustainability transitions: insights from political ecology. *Prog. Hum. Geogr.* 36, 354–378. <http://dx.doi.org/10.1177/0309132511427960>.
- Lazarus, M., Erickson, P., Tempest, K., Lazarus, M., 2015. Supply-Side Climate Policy: the Road Less Taken (Working Paper No. 2015–13). Stockholm Environment Institute International, Seattle, 1–24.
- Leaton, J., Ranger, R., Ward, Bob, Sussams, Luke, Brown, M., 2013. Unburnable Carbon 2013: Wasted Capital and Stranded Assets. Carbon Tracker and The Grantham Research Institute, LSE, London (<http://www.carbontracker.org/wastedcapital/>). (Accessed 17 December 2016).
- Marshall, G., 2015. Don't Even Think About it: why Our Brains are Wired to Ignore Climate Change. Bloomsbury, New York.
- McCauley, D., Heffron, R.J., Stephan, H., Jenkins, K., 2013. Advancing energy justice: the triumvirate of tenets. *Int. Energy Law Rev.* 32, 107–110.
- McCauley, D., Heffron, R.J., Pavlenko, M., Rehner, R., Holmes, R., 2016. Energy justice in the Arctic: implications for energy infrastructural development in the Arctic. *Energy Res. Soc. Sci.* 16 (1), 141–146.
- McGlade, C., Ekins, P., 2015. The geographical distribution of fossil fuels unused when limiting global warming to 2 °C. *Nature* 517, 187–190. <http://dx.doi.org/10.1038/nature14016>.
- McKenna, P., 2016. Dakota pipeline was approved by army corps over objections of three federal agencies. (<https://insideclimatenews.org/news/30082016/dakota-access-pipeline-standing-rock-sioux-army-corps-engineers-approval-environment>). (Accessed 30 August 2016).
- McKinnon, H., Stockman, L., Kretzmann, S., Scott, A., Turnbull, D., 2016. The Sky's Limit: why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production. Oil Change International, Washington, 1–60.
- Meadowcroft, J., 2005. Environmental political economy, technological transitions and the state. *New Polit. Econ.* 10, 479–498. <http://dx.doi.org/10.1080/13563460500344419>.
- Meadowcroft, J., 2009. What about the politics? Sustainable development, transition management, and long term energy transitions. *Policy Sci.* 42, 323–340. <http://dx.doi.org/10.1007/s11077-009-9097-z>.
- Miller, C.A., Iles, A., Jones, C.F., 2013. The social dimensions of energy transitions. *Sci. Cult.* 22, 135–148. <http://dx.doi.org/10.1080/09505431.2013.786989>.
- Miller, C.A., Richter, J., 2014. Social planning for energy transitions. *Curr. Sustain. Energy Rep.* 1, 77–84. <http://dx.doi.org/10.1007/s40518-014-0010-9>.
- Miller, C.A., Richter, J., Jason, O'Leary, 2015. Socio-energy systems design: a policy framework for energy transitions. *Energy Res. Soc. Sci.* 6, 29–40.
- Mitchell, T., 2013. *Carbon Democracy: Political Power in the Age of Oil* 2nd ed.. Verso, London.
- Monbiot, G., 2015. Why leaving fossil fuels in the ground is good for everyone (<http://www.theguardian.com/environment/georgemonbiot/2015/jan/07/why-leaving-fossil-fuels-in-ground-good-for-everyone>) (Accessed 27 March 2016).
- Morris, C., Jungjohann, A., 2016. *Energy Democracy: Germany's Energiewende to Renewables*. Palgrave, London.
- Newell, P., Mulvaney, D., 2013. The political economy of the “just transition”. *Geogr. J.* 179, 132–140. <http://dx.doi.org/10.1111/geoj.12008>.
- Osborne, N., 2015. Intersectionality and kyriarchy: a framework for approaching power and social justice in planning and climate change adaptation. *Plan. Theory* 14 (2), 130–151.
- Princen, T., Manno, J.P., Martin, P., 2013. Keep them in the ground: ending the fossil fuel era. In: *State of the World 2013*. Island Press/Center for Resource Economics, Washington, pp. 161–171.
- Reyes, O., 2015. Towards a Just Transition. Working Paper Draft. Institute for Policy Studies, Washington, 1–23.
- Rosemberg, A., 2010. Building a just transition: the linkages between climate change and employment. *Int. J. Labour Res.* 2, 125–161.
- Saha, D., Muro, M., 2016. Growth, Carbon, and Trump: State Progress and Drift on Economic Growth And Emissions 'Decoupling'. Brookings Institution, Washington DC.
- Scoones, I., Leach, M., Newell, P. (Eds.), 2015. *The Politics of Green Transformations*. Routledge, London.
- Simon, T.W., 1995. *Democracy and Social Injustice: Law, Politics, and Philosophy*. Rowman & Littlefield.
- Smith, A., Stirling, A., 2007. Moving outside or inside? Objectification and reflexivity in the governance of socio-technical systems. *J. Environ. Policy Plan.* 9, 351–373. <http://dx.doi.org/10.1080/15239080701622873>.
- Sovacool, B.K., 2013. *Energy & Ethics: Justice and the Global Energy Challenge*. Palgrave Macmillan, London.
- Sovacool, B.K., 2014. What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. *Energy Res. Soc. Sci.* 1, 1–29. <http://dx.doi.org/10.1016/j.erss.2014.02.003>.
- Sovacool, B.K., Dworkin, M.H., 2015. Energy justice: Conceptual Insights and Practical Applications. *Appl. Energy* 142, 435–444. <http://dx.doi.org/10.1016/j.apenergy.2015.01.002>.
- Sovacool, B.K., Scarpaci, J., 2016. Energy justice and the contested petroleum politics of stranded assets: policy insights from the Yasuni-ITT Initiative in Ecuador. *Energy Policy* 95, 158–171. <http://dx.doi.org/10.1016/j.enpol.2016.04.045>.
- Sovacool, B.K., Heffron, R.J., McCauley, D., Goldthau, A., 2016. Energy decisions reframed as justice and ethical concerns. *Nat. Energy* 1, 16024. <http://dx.doi.org/10.1038/nenergy.2016.24>.
- Sovacool, B.K., Burke, M., Baker, L., Kotikalapudi, C.K., Wlokas, H., 2017. New frontiers and conceptual frameworks for energy justice. *Energy Policy* 105, 677–691.
- Stavis, D., Felli, R., 2015. Global labour unions and just transition to a green economy. *Int. Environ. Agreem. Polit. Law Econ.* 15, 29–43. <http://dx.doi.org/10.1007/s10784-014-9266-1>.
- Swart, N.C., Weaver, A.J., 2012. The Alberta oil sands and climate. *Nat. Clim. Chang.* 2, 134–136. <http://dx.doi.org/10.1038/nclimate1421>.
- The Solar Foundation, 2016. *National Solar Jobs Census 2015*. The Solar Foundation, Washington, 1–66.
- Trades Unions for Energy Democracy, 2012. *Resist, Reclaim, Restructure: Unions and the Struggle for Energy Democracy*. Rosa Luxembourg Stiftung, New York.
- UNFCCC, 2015. Conference of the Parties (COP), 2015. Adoption of the Paris Agreement. Proposal by the President, In: *Paris Climate Change Conference - November, COP 21*. p. 32. doi:FCPC/CP/2015/L.9/Rev.1.
- United Nations Environment Program, 2009. *Rethinking the Economic Recovery: a Global Green New Deal*. United Nations Environmental Program, Nairobi.
- Unruh, G., 2000. Understanding carbon lock-in. *Energy Policy* 28, 817–830. <http://>

- [dx.doi.org/10.1016/S0301-4215\(00\)00070-7](http://dx.doi.org/10.1016/S0301-4215(00)00070-7).
- Unruh, G.C., 2002. Escaping carbon lock-in. *Energy Policy* 30, 317–325. [http://dx.doi.org/10.1016/S0301-4215\(01\)00098-2](http://dx.doi.org/10.1016/S0301-4215(01)00098-2).
- Walker, G., Day, R., 2012. Fuel poverty as injustice: integrating distribution, recognition and procedure in the struggle for affordable warmth. *Energy Policy* 49, 69–75.
- <http://dx.doi.org/10.1016/j.enpol.2012.01.044>.
- Willow, A.J., Wylie, S., 2014. Politics, ecology, and the new anthropology of energy: exploring the emerging frontiers of hydraulic fracking. *J. Polit. Ecol.* 21, 222–236.
- Zehner, O., 2012. *Green Illusions: the Dirty Secrets of Clean Energy and the Future Of Environmentalism*. University of Nebraska Press, Lincoln.