



Articulating system change to effectively and justly address the climate crisis

Diana Stuart, Brian Petersen & Ryan Gunderson

To cite this article: Diana Stuart, Brian Petersen & Ryan Gunderson (2022): Articulating system change to effectively and justly address the climate crisis, Globalizations, DOI: [10.1080/14747731.2022.2106040](https://doi.org/10.1080/14747731.2022.2106040)

To link to this article: <https://doi.org/10.1080/14747731.2022.2106040>



Published online: 31 Aug 2022.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



Articulating system change to effectively and justly address the climate crisis

Diana Stuart ^a, Brian Petersen^b and Ryan Gunderson^c

^aProgram in Sustainable Communities, School of Earth and Sustainability, Northern Arizona University, Flagstaff, AZ, USA; ^bDepartment of Geography, Planning and Recreation, Program in Sustainable Communities, Northern Arizona University, Flagstaff, AZ, USA; ^cDepartment of Sociology and Gerontology, Miami University, Oxford, OH, USA

ABSTRACT

Activists and world leaders increasingly call for bold climate action. Yet proposals remain far from the transformative systemic changes required. While many remain in denial that system change is necessary, others who call for system change fail to articulate what that change would entail. It is critical that the climate movement identifies and promotes specific strategies for change. Identifying synergistic proposals associated with ecosocialism and degrowth, we describe a set of policies, programs, and strategies that have the potential to justly minimize warming and that could become key demands of climate movement organizations attempting to influence governments in the Global North. While there are stigmas associated with ecosocialism and degrowth, the described strategies can be promoted without using these terms. Articulating specific strategies for system change is necessary to challenge the powerful actors and interests that continue to maintain the status quo and our current climate trajectory.

KEYWORDS

Climate; policy; global warming; degrowth; ecosocialism; system change

Introduction

Given the IPCC's (2018) *Special Report on 1.5 Degrees*, which stated that 'rapid and far-reaching' changes are necessary in *all* aspects of society, calls for system change became more and more common in 2019 and 2020. At protests spurred by Extinction Rebellion (XR) and Fridays for Future (FFF), initiated by Greta Thunberg, calls for system change were commonly written on protest signs, especially 'System Change, Not Climate Change.' In 2021, the 'code red for humanity' IPCC report further amplified calls for system change. We agree that systemic change is required to effectively address the climate crisis, yet at least two significant challenges currently stymie and constrain moving forward with the changes necessary.

First, many environmentalists remain in denial that system change is necessary, what we have called 'ideological denial' elsewhere (Petersen et al., 2020). The environmental movement at large continues to be blind, in a state of 'social denial' (Foster, 2015) – a denial that systemic changes are necessary as well as an inability to imagine or accept the possibility of such changes.

This includes those who believe that current and future technological tools will be sufficient to meet climate targets. Yet, an ongoing faith in technology remains a risky gamble, given a lack of evidence that industrial and technological development can be decoupled from carbon emissions at a rate and scale sufficient to meet global targets (Hickel & Kallis, 2019).

Second, within the ‘radical’ groups calling for system change, such as XR and FFF, a large gap remains between the complaints and discontent with the current system and any agenda that would result in meaningful change (Kenis & Mathijs, 2014; Stoner & Melathopoulos, 2016). As explained by Spash (2020), these ‘generalized complaints’ about the failures of the current system remain unspecific and therefore the agenda of climate activists remains ‘disconnected and incomplete.’

Regarding 30 years of failure to reduce greenhouse gas (GHG) emissions, Stoddard et al. (2021, p. 677) state:

What is strongly evident ... is how redirecting the rising trajectory of emissions toward Paris-compliant rates of decarbonization brings to the fore questions highly challenging to the dominant paradigm of ‘progress.’ The almost uncritical pursuit of economic growth, piecemeal politics, and a narrow, techno-economic rationality are fundamental characteristics of this paradigm. Furthermore, worldviews and perspectives that offer alternatives to this highly constricted development pathway have (thus far) tended to be marginalized, undermined, or otherwise ignored.

We argue that alternatives to the dominant paradigm of ‘progress’ will remain marginalized and ignored if these alternatives continue to be generic calls for ‘system change’ without any articulation of what this must involve. Many dominant climate movement organizations have thus far failed to articulate specific policies, programs, and strategies for system change. For example, XR’s demands remain ‘beyond politics’ as they call for governments to tell the truth about climate change and act boldly to reduce emissions without supporting any specific policies or programs. As pointed out by Spash (2020), these generic calls for change and action fail to connect with any agenda or program to facilitate change and also critically fail to confront the very real political powers that continue to protect the status quo.

These challenges stem in part from a societal inability to understand that different socio-economic systems exist and are possible to create through specific strategies. Trapped in ‘capitalist realism’ (Fisher 2009), the majority of people remain blinded to the reality that there are alternatives. However, how can society break free of capitalist realism if alternatives are not fully articulated or understood in concrete and tangible ways? Calls for ‘system change’ must get louder, but also *much* more specific. An understanding of specific structural policies and programs to create a new system remains a crucial, yet missing, element in the climate movement.

In this paper, we examine what specific policies and programs could be associated with the type of system change required to minimize global warming. Like Frase (2011), we are interested in what futures could be birthed from the current order, though we narrow our focus to alternative nearer-term futures that are explicitly proposed as positive pathways to address the climate crisis. As it represents the course we are currently on, for comparative purposes we also include a discussion of a ‘technocapitalist’ system which resembles the current system with increasing attempts to address the climate crisis with technology and continued pro-growth capitalist logic.

In the following sections, we first illustrate why maintaining the current trajectory and relying on technological fixes and pro-growth capitalist logic is dangerous and unlikely to result in just mitigation pathways. We then draw from scholarship associated with both ecosocialism and degrowth, to illustrate how scholars and activists have developed similar and synergistic proposals for deep structural changes to address that climate crisis. Rather than highlighting the differences between ecosocialism and degrowth, we emphasize specific strategies that overlap between the two literatures – with a unique focus specifically on addressing the climate crisis. We discuss each strategy and how it could be used to mitigate climate change – arguing that, based on the evidence, these specific strategies should be considered and pursued by climate activists in the Global North –

especially in over-consuming wealthy countries with the means but lack of political support to drastically cut emissions (e.g. the US, UK, EU, Canada, and Australia). While there are a growing number of climate activists in the Global South with different origins and agendas, we focus here on activists in the Global North in organizations like XR and FFF, who have been increasingly demanding ‘system change’ yet failing to articulate what this system change entails. We argue that demanding the specific policies and programs described here would help to increase the success of groups calling for bold climate action in national and state policy arenas.

A risky gamble: our current trajectory

The most likely policies to be adopted to address climate change, given the current political trajectory, will include further investments in renewable energy, energy efficiency, and technological development to mitigate climate change while continuing to increase levels of production and consumption (per person) to support a growing economy. However, there is a widely recognized positive correlation between increasing levels of production and GHG emissions. This relationship is often framed as unproblematic due to a widespread belief that technology can be successfully used to ‘decouple’ this relationship. The idea of growth with reduced environmental impacts is referred to as ‘green growth.’ We believe that technology is a necessary component of climate mitigation, but in a growing economy mitigation through technology will remain a constrained and partial solution that fails to justly minimize warming.

With its heavy reliance on techno-fixes while maintaining economic growth, green growth is one manifestation of ‘technocapitalism’ (Kellner, 2002). Capitalism is a *growth-dependent* system of ever-expanding production for the sake of increasing capital accumulation, a system that relies on economic growth (Wallerstein, 1979; Kallis, 2018). Kellner (2002) uses the term *technocapitalism* to describe capitalism’s increasing reliance on science, computers, automation, and information technology to accumulate capital, thereby increasing growth. We add here that technocapitalism also increasingly relies on developing and marketing technologies as *solutions* to the contradictions caused by its own internal dynamics. These technological solutions must fit within the constraints of the capitalist system and promote, or at least not hinder, economic growth. Promoting technological solutions to problems caused by *social* forces is a social reproduction strategy consistent with capitalist realism.

Relying on the principles of green growth and decoupling, supporters of technological solutions to climate change claim that through energy inventions, efficiency gains, and other technological breakthroughs we can mitigate climate change. First, while it is largely believed that the growth of alternative energy sources is replacing fossil fuels and creating an energy transition, Renewables are only minimally displacing fossil fuels and are generally being used in addition to fossil fuels (York, 2012; York & Bell, 2019). To maximize renewable energy’s potential to reduce carbon emissions, fossil fuels must be purposefully phased-out as the renewable sector expands. Second, efficiency gains continue to be partially and, in some cases, largely offset by increases in energy and resource use (York, 2010; York et al., 2011; York & McGee, 2016). While it is often assumed that improvements in efficiency will result in a decrease in total use, there is an association between efficiency gains and increased consumption (York & McGee, 2016). This phenomenon is often referred to as Jevons Paradox and also as the ‘rebound effect,’ or when the benefits of efficiency gains are partially or fully offset by increases in total use (Santarius, 2012). Due to these trends of increasing levels of energy and material use, efficiency gains are in many cases failing to result in lower total impacts. While renewable energy and energy efficiency are key tools to mitigate

climate change, increasing levels of material and energy use undermine the potential of these technological tools to reduce total GHG emissions.

The viability of the case for green growth requires absolute reductions in emissions despite economic growth (absolute decoupling). While evidence of decoupling depends on what is measured and over what time period (some trends are temporary), a recent review found that evidence of absolute decoupling of carbon emissions and GDP was identified in 32 countries for production-based emissions, 23 countries for consumption-based emissions, and 14 countries for both production and consumption-based emissions – with the authors concluding that ‘[e]ven countries that have achieved absolute decoupling are still adding emissions to the atmosphere thus showing the limits of ‘green growth’ and the growth paradigm’ (Hubacek et al., 2021). In addition, Haberl et al. (2020) state that, while absolute decoupling of both production and consumption-based emissions can be found in some cases, it is not occurring globally or at the rates necessary:

We conclude that large rapid absolute reductions of resource use and GHG emissions cannot be achieved through observed decoupling rates, hence decoupling needs to be complemented by sufficiency-oriented strategies and strict enforcement of absolute reduction targets.

To summarize, there has ‘never been a global pattern of absolute decoupling of CO₂ from economic growth’ (Parrique et al., 2019, p. 24). Further, if economies continue to grow, the likelihood of absolute decoupling occurring at the scale and pace necessary to meet climate targets is very low (Hickel & Kallis, 2019; cf. Anderson & Bows, 2012). It is not that transformations in energy and technology are misguided, but that technological changes are likely *insufficient* to meet climate targets (Schor & Jorgenson, 2019). With no evidence of the necessary rates of decoupling, this solution pathway remains a high-risk approach that maintains current power relations and prioritizes wealth accumulation over wellbeing.

An alternative solution: system change articulated

‘Policy should be made on the basis of robust empirical evidence, rather than on the basis of speculative theoretical possibilities.’ Hickel and Kallis (2019, p. 15)

We now draw from both ecosocialists and degrowthers to identify a set of structural policies, programs, and key levers for systemic change that evidence indicates are likely to effectively and justly minimize global warming. This is not meant to be a quantitative or systematic review of the literature, yet a discussion of clear overlaps and synergies that have emerged from different silos of scholarly analysis. Our discussion is informed primarily by recent literature associated with ecosocialism or degrowth that focuses on policies, programs, and initiatives to mitigate the climate crisis in the Global North. Discussions too often remain isolated based upon different disciplinary and theoretical origins and there is much to be gained from merging not only the ideas and strategies associated with degrowth and ecosocialism, but also infusing these ideas into the social movements that are pursuing emancipatory transformation (Liegey et al., 2020). Here, we further the understanding and discussion of these key strategies by (1) discussing how they have been articulated in both the degrowth and ecosocialist literatures, and (2) translating this into specific strategies that could be pursued by the climate movement. First, we briefly introduce ecosocialism and degrowth, but then focus exclusively on how scholars associated with each area have come up with largely complementary and synergistic strategies that could be adopted as key demands to be pursued by the climate movement.

Ecosocialism: communally living within ecological limits

Although there are differences between ecosocialists like Ted Benton, James O'Connor, Joel Kovel, John Bellamy Foster, Mary Mellor and others (e.g. see White et al., 2017; Foster & Clark, 2020: ch. 8), two common strands running through ecosocialism include (1) the argument that capitalism is inherently unsustainable and (2) a prescriptive case that socialism would allow society to produce to meet human needs within ecological limits. As an alternative to capitalism's structural necessity to increase energy and material throughput, ecosocialism has been defined as:

an attempt to provide a radical civilizational alternative to what Marx called capitalism's 'destructive progress'. It advances an economic policy founded on the non-monetary and extra-economic criteria of social needs and ecological equilibrium. Grounded on the basic arguments of the ecological movement, and the Marxist critique of political economy, this dialectical synthesis ... is at the same time a critique of 'market ecology', which does not challenge the capitalist system, and of 'productivist socialism', which ignores the issue of natural limits. [The aims of ecosocialism] require: (a) collective ownership of the means of production ('collective' here meaning public, cooperative or communitarian property); (b) democratic planning, which makes it possible for society to define the goals of investment and production, and (c) a new technological structure of the productive forces. (Löwy, 2007, p. 294)

In this definition, ecosocialism is a democratic socialism that recognizes natural limits and abandons the vision of socialism as an extension of the capitalist productivism. Collective ownership and democratic planning open the possibility of, though do not guarantee, an economy based around the production of *use values* that meet human needs and promote human flourishing within ecological limits (see Kovel, 2000). The guiding assumption is that democratically controlled firms free from the profit motive will collectively and discursively decide, with surrounding communities (Löwy, 2007), what should and should not be produced will be better positioned to take ecological impacts and social welfare into consideration. In addition to democratic planning and collective ownership, ecosocialism also entails work time reduction, advertising bans, and a society-wide transition to renewables and the phasing out of fossil fuels. These dimensions are returned to and expanded on below.

Degrowth: less is more

Degrowth has been gaining more and more attention in recent years. Giorgos Kallis (2017:, p. 10), one of degrowth's most vocal advocates, defines degrowth as 'an equitable down-scaling of production and consumption that increases human wellbeing and enhances environmental conditions.' Degrowth entails reduced material and energy throughput in the economies of wealthy or over-consuming nations to a steady state of sufficiency, while also helping nations in the Global South to more sustainably achieve an improved quality of life (Kallis, 2017). The overall goal of degrowth is not to reduce GDP; however, the changes required to reduce total material and energy throughput would contract the economy and reduce GDP (Hickel, 2019). Yet degrowth is not the same as a recession. The degrowth 'hypothesis' posits that wellbeing and quality of life can improve as total material and energy throughput decreases (Kallis, 2018). The underlying goal of degrowth is to equitably reduce total resource and energy use to a sustainable level that provides enough for everyone while staying within ecological limits. Jason Hickel describes the benefits of a degrowth transition in the book *Less is More* (2020), arguing we can save the world from ecological crises and improve wellbeing and quality of life. Others describe degrowth similarly as reorienting priorities from growth to wellbeing (Paulson et al., 2020). As Paulson (2017) explains:

degrowth call us to shift value and desire away from productivist achievements and consumption-based identities toward visions of good life variously characterized by health, harmony, pleasure and vitality among humans and ecosystems.

While degrowth scholars and activists have developed diverse interpretations of degrowth (Chertkovskaya et al., 2019; Liegey et al., 2020), much of the literature illustrates clear overlapping agendas. For example, Jarvis (2018, p. 7) states that ‘a degrowth perspective can be identified in the literature with respect to four transformations: extending human relations instead of market relations; deepening democracy; defending ecosystems; and realizing a more equal global distribution of wealth.’ Gabriel and Bond (2019, p. 328) identify three primary agendas of degrowth: (1) to decrease material and energy throughput, (2) to emphasize social justice, wellbeing, and inclusion, and (3) to create voluntary democratic channels to participate in decision-making. Degrowth thrives on the multiplicity of perspectives and approaches, yet core values include ‘care, cooperation, mutual aid, solidarity, conviviality, autonomy, and direct democracy’ (Barca, 2019, p. 4). Degrowth oriented policy proposals have been developed for national and international-level structural changes (Cosme et al., 2017). Overall, degrowthers offer a pathway to stay within global climate targets and increase wellbeing.

Articulating system change to minimize global warming

Drawing from both degrowth and ecosocialist scholars, we now examine overlapping and synergistic policies and programs that could serve as key levers to minimize global warming and create an alternative system with more just and sustainable outcomes. Any viable systemic alternative in overdeveloped/over-consuming countries must start from the following premises: (1) overall energy and material throughput must decline, (2) throughput is positively correlated with economic growth, and likely cannot be greened, and (3) capitalism has an inherent growth engine. Thus, ecosocialism and degrowth are perhaps the two best suited systemic alternatives to address the ecological crisis. After a brief discussion of the tensions and overlaps between ecosocialism and degrowth, we highlight specific, concrete policies advocated by both programs that we argue should be adopted as key demands by groups such as XR and FFF.

There has been a vibrant discussion between ecosocialists and degrowthers for around a decade (Andreucci & Engel-Di Mauro, 2019); however, it has largely focused on differences rather than commonalities. A common criticism of degrowth from a Marxist perspective is that degrowth has not developed a coherent theory of capitalism and, thus, cannot develop an adequate political response to its inherent growth engine (e.g. Foster, 2011). Some ecosocialists want to preserve concepts like ‘growth’ and ‘development,’ arguing that the meaning of these terms would qualitatively transform in an ecosocialist society (e.g. Vergara-Camus, 2019; cf. Löwy, 2007). Kallis (2019) argues that degrowth is inherently incompatible with capitalism and any socialist alternative should seek to simmer rather than fuel productivism.

Despite these debates, we agree with Andreucci and Engel-Di Mauro (2019) that there are important and fertile overlaps between degrowth and ecosocialism. In fact, the term ‘degrowth’ (*décroissance*) itself was coined by the proto-ecosocialist André Gorz (Kallis et al., 2015) and, for Kallis (2019), degrowth is ‘socialism without growth’ (Andreucci & Engel-Di Mauro, 2019). Further, a fundamental ecosocialist argument is that the unsustainability of capitalism is due to its inherent growth engine and, thus, either explicitly or implicitly agree with degrowth’s premise that overall production and consumption must decline to meet ecological targets.

The symbioses between ecosocialism and degrowth can be seen in two concrete political proposals: Richard Smith's (2019) ecosocialist plan to avoid catastrophic warming and James G. Speth's (2015; Speth et al., 2018) proposals to address the ecological crisis by reaching a 'new political economy.' The proposals are helpful illustrations here as one uses the terms 'ecosocialism' and 'degrowth' (Smith) while the other, supporting democratic control of the economy and reductions in total throughput, avoids using either term (Speth and colleagues). Smith (2019) proposes an 'Emergency Plan,' designed for the US, to stay with 1.5 C warming. The plan consists of four proposals: (1) phase out fossil fuels by nationalizing the fossil fuel industry as well as 'downstream' industries and those whose entire existence is dependent on fossil fuels (e.g. airlines), (2) a guaranteed jobs program for those who are put out of work, (3) a large-scale and rapid national development of renewables, and (4) a phase-out of ecologically destructive industries (e.g. arms production, single-use plastics, factory farming, etc.). Smith sees capitalist growth dependency as the primary obstacle to avoiding catastrophic warming and defends socializing massive corporations as opposed to small businesses and family farms. Speth et al. (2018, p. 2) argue, like Smith, that we need 'system change' to transition out of 'our current system of political economy.' They promote three strategies to begin transitioning out of current power structures that block climate action, all of which overlap with Smith's Emergency Plan: (1) buying out fossil fuel companies and phasing out fossil fuel production, (2) transferring energy utilities to public ownership and control, and (3) partnering with 'anchor institutions' (public or nonprofit institutions who have a long-term stake in communities, such as universities and hospitals) to fortify democratically controlled energy grids.

Here we highlight five policies and programs that both degrowthers and ecosocialists support as part of a solution pathway: (1) economic democracy, (2) work-time reduction, (3) energy democracy/energy cooperatives, (4) advertising restrictions, and (5) nationalizing and phasing out fossil fuel companies. Below we describe each of these strategies and explain why they will be key levers and programs for effective and just climate mitigation. We argue that through adopting these strategies as key demands, the climate movement could articulate what 'system change' entails and through this specificity increase awareness, support, and influence.

1. Economic democracy: Economic democracy refers to 'a system of governing firms in which direct control is redistributed ... out of the hands of the capitalists and into the hands of their workers' (Archer, 1995, p. 69). The democratic control of firms allows for the possibility of addressing environment problems: '[i]f work were under the control of workers, human work would be much more likely to be environmentally friendly, since under capitalism's property rules and the imperative of growth, labor is forced to be environmentally harmful' (Bayon, 2015, p. 191; see also Boillat et al., 2012; Johannisova & Wolf, 2012; Wolff, 2012, pp. 133–134; Gunderson, 2019). Democracy in the workplace or 'economic democracy' is critical for addressing worker alien expansion and increasing levels of production.

Models of economic democracy already exist and include worker control of privately-owned firms, worker control of publicly-owned firms, and worker control of worker-owned firms (e.g. worker-owned cooperatives). Worker decision-making power ranges from workers receiving a notification that a decision is being made to a majority representation in the forum or body that makes decisions (Archer, 1995; Schweickart, 1992; Boillat et al., 2012). In a democratic system, workers would directly participate in decision-making or have elected representatives participate in all decisions that have impacts on workers and the future of the firm. This includes schedules,

work speed, allocation of work duties, technologies and tools used, hiring and firing employees, product quality and quantity, profit-distribution, and investment (Schweickart, 1992).

The structure of economic democracy does not necessitate climate mitigation. For example, one of the long-known limitations of worker cooperatives is that they must, if operating in a larger capitalist system, conform to this system's pseudo-natural laws (e.g. Marx, 1981, p. 571). However, democracy in the workplace is a prerequisite to opening up more opportunities for changes in production systems. It can create conditions favorable to new priorities that allow for the shrinking of throughput in a socially just way (e.g. Boillat et al., 2012; Johanisova & Wolf, 2012). As Bayon (2015, p. 191) argues, '[i]f work were under the control of workers, human work would be much more likely to be environmentally friendly.'

2. Work time reduction (WTR): WTR is associated with significant reductions in GHG emissions, ecological footprints, and resource use (e.g. Rosnick & Weisbrot, 2006; Knight et al., 2013; Fitzgerald et al., 2015). Additionally, WTR has numerous social benefits such as increased autonomy and lower structural unemployment (Gunderson, 2019). By using productivity gains to increase social and ecological wellbeing rather than increase production, WTR may help address the underlying problem of climate change: capitalism's inherent growth engine (Stoner, 2020). WTR would involve reducing annual working hours to a new standard, without decreases in pay or loss of benefits, and would likely also involve work sharing models. Work sharing allows less hours worked while avoiding unemployment (Schor, 2015). As explained by Pullinger (2014, p. 14) there are multiple avenues for WTR including limiting the number of working hours per week, increasing holidays each year, increasing time for maternity and paternity leave, increasing sick leave, and offering pre-retirement transitions. While there are numerous identified social benefits associated with WTR (Heikkurinen et al., 2019), here we focus on WTR as a climate change mitigation tool, as it is associated with reduced GHG emissions (Knight et al., 2013).

Shorter working hours involve lower rates of production and reduce pressure on resource and energy use. WTR can result in reduced total energy use, as working hours are associated with energy consumption (Fitzgerald et al., 2015). Rosnick and Weisbrot (2006) estimate that if working hours were reduced instead of using productivity gains for increased production, the US would consume 20% less energy. Rosnick (2013: 124) also posits that if we reduce working hours 0.5% annually over the next century we can 'eliminate about one-quarter to one-half, if not more, of any warming that is not already locked in.' In general, because longer working hours are associated with increased carbon emissions, ecological footprints, and energy use, WTR represents a potentially powerful climate change mitigation strategy.

It is important to recognize that WTR does not necessary guarantee reduced carbon emissions because leisure could conceivably be spent doing more environmentally harmful activities like shopping or travel (Knight et al., 2013; Gunderson, 2019). Advertising restrictions (see below) are one way to counteract this possibility and to help encourage low-impact activities. However, with economic democracy and WTR there would likely be more diverse goals, less marketing and advertising, and less pressure on individuals to consume unnecessary goods. More free-time also allows for the self-provisioning activities that are low-impact but do take more time.

3. Energy democracy/energy cooperatives: Energy democracy is a three-prong project centered around popular sovereignty over, participatory governance of, and civic ownership of energy

systems (Szulecki, 2018). Most fundamentally, energy democracy is a movement to reformulate social structures and consciousness in ways that allow energy to be treated as a commons instead of a commodity (Martinez, 2017). A centerpiece of energy democracy is the expansion of renewable energy cooperatives or community energy projects, like those growing primarily in the EU (e.g. Kunze & Becker, 2015).

Existing energy cooperatives and related community energy projects have been shown to allow for carbon emissions reductions while meeting social needs (Kunze & Becker, 2015). However, like economic democracy (see above) and fossil fuel nationalization (see below), the collective ownership of energy systems does not guarantee reductions in carbon emissions. As Kunze and Becker (2015) put it, '[i]n contrast to conventional private corporate ownership, public and collective ownership opens up possibilities for the social and ecological transformation that degrowth is calling for, though it does in no way automatically guarantee the implementation of such goals' (Kunze & Becker, 2015, p. 427). Like economic democracy, energy democracy, precisely because it is collectively governed, is more adaptable to goals beyond constant energy increases (Byrne et al., 2009). Energy-democratic models of ownership and decision-making provide the blueprints for how to meet energy needs justly and effectively in a future society in which fossil fuels are almost wholly absent (Gunderson et al., 2018).

4. Advertising regulation: Advertising restrictions are critical for reducing carbon emissions driven by the production/consumption growth engine. Marketing not only restricts human freedom by controlling and stupefying consciousness (e.g. Marcuse, 1964), it also contributes to ecological destruction by greasing capitalism's need to produce for the sake of producing (e.g. Löwy, 2007, p. 303f). Galbraith (1958) long ago identified how advertising plays a key role in creating the desires that fuel consumption. Advertising and the media are used to create 'false needs' through manipulation (Marcuse, 1964). Debord (1983) called them 'pseudo-needs' created specifically to maintain the growing economy. Advertising influences individuals' perceptions of themselves and their social status, compelling them to buy products to address manufactured dissatisfaction (Horkheimer & Adorno, 1969). Buying alternatives and 'voting with your dollar' supports a belief that through different purchasing one can alleviate negative impacts, yet still fuels over-consumption.

Banning advertising for harmful or status commodities could significantly help reduce overconsumption. Other restrictions could include banning advertising in public spaces (Hickel, 2019a) or restricting advertising to only certain formats and media sources. While advertising takes on many forms (internet, television, radio, signs, and more), current restrictions on products such as cigarettes illustrate that successfully restricting marketing is possible at a large scale. Advertising restrictions also complement other proposals discussed above: democracy in the workplace would likely reduce the imperative to advertise, and reduced advertising would help ensure that increased free-time due to WTR did not result in increased levels of consumption.

Advertising regulation may also be a vehicle for challenging capitalist realism. As Serge Latouche (2015, p. 120) argued, 'denouncing the aggression of advertising' is a 'starting point' for stepping out of the restricted imaginary of late capitalist societies. In addition, Marcuse (2013, pp. 245–246) similarly stated that 'the mere absence of all advertising and of all indoctrinating media of information and entertainment would plunge the individual into a traumatic void where he would have the chance to wonder and to think, to know himself ... and his society.'

5. Nationalizing and phasing out fossil fuel companies: Because it is unlikely that fossil fuel companies are going to stop extracting on their own, nationalizing and phasing out oil, gas, and coal companies is one route to keeping fossil fuels in the ground (e.g. Gowan, 2018a; Aronoff, 2019). This approach also allows for a just transition of workers to new forms of employment in, for example, renewable energy. In addition to fossil fuel companies, nationalization may be a potential strategy for phasing out other carbon-intensive industries in a way that reduces harm done to workers and more justly transitions them to other industries (Smith, 2019).

Alperovitz and others (2017) detail a policy proposal similar to the 2008 financial crisis response: creating new money ('quantitative easing'), but instead of bailing out banks, using the money to buyout fossil fuel companies. They argue that government buyouts are not uncommon and have occurred throughout US history, including the buyout of tobacco companies between 2004 and 2014. Gowan (2018a) also proposes nationalizing fossil fuel companies, which he states has already been proposed in the United Kingdom and is taking place in Norway. He explains that, according to US takings laws, governments can purchase fossil fuel companies at market value. Gowan (2018a) states that purchasing 51% of fossil fuel shares (a majority stake) would cost about \$410 billion and argues that this cost is small compared to the long-term costs of the climate crisis.

Conclusion

Many politicians remain tied to vested interests and therefore promote capitalist realism and small reforms to a broken system. This power has yet to be meaningfully challenged, as the climate movement continues to lack the power necessary. Changing the system requires taking power, as it is unlikely that politicians who aggressively defend the status quo are going to install a serious mitigation program. An important step in gaining power is articulating clearer and concrete 'first steps' through which a systemic transition can occur.

The climate movement increases its chances of gaining power if it identifies and promotes clear policies and programs to effectively and justly address global warming. While they are certainly raising awareness, concern, and participation in activism, even the most well-known leaders in the climate movement continue to call for system change without describing how the system should change and why. For example, Bill McKibben (2019) explains, 'I don't know the final destination. While I don't know how to change the 'system,' the urgent nature of the climate crisis doesn't let us simply put off action.' Yet what do actions demanding system change accomplish if they are not coupled with at least a minimal conception of a desired destination? It is not surprising that most of McKibben's focus, along with the majority of environmentalists, remains on divestment and increasing renewable energy sources – minor tweaks and reforms to the system of increasing production and consumption. In 2019, Greta Thunberg told the United Nations, that 'if solutions within the system are so impossible to find, then maybe we should change the system itself.' System change rhetoric is at the heart of the climate movement, yet there remains a vast gap between demanding that the system must change and identifying how specifically it needs to change, why, and how we get there (cf. Kenis & Mathijs, 2014).

We agree with many others that significant changes must be made to the current social and economic structures of society to justly address the climate crisis – in other words, we strongly agree that system change is necessary. The Next System Project and The Great Transition Initiative are two online sources with many compelling cases for system change as well as specific policy

proposals and structural changes to create a new system. As Speth (2015:, p. 11), one of the co-founders of The Next System Project, clearly explains:

The current system is simply not programmed to secure the well-being of people, place, and planet If we are to escape the crises now unfolding all around us, we must create a new system of political economy where outcomes that are truly sustainable, equitable, and democratic are commonplace. This is certainly one of the most important tasks any of us can engage in at this moment in history ... and system change is not starry-eyed but the only practical way forward.

However, Speth (2015:, p. 25) also explains that when events open up pathways for addressing these crises, we must be ready with ‘system-changing initiatives’ and that ‘means having those initiatives well-developed and supported by large and active constituencies.’ When a window of opportunity for bold action opens, specific policies, strategies, and programs – such as the five described here – must already be articulated and widely supported.

We do not assume a transition to a post-capitalist society would be without challenges or surprises, yet there are many social and ecological co-benefits of taking the first steps towards a transition through adopting the specific strategies outlined here. Focusing on specific strategies that lead us towards system change might also prove more successful than a focus on immediate, revolutionary system change, especially without a revolutionary subject. Historically, we see many failed attempts to transition to socialism, including societies that endeavored to create an economic model akin to what we mean by socialism here (i.e. public ownership and democratic control of the means of production), from the Soviet Union crushing Czechoslovakia’s attempt to democratize state ‘socialism’ in 1968 to the Swedish Social Democratic Party’s failure to transfer the ownership of firms to workers at the height of Sweden’s social democracy (Gowan, 2018b; McCarthy, 2018).

The question of how to transition away from capitalism is even more befuddling today. The remaining ‘socialist’ states, despite some notable achievements – such as Cuba’s innovations in sustainable agriculture (Clausen et al., 2015) and Venezuela’s exciting yet contradictory experiments in reconciling direct democracy and state planning (Wilde, 2017)—, are marred by systemic problems, impeded by both external forces, as emphasized by sympathizers, and internal contradictions, as emphasized by critics. More importantly, as degrowthers have also pointed out (Liegey et al., 2020), the left in much of the world is small and unorganized leaving pathways uncertain for all movements working towards an emancipatory transition. Yet, continuing to challenge the hegemony of capitalist realism and growthism, and influencing policy changes that lead us in a direction towards a post-capitalist future remain worthy pursuits, even if the influence of movements continues to be disaggregated and ephemeral. This is the sociopolitical context of our call to imagine alternative social futures.

Although we cannot fully elaborate this argument here as we have elsewhere (see Authors), we think the best chance at commencing a transition out of capitalism is a combination of state-installed ‘non-reformist reforms’ and pressure from massive grassroots social movements to adopt these reforms. The five strategies outlined here (economic democracy, work-time reduction, energy democracy/energy cooperatives, advertising restrictions, and nationalizing and phasing out fossil fuel companies) represent key ‘non-reformist reforms’ that would help to initiate a just systemic transition. Based on the empirical evidence, these synergistic strategies supported by both ecosocialists and degrowthers stand out as having great potential to minimize global warming, yet the climate movement has not yet articulated and pursued these strategies.

In this paper, we illustrate how climate movement organizations like XR and FFF could greatly benefit from connecting with policies and programs from the ecosocialist and degrowth literature.

This connection is critical to push forward the most effective and just solution strategies. While there are stigmas and strategic issues associated with using the terms ecosocialism and degrowth, the five strategies outlined in this paper can be pursued and promoted without using these terms. What is of increasing importance is to share that other strategies, pathways, and systems are possible.

Notes on contributors

Diana Stuart, Ph.D. is an Associate Professor in the Sustainable Communities Program in the School of Earth Sciences and Environmental Sustainability at Northern Arizona University. Her research examines environmental and social issues in industrial agriculture and how to transition to a more sustainable food system. Her work has explored ways to increase wild biodiversity, reduce fertilizer pollution and greenhouse gas emissions, and support animal welfare.

Brian Petersen, Ph.D. is an Associate Professor in the Department of Geography, Planning and Recreation at Northern Arizona University. His research and published work focuses on climate change adaptation and landscape level conservation. His work draws on both social and natural science perspectives to interrogate contemporary natural resource and environmental challenges.

Ryan Gunderson, Ph.D. is an Assistant Professor of Sociology and Social Justice Studies in the Department of Sociology and Gerontology at Miami University. His current research projects concern the potential effectiveness of proposed solutions to environmental problems; the social dimensions and environmental impacts of technology; and the renewal of classical and mid-twentieth century sociological theory.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Diana Stuart  <http://orcid.org/0000-0003-1479-2208>

References

- Alperovitz, G., Guinan, J., & Hanna, T. (2017). *The policy weapon activists need*. The Nation.
- Anderson, K., & Bows, A. (2012). A new paradigm for climate change. *Nature Climate Change*, 2(9), 639–640. <https://doi.org/10.1038/nclimate1646>
- Andreucci, D., & Engel-Di Mauro, S. (2019). Capitalism, socialism and the challenge of degrowth: Introduction to the Symposium and the challenge of degrowth: Introduction to the symposium. *Capitalism Nature Socialism*, 30(2), 176–188. <https://doi.org/10.1080/10455752.2018.1546332>
- Archer, R. (1995). *Economic democracy: The politics of feasible socialism*. Clarendon Press.
- Aronoff, K. (2019). Spanish socialists running for re-election Sunday on a “Green New Deal de España.” *The Intercept*, April 27. <https://theintercept.com/2019/04/27/spain-elections-green-new-deal/>
- Barca, S. (2019). An alternative worth fighting for: Degrowth and the liberation of work. In A. Chertkovskaya, A. Paulsson, & S. Barca (Eds.), *Towards a political economy of degrowth* (pp. 175–192). Rowman & Littlefield.
- Bayon, D. (2015). Unions. In G. D’Alisa, F. Demaria, & G. Kallis (Eds.), *Degrowth: A vocabulary for a New Era* (pp. 189–191). Routledge.
- Boillat, S., Gerber, J. F., & Funes-Monzote, F. R. (2012). What economic democracy for degrowth? Some comments on the contribution of socialist models and Cuban agroecology. *Futures*, 44(6), 600–607. <https://doi.org/10.1016/j.futures.2012.03.021>
- Byrne, J., Martinez, C., & Ruggero, C. (2009). Relocating energy in the social commons. *Bulletin of Science, Technology & Society*, 29(2), 81–94. <https://doi.org/10.1177/0270467609332315>

- Chertkovskaya, E., Paulsson, A., & Barca, S. (2019). *Towards a political economy of degrowth*. Rowman & Littlefield.
- Clausen, R., Clark, B., & Longo, S. B. (2015). Metabolic rifts and restoration: Agricultural crises and the potential of Cuba's organic, socialist approach to food production. *World Review of Political Economy*, 6(1), 4–32. <https://doi.org/10.13169/worldreviewpoliecon.6.1.0004>
- Cosme, I., Santos, R., & O'Neill, D. W. (2017). Assessing the degrowth discourse: A review and analysis of academic degrowth policy proposals. *Journal of Cleaner Production*, 149, 321–334. <https://doi.org/10.1016/j.jclepro.2017.02.016>
- Debord, G. (1983). *Society of the spectacle*. Black and Red.
- Fisher, M. (2009). *Capitalist realism: Is there no alternative?* John Hunt Publishing.
- Fitzgerald, J. B., Jorgenson, A. K., & Clark, B. (2015). Energy consumption and working hours: A longitudinal study of developed and developing nations, 1990–2008. *Environmental Sociology*, 3(1), 213–223. <https://doi.org/10.1080/23251042.2015.1046584>
- Foster, J. B. 2011. "Capitalism and degrowth: An impossibility theorem." *Monthly Review*, 62(8), 26–33. https://doi.org/10.14452/MR-062-08-2011-01_2
- Foster, J. B. (2015). The great capitalist climacteric: Marxism and "system change Not climate change". *Monthly Review*, 67(6), 1–18. https://doi.org/10.14452/MR-067-06-2015-10_1
- Foster, J. B., & Clark, B. (2020). *The robbery of nature: Capitalism and the ecological rift*. New York: Monthly Review Press.
- Frase, P. 2011. "Four futures." *Jacobin*. <https://www.jacobinmag.com/2011/12/four-futures/>
- Gabriel, C. A., & Bond, C. (2019). Need, entitlement and desert: A distributive justice framework for consumption degrowth. *Ecological Economics*, 156, 327–336. <https://doi.org/10.1016/j.ecolecon.2018.10.006>
- Galbraith, K. (1958). *The affluent society*. Houghton Mifflin.
- Gowan, P. (2018a). "A Plan to Nationalize Fossil-Fuel Companies." *Jacobin*. <https://www.jacobinmag.com/2018/03/nationalize-fossil-fuel-companies-climate-change>
- Gowan, P. (2018b). The radical reformist. *Jacobin*. <https://jacobinmag.com/2018/03/rudolf-meidner-sweden-social-democracy-labor>
- Gunderson, R. (2019). Work time reduction and economic democracy as climate change mitigation strategies: Or Why the climate needs a renewed labor movement. *Journal of Environmental Studies and Sciences*, 9(1), 35–44. <https://doi.org/10.1007/s13412-018-0507-4>
- Gunderson, R., Stuart, D., Petersen, B., & Yun, S. J. (2018). Social conditions to better realize the environmental gains of alternative energy: Degrowth and collective ownership. *Futures*, 99, 36–44. <https://doi.org/10.1016/j.futures.2018.03.016>
- Haberl, H., Wiedenhofer, D., Virág, D., Kalt, G., Plank, B., Brockway, P., Fishman, T., Hausknost, D., Krausmann, F., Leon-Gruchalski, B., & Mayer, A. (2020). A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: Synthesizing the insights. *Environmental Research Letters*, 15(6), 065003. <https://iopscience.iop.org/article/10.1088/1748-9326/ab842a/meta>
- Heikkurinen, P., Lozano, J., & Tosi, P. (2019). Activities of degrowth and political change. *Journal of Cleaner Production*, 211, 555–565. <https://doi.org/10.1016/j.jclepro.2018.11.119>
- Hickel, J. (2019). Degrowth: A theory of radical abundance. *Real-World Economic Review*, 87, 54–68.
- Hickel, J. (2020). *Less is more: How degrowth will save the world*. Random House.
- Hickel, J., & Kallis, G. (2019). Is green growth possible? *New Political Economy*, 1–18. <https://doi.org/10.1080/13563467.2019.1598964>
- Horkheimer, M., & Adorno, T. W. (1969). *Dialectic of enlightenment*. Continuum.
- Hubacek, K., Chen, X., Feng, K., Wiedmann, T., & Shan, Y. (2021). Evidence of decoupling consumption-based CO2 emissions from economic growth. *Advances in Applied Energy*, 4, 100074. <https://doi.org/10.1016/j.adapen.2021.100074>
- IPCC. (2018). *Intergovernmental panel on climate change*. 2018. Summary for policymakers. In: *Global warming of 1.5°C*. World Meteorological Organization.
- Jarvis, H. (2019). Sharing, togetherness and intentional degrowth. *Progress in Human Geography*, 43(2), 256–275. <https://doi.org/10.1177/0309132517746519>
- Johanisova, N., & Wolf, S. (2012). Economic democracy: A path for the future? *Futures*, 44(6), 562–570. <https://doi.org/10.1016/j.futures.2012.03.017>

- Kallis, G. (2017). Radical dematerialization and degrowth. *Philosophical Transactions of the Royal Society a: Mathematical, Physical and Engineering Sciences*, 375(2095), 1–13. <https://doi.org/10.1098/rsta.2016.0383>
- Kallis, G. (2018). *Degrowth*. Agenda Publishing.
- Kallis, G. (2019). Socialism without growth. *Capitalism Nature Socialism*, 30(2), 189–220. <https://doi.org/10.1080/10455752.2017.1386695>
- Kallis, G., Demaria, F., & D'Alisa, G. (2015). Introduction: Degrowth. In G. D'Alisa, F. Demaria, & G. Kallis (Eds.), *Degrowth: A vocabulary for a New Era* (pp. 1–18). Routledge.
- Kellner, D. (2002). Theorizing globalization. *Sociological Theory*, 20(3), 285–305. <https://doi.org/10.1111/0735-2751.00165>
- Kenis, A., & Mathijs, E. (2014). Climate change and post-politics: Repoliticizing the present by imagining the future? *Geoforum; Journal of Physical, Human, and Regional Geosciences*, 52, 148–156. <https://doi.org/10.1016/j.geoforum.2014.01.009>
- Knight, K. W., Rosa, E. A., & Schor, J. B. (2013). Could working less reduce pressures on the environment? A Cross-National Panel Analysis of OECD Countries, 1970–2007. *Global Environmental Change* 23(4): 691–700. <https://doi.org/10.1016/j.gloenvcha.2013.02.017>
- Kovel, J. (2000). The struggle for use value: Thoughts about the transition. *Capitalism Nature Socialism*, 11(2), 3–23. <https://doi.org/10.1080/10455750009358910>
- Kunze, C., & Becker, S. (2015). Collective ownership in renewable energy and opportunities for sustainable degrowth. *Sustainability Science*, 10(3), 425–437. <https://doi.org/10.1007/s11625-015-0301-0>
- Latouche, S. (2015). Imaginary, decolonization of. In G. D'Alisa, F. Demaria, & G. Kallis (Eds.), *Degrowth*, 117–120.
- Liegey, V., Nelson, A., & Hickel, J. (2020). *Exploring degrowth: A critical guide* (p. 7). Pluto Press.
- Löwy, M. (2007). Eco-socialism and democratic planning. *Socialist Register*, 43, 294–309.
- Marcuse, H. (1964). *One-Dimensional Man*. Beacon.
- Martinez, C. (2017). From commodification to the commons: Charting the pathway for energy democracy. In Fairchild, D., & Weinrub, A. (Eds.), *Energy democracy: Advancing equity in clean energy solutions* (pp. 21–36). Washington D.C.: Island Press.
- Marx, K. (1981). *Capital*, Vol. 3. Vintage.
- McCarthy, M.A. (2018). Democratic socialism isn't social democracy. *Jacobin*. <https://jacobinmag.com/2018/08/democratic-socialism-social-democracy-nordic-countries>
- McKibben, B. (2019). *The climate movement: What's next?* The Great Transition Initiative. <https://greattransition.org/gti-forum/climate-movement-mckibben>
- Parrique, T., Barth, J., Briens, F., Kerschner, C., Kraus-Polk, A., Kuokkanen, A., & Spangenberg, J. H. (2019). Decoupling debunked: Evidence and arguments against green growth as a sole strategy for sustainability. *European Environmental Bureau*, 76.
- Paulson, S. (2017). Degrowth: Culture, power and change. *Journal of Political Ecology*, 24(1), 425–448. <https://doi.org/10.2458/v24i1.20882>
- Paulson, S., D'Alisa, G., Demaria, F., & Kallis, G. (2020). *The case for degrowth*. John Wiley & Sons.
- Petersen, B., Stuart, D., & Gunderson, R. (2020). Reconceptualizing climate change denial: How new forms of ideological denialism misdiagnose climate change and limit effective action. *Human Ecology Review*, 25(2), 117–142.
- Pullinger, M. (2014). Working time reduction policy in a sustainable economy: Criteria and options for its design. *Ecological Economics*, 103, 11–19. <https://doi.org/10.1016/j.ecolecon.2014.04.009>
- Rosnick, D. (2013). Reduced work hours as a means of slowing climate change. *Real-World Economics Review*, 63(25), 124–133.
- Rosnick D. & Weisbrot, M. (2006). *Are shorter working hours good for the environment? A comparison of U.S. And European energy consumption*. Center for Economic and Policy Research. Washington, D.C.
- Santarius, T. (2012). *Green growth unraveled: How rebound effects baffle sustainability targets when The economy keeps growing*. Berlin: Wuppertal Institute.
- Schor, J. (2015). Work-Sharing. In G. D'Alisa, F. Demaria, & G. Kallis (Eds.), *Degrowth: A vocabulary for a New Era* (pp. 181–191). Routledge.
- Schor, J. B., & Jorgenson, A. K. (2019). Is it too late for growth? *Review of Radical Political Economics*, 51(2), 320–329. <https://doi.org/10.1177/0486613419831109>

- Schweickart, D. (1992). Economic democracy - a worthy socialism that would really work. *Science & Society*, 56(1), 9–38.
- Smith, R. (2019). An ecosocialist path to limiting global temperature rise to 1.5°C. *Real-World Economics Review*, 87, 149–180.
- Spash, C. L. (2020). Apologists for growth: Passive revolutionaries in a passive revolution. *Globalizations*, 1–26. <https://doi.org/10.1080/14747731.2020.1824864>
- Speth, G. (2015). Getting to the next system: Guideposts on the way to a new political economy. *The Next System Project*, 43.
- Speth, J. G., Skandier, C. S., & Bozuwa, J. (2018). Taking climate action to the next level. *The Next System Project*, 31.
- Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., & Hällström, N. (2021). Three decades of climate mitigation: Why haven't we bent the global emissions curve? *Annual Review of Environment and Resources*, 46(1), 653–689. <https://doi.org/10.1146/annurev-environ-012220-011104>
- Stoner, A. M. (2020). Critical reflections on America's green New deal: Capital, Labor, and the Dynamics of Contemporary Social Change. *Capitalism Nature Socialism*, DOI: [10.1080/10455752.2020.1775860](https://doi.org/10.1080/10455752.2020.1775860)
- Stoner, A. M., & Melathopoulos, A. (2016). If climate 'changes everything', why does so much remain the same. *Logos*, 15, 1–13.
- Szulecki, K. (2018). Conceptualizing energy democracy. *Environmental Politics*, 27(1), 21–41. <https://doi.org/10.1080/09644016.2017.1387294>
- Vergara-Camus, L. (2019). Capitalism, democracy, and the degrowth horizon. *Capitalism Nature Socialism*, 30(2), 217–233. <https://doi.org/10.1080/10455752.2017.1344868>
- Wallerstein, I. (1979). *The capitalist world economy*. Cambridge University Press.
- White, D. F., Gareau, B. J., & Rudy, A. P. (2017). Ecosocialisms, past, present and future: From the metabolic rift to a reconstructive, dynamic and hybrid ecosocialism. *Capitalism Nature Socialism*, 28(2), 22–40. <https://doi.org/10.1080/10455752.2017.1296479>
- Wilde, M. (2017). Utopian disjunctures: Popular democracy and the communal state in urban Venezuela. *Critique of Anthropology*, 37(1), 47–66. <https://doi.org/10.1177/0308275X16671787>
- Wolff, R. (2012). *Democracy at work: A cure for capitalism*. Haymarket Books.
- York, R. (2010). Three lessons from trends in CO₂ emissions and energy Use in the United States. *Society & Natural Resources*, 23(12), 1244–1252. <https://doi.org/10.1080/08941920903421133>
- York, R. (2012). Do alternative energy sources displace fossil fuels? *Nature Climate Change*, 2(6), 441–443. <https://doi.org/10.1038/nclimate1451>
- York, R., & Bell, S. E. (2019). Energy transitions or additions? *Why a Transition from Fossil Fuels Requires More Than the Growth of Renewable Energy*. *Energy Research & Social Science*, 51, 40–43. <https://doi.org/10.1016/j.erss.2019.01.008>
- York, R., Ergas, C., Rosa, E. A., & Dietz, T. (2011). It's a material world: Trends in material extraction in China, India, Indonesia, and Japan. *Nature + Culture*, 6(2), 103–122. <https://doi.org/10.3167/nc.2011.060201>
- York, R., & McGee, J. A. (2016). Understanding the jevons paradox. *Environmental Sociology*, 2(1), 77–87. <https://doi.org/10.1080/23251042.2015.1106060>