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Climate Change and the Polanyian Counter-movement: Carbon Markets or Degrowth?

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ABSTRACT

In the midst of a wave of market expansion, carbon markets have been proposed as the best way to address global climate change. While some argue that carbon markets represent a modern example of a Polanyian counter-movement to the environmental crisis, we adopt a structural interpretation of Polanyi to refute this claim. Carbon markets represent a further expansion of markets that fails to address the underlying contradictions related to the commodification of nature. In addition, they increase risks to society and the domination of economic elites. While carbon markets further subject social and ecological relations to market mechanisms, we examine degrowth as a possible response to climate change that prioritises social and environmental goals over economic growth. While degrowth continues to be dismissed as impractical or impossible, a growing number of scholars, scientists and activists argue it is the only way to address global climate change. In contrast to carbon markets, we argue degrowth could represent a genuine Polanyian counter-movement in response to climate change. In addition, degrowth could help all those disenfranchised by market fundamentalism by addressing the triple crises related to the commodification of land, labour and money.

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To allow the market mechanism to be sole director of the fate of human beings and their natural environment indeed, even of the amount and use of purchasing power, would result in the demolition of society. (Polanyi 2001 [1944]: 76)

The climate movement made an enormous mistake. We focused all our attention on fossil fuels, when we should have been pointing to something much deeper: the basic logic of our economic operating system. (Hickel 2016: 2)

Introduction

The expansion of markets in the current neoliberal era represents one of several waves of market expansion in recent history (Burawoy 2015). Karl Polanyi's seminal book, *The Great Transformation*, reflects upon two previous waves of market expansion: the first beginning at the end of the eighteenth century and the second beginning after the First World War. In each case, counter-movements emerged to protect society from the negative impacts of commodification. Polanyi believed that the protectionist movement after the Second World War signified a new understanding of markets and a permanent end to their over-extension; however, we find ourselves in the midst of yet another wave of market expansion. While Polanyi warned about the destruction that a reliance on market

mechanisms could cause to society and nature, he likely never anticipated the magnitude of the current threat posed by global climate change.

The increasing commodification of nature has accelerated climate change. Increasing quantities and types of fossil fuels have been extracted, priced, sold in markets and subsequently burned. Fossil fuels, as natural conditions of production, represent an example of what Polanyi (2001 [1944]) calls a 'fictitious commodity'. Fossil fuels were not created for the purpose of being bought or sold in a market but existed for thousands of years below ground, part of the land or nature (this conceptualisation is expanded upon below). By incorporating fictitious commodities into market systems without protective measures, Polanyi argues we run the risk of destroying the social and natural dimensions of our world. In this paper, we draw from the work of Polanyi and scholars who have applied and extended his work to explore responses to climate change. Specifically, we critically examine carbon markets as a counter-movement to climate change.

In response to the threats of climate change, carbon markets have been created to reduce greenhouse gas emissions and protect society. Carton (2014: 1009) argues that market-based solutions represent a modern counter-movement to climate change and that 'carbon trading can be conceptualized as an example of Polanyian social protection'. In contrast, we draw from Fraser (2014) and adopt a structural interpretation of Polanyi, arguing that carbon markets do not represent a genuine counter-movement to climate change and that they will not be able to protect society: carbon markets increase commodification and further embed society in market relations, ignoring fundamental contradictions. We then explore degrowth as a counter-movement to climate change and as an approach that attempts to embed markets into the socio-natural sphere (Kaup 2015). Degrowth also represents a counter-movement to commodification in general and has the potential to address the multiple crises created by prioritising economic growth.

Polanyi and climate change

Three key theoretical concepts from Polanyi (2001 [1944]) apply to our analysis of climate change: fictitious commodities, the double movement and (dis)embeddedness. As a large body of literature has examined, interpreted and applied these three concepts (for clear explications and review of interpretations, see Dale 2010, 2016b and Holmes 2012), we review these concepts only briefly and focus our attention on how they apply to our analysis of responses to climate change.

According to Polanyi (2001 [1944]: 75), commodities are 'objects produced for sale on the market'. He argues that because they are not produced for sale, 'labor, land, and money are obviously not commodities' and therefore represent fictitious commodities (Polanyi 2001 [1944]: 75). When fictitious commodities are treated like real commodities negative consequences will ensue. Here we focus on climate change, an issue most closely related to what Polanyi discusses in terms of 'land': 'land is only another name for nature, which is not produced by man' (Polanyi 2001 [1944]: 75). Polanyi argues that without protections, 'nature would be reduced to its elements, neighbourhoods and landscapes defiled, rivers polluted, military safety jeopardised, the power to produce food and raw materials destroyed' (Polanyi 2001 [1944]: 76). Other social scientists have already recognised carbon emissions as a Polanyian fictitious commodity (Kaup 2015). It is not our intention to argue this point further. We focus on carbon markets as a furthering of this false commodification.

While Polanyi states that treating fictitious commodities as genuine commodities can result in the destruction of society, he also describes why this has not occurred: 'social history in the nineteenth century was thus the result of a double movement: the extension of the market organization in respect to genuine commodities was accompanied by its restriction in respect to the fictitious ones' (Polanyi 2001 [1944]: 79). Polanyi emphasises the importance of the double movement: 'human society would have been annihilated but for protective counter-moves which blunted the action of this self-destructive mechanism' (2001 [1944]: 79). Counter-movements emerged to protect nature and society from the consequences of the commodification of land, labour and money. Burawoy (2015) maps out three waves of market expansion and their counter-movements

including the third or neoliberal wave, which threatens ecological catastrophe. Here, we examine carbon markets as a counter-movement to climate change.

Lastly, Polanyi's notion of embeddedness is helpful for assessing the overall purpose of a counter-movement. While the concept of the embedded or disembedded economy has been greatly debated, we agree with other scholars that it is the idea rather than the reality of the disembedded economy that drives market fundamentalism (see discussion in Holmes 2012). In other words, market fundamentalism attempts to embed social and ecological processes into the logic of the free market:

the control of the economic system by the market is of overwhelming consequence to the whole organization of society: it means no less than the running of society as an adjunct to the market. Instead of economy being embedded in social relations, social relations are embedded in the economic system. (Polanyi 2001 [1944]: 60)

Although markets never become fully disembedded from society, the idea drives attempts that are increasingly destructive (Dale 2016b). Market fundamentalism attempts to expand commodification and subject society and nature to market rules. Counter-movements thus should attempt to re-embed economic systems within the socio-natural sphere (Kaup 2015), prioritising social and environmental protection.

Scholars have applied Polanyi to climate change arguing that (1) carbon-based fossil fuel is a fictitious commodity and (2) a double movement has emerged surrounding the consequences of its commodification (e.g. Carton 2014, Kaup 2015, Osborne 2015). Here, we examine if carbon markets represent a counter-movement to climate change. Carton (2014) adopts a flexible or 'soft' interpretation of Polanyi that recognises market-based strategies that increase commodification as counter-movements. Carton (2014: 1007) argues that carbon markets represent a modern form of the double movement:

it seems reasonable to conclude that in a society where social institutions have become embedded in economic relations – i.e. where norms, values, and interests have become tied in with a generalised market mechanism – those social and political forces constituting the countermovement might in part be consistent with the further expansion of market relations.

Thus, a market-based problem gets a market-based solution. Carton (2014: 1008) also adds, 'counter-movements need not be "good for everyone" to be valid examples of the dynamics that Polanyi described'. The author argues that the success of counter-movements now depends on their 'compatibility with capitalist social relations' and that carbon markets 'can be conceptualized as an example of Polanyian social protection' (Carton 2014: 1008–09).

We draw from Fraser's (2014) structural interpretation of Polanyi in order to challenge Carton's claim that carbon markets are a Polanyian counter-movement and develop a critique of, rather than an apology for, carbon markets. Fraser (2014: 548) argues that 'the structural reading of fictitious commodification foregrounds the inherently self-contradictory character of free-market capitalism'. Fraser (2014: 548) argues that Polanyi identifies 'three contradictions of capitalism: the ecological, the social, and the financial, each of which underpins a dimension of crises' (see also, O'Connor 1998). She states that attempts to commodify labour, land and money are contradictory and ultimately undermining, 'akin to a tiger that bites its own tail' (Fraser 2014: 548). Therefore, further commodification only deepens these contradictions and causes further damage to society and ecosystems. In addition, Fraser's (2014) extension of Polanyi includes recognition of domination and sensitivity to hierarchy and exclusion. She illustrates how some protectionist movements can be used to further, rather than mitigate, domination and inequality in society.

We argue that further attempts to commodify carbon emissions through carbon markets will fail to address climate change, further domination by elites, and ultimately increase risks to society. In contrast, a genuine counter-movement would address the underlying contradictions and would not further domination. In contrast to Carton (2014), we argue that only an approach that re-embeds the economy into the socio-natural sphere (Kaup 2015) will have any success in addressing climate change. This paper contributes to applications of Polanyi to climate change by adopting

Fraser's (2014) structural interpretation and exploring how degrowth may offer a more just and successful counter-movement compared to carbon markets. In the following sections, we describe carbon markets, examine carbon markets as a counter-movement to climate change and then explore degrowth as an alternative.

Carbon markets in theory and practice

Carbon markets are a commonly proposed mechanism to reduce emissions (Muûls *et al.* 2016). They usually involve a combination of cap-and-trade and carbon offsets schemes. The idea of cap-and-trade is to make fossil fuel sources economically scarce through imposed emission limits and giving away or auctioning off tradable legal rights or 'allowances' to emit. Carbon offset schemes refer to investments in climate mitigation infrastructural or business projects, often in developing countries, which allow the investors to gain carbon credits to emit more. The mitigation projects, which may just be minor 'green' updates to dirty factories, supposedly 'offset' future emissions, a process Klein (2014: 223) describes as 'running in place'. For example, the Kyoto Protocol's Clean Development Mechanism (CDM) allows industries in developed countries to invest in emission reduction projects (carbon offsets) in developing countries in order to buy carbon credits to increase emission caps.

Carbon markets have been implemented or are under consideration in a growing number of regions at multiple scales, including Australia, California, the European Union (EU), New Zealand, Quebec, Canada and South Korea (Lohmann 2005; Newell *et al.* 2013; Muûls *et al.* 2016). The centrality of carbon markets as a climate policy mechanism is clear in Article 6 of the Paris Climate Agreement of the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC 2015). Article 6 recognises that national governments may utilise 'internationally transferred mitigation outcomes', without explicitly using the terms 'emissions trading' or 'carbon market'. The somewhat difficult wording of Article 6 'provide[s] the ability to create an international market if any Parties [of the Agreement] so desire' as well as 'the means to create a process that may/will lead to the convergence of domestic carbon prices over time' (Marcu 2016: 6). Further, Article 6 establishes a carbon offsets scheme, widely referred to as the 'Sustainable Development Mechanism'.

Assumptions from environmental economics underlie carbon market schemes. Assigning prices to natural entities to solve environmental degradation presupposes that environmental degradation and problems result from 'unpriced' (non-commodified) resources being used/polluted without compensating the harmed human parties (van den Bergh 2000). These 'negative externalities' (uncompensated/unpriced harms) are not accounted for either in the market price of the product or in the product's production costs (Fairbrother 2016). According to environmental economics, the solution is to internalise these negative externalities. To do this, one must think of the environment as a pool of commodified and not-yet-commodified resources, or, 'natural capital', in order to assign price values to natural entities or classes of entities (e.g. Hawken *et al.* 1999; for a critical overview, see Foster *et al.* 2009). In the case of carbon markets, the prices created through bargaining are supposed to represent how much society 'values' the resource (Lohmann 2005, Newell *et al.* 2013).

Most research on the effectiveness of emissions trading has focused on the EU Emissions Trading System (ETS) (for reviews, see Newell *et al.* 2013, Muûls *et al.* 2016). The most positive reports estimate a 2.4–4.7 per cent reduction in total emissions from 2005 to 2007 and there have likely been slight decreases in emission intensity during Phase II (2008–2012) (for a sympathetic overview of positive findings, see Muûls *et al.* 2016: 5).¹ However, Carbon Trade Watch (2011) argues that the ETS failed to reduce total emissions, including during Phase I, and emissions reductions in the EU since the implementation of the ETS are primarily due to non-ETS variables, such as renewable energy production and the economic recession (Nicolas *et al.* 2014). Further, there is little evidence for resultant long-term investment in new technologies (Leiter *et al.* 2011). In addition, one could trade a permit to pollute a ton of carbon for cents in 2007 due to an oversupply of allowances following industry lobbying and the CDM market collapsed in 2012 (Newell *et al.* 2013).

Along with the lack of success of the EU ETS to reduce emissions, there are a number of controversies surrounding carbon markets, especially connected to the CDM (for review, see Klein 2014: 219). The most notorious case relates to Chinese and Indian coolant plants. By installing cheap technological means to destroy HFC-23, a highly potent greenhouse gas byproduct, the factories were able to gain and sell emission credits worth millions of dollars. This incentivised the plants, which were already producing an extremely environmentally harmful commodity, to produce more HFC-23 in order to destroy it to gain emissions credits to sell to polluters (CDM Watch and Environmental Investigation Agency 2010; Klein 2014: 219–20).

Carbon markets: a false counter-movement

The usual assumption that past limitations and inadequacies of market-based reforms are due to technical issues neglects the more fundamental question: The relationship of market-based solutions to social-structural conditions (Melathopoulos and Stoner 2015). The structural interpretation of Polanyi summarised above is a helpful framework for addressing this question in the case of carbon markets. As a fictitious commodity, the commodification of carbon-based fossil fuel sources creates profits – indeed, what profit-making does not at least indirectly depend on the burning of carbon-based fossil fuels? – yet carbon's 'non-commodification may, also, be necessary to capitalism's survival' (Castree 2010: 1739). Carbon-based fossil fuels exist 'within' and 'beyond' the production process and represent both 'opportunities' for and 'barriers' to capital (Castree 2009: 192).

Carbon is a condition of production in two senses: (1) as an energy source and (2) as part of the climate system. However, because carbon is a naturally occurring condition of production that is treated as if it were a real commodity (i.e. a fictitious commodity), a paradox develops, which Gunderson *et al.* (2017: 6) term the 'capital-climate contradiction': the 'contradiction between capital's need to expand production, on the one hand, and the destructive effects expansionistic production has on the conditions of production, specifically the climate system, on the other' (see also, Wies 2010: 318–19). The capital-climate contradiction is a colossal 'second contradiction of capitalism', whereby 'individual capitals defend or restore profits by strategies that degrade or fail to maintain over time the material conditions of their own production' (O'Connor 1998: 162). Commodified carbon-based fossil fuel sources are brought into an economic system that must constantly expand production (Schnaiberg 1980), increasing the use of carbon-based fossil fuels and the addition of CO₂ to the atmosphere (Antonio and Clark 2015: 352–7). It is carbon's dual status as both a condition of production and a commodity that underlies capitalism's 'creative self-destruction' (Wright and Nyberg 2015).

Carbon markets are best interpreted as an attempt to address climate change through expanding the commodification of carbon while ignoring the fundamental issues related to the capital-climate contradiction. The endeavour is paradoxical and unlikely to succeed for a number of interrelated reasons, including (1) the perpetuation of the structural causes of climate change; (2) attempts to control carbon through markets may result in obstacles, surprises and risks; and (3) the implicit and explicit undermining of alternative social futures and policies that have the potential to reduce carbon emissions. Carbon markets also (4) represent a response to climate change that benefits economic elites and furthers their domination of society. These four points are discussed in detail below.

Carbon markets perpetuate the structural causes of climate change by recommending the expansion of carbon commodification rather than its reduction. Along with carbon-based fossil fuel being a part of what Polanyi called the fictitious commodity 'land' or 'nature', carbon credits represent a fictitious commodity as well, 'because their very existence as something that can be bought and sold depends on making them both visible and tradable' (Kaup 2015: 291). As described by Kaup (2015), carbon markets are constructed by (1) deciding how much carbon can be released, (2) making invisible gases into measurable credits, and (3) creating a market where they can be traded (bought and

sold). Carbon markets represent an attempt to address climate change that furthers capitalist expansion, attempting to convert nature into capital (Knox-Hayes 2010). However, because carbon is a fictitious commodity and carbon markets do nothing to address the underlying contradictions between nature and capitalism, carbon markets are bound to cause increasing problems and deepen existing contradictions. Foster *et al.* (2009) analogise carbon market schemes to the Greek myth of King Midas, to whom Dionysus granted his wish for everything he touched to be turned to gold, later to find that he could not eat or drink. In this analogy, the God of the practitioners is their pre-existing conditions, a socio-economic system that persists through profit-maximisation via commodification and the expansion of production, and the unintended consequence is as follows: 'putting price tags on species and ecosystems will only serve in the end to subsume nature to the endless growth of production and profits' (Foster *et al.* 2009: 1090). In the same way that 'the modern businessman sees in the landscape an opportunity for the display of cigarette posters' (Horkheimer 1947: 104), carbon-based industries see the climate system as an accumulation strategy (Smith 2007). In short, climate markets rely on the historically contingent and problematic attempt to reduce the value of fossil fuels to a 'sum of private values' (van den Bergh 2000: 7) without recognising the degrading outcome of expanding the use of a condition of production.

Because they fail to address the capital-climate contradiction (Gunderson *et al.* 2017), carbon markets will continue to undermine society and the environment. Attempts to commodify carbon are flawed and possibly dangerous. Drawing from Marx's conception of formal and real subsumption, Boyd *et al.* (2001) convincingly argue that the more capitalism attempts to incorporate and control aspects of nature, the more obstacles and surprises will emerge. Attempted commodification of nature and transforming nature into sites of production can result in unexpected and catastrophic outcomes: 'efforts to further control and subordinate biological systems to the dictates of industrial production will almost inevitably generate new risks and vulnerabilities for the production process, not to mention unforeseen externalities' (Boyd *et al.* 2001: 561). While the impacts and many of the risks of fossil fuel combustion are already clear, further commodification through carbon markets will likely increase risks. Already, attempts to quantify and control carbon face obstacles and surprises. For example, Osborne (2015) examines carbon storage in forests and finds that unforeseen biophysical processes, such as pest infestations, can significantly reduce carbon storage and invalidate expected offsets. In addition, models of global carbon sources, sinks and movement are plagued with unknowns. In general, carbon and climatic systems are still not fully understood with uncertainties remaining in terms of nonlinear relationships, feedbacks and thresholds that can undermine the ability to set a 'safe' limit in a cap and trade programme (Lohmann 2010). Inserting carbon into a market mechanism assumes humans can control carbon and ignores critical unknowns, leaving open a range of potential obstacles and surprises. Falsely assumed control over the carbon cycle will only increase risks to society.

Carbon markets also increase risks to society by preventing or delaying alternatives with the potential for transformative reductions in greenhouse gas emission. Carbon markets demote or undermine alternative policies and alternative social futures that would be more effective. Lohmann (2005) provides evidence for this happening in the context of the Kyoto Protocol. After the U.S. introduced the idea of emissions trading, this redirected intellectual and financial resources from innovations and social changes that had the potential of reducing emissions. Environmental criticisms of Kyoto's emphasis on establishing a carbon market were scorned as taking a 'do-nothing' stance, input and ideas from nonprofessional and noncorporate groups were minimised, and alternative pathways were marginalised. The corporate watchdog non-profit Corporate Europe Observatory (2015) argues that the existence of the EU ETS has undermined the ability of new emissions regulations to take hold and its negligible targets act as a 'ceiling' rather than a 'floor' for national climate policies. In short, another ideological function of emissions trading is the reproduction of the capital-climate contradiction through the implicit disavowal of alternative social futures. By accepting capitalism as a given, market-based solutions demote alternative social futures that may be able to more successfully address climate change.

The creation of carbon markets as a response to climate change represents a defensive manoeuvre from economic elites to preserve the status quo and further the accumulation of capital to the wealthy few (Klein 2014). It is a political strategy influenced by substantial financial interests (Bryant 2016). The further commodification of carbon creates profits. These profits are going to the same people already profiting from the current neoliberal system. Lohmann (2010) details how carbon markets are dominated by the same institutions active in derivatives trading, including Goldman Sachs and other big banks. Carbon markets are dominated by speculators and supported by the largest actors in finance as well as industry, who prefer a more flexible and capitalist mechanism to address greenhouse gas emissions (Kaup 2015). Large banks and corporations are already reaping profits from trading carbon. If carbon markets represent a counter-movement to climate change, it is a movement that will further domination in society, hierarchy and inequality. This reality spurs Carton (2014: 1008) to specifically explain, ‘countermovements need not be “good for everyone”’. In contrast, Fraser’s (2014) interpretation and extension of Polanyi incorporates domination, power and hierarchy and calls for counter-movements that restore justice as well as social protection.

Lastly, we draw upon Polanyi’s concept of embeddedness to examine carbon markets as a counter-movement to climate change. Carbon markets further embed society and nature into market relations; whereas a genuine counter-movement would work to embed markets into the socio-natural sphere. Kaup (2015) suggests a neo-Polanyian approach to socio-natural embeddedness. Polanyi never stated that nature and society are separate and Kaup argues that embeddedness can relate to a combined social and natural sphere. Rather than attempting to re-embed markets into social relations, to address climate change we must re-embed markets into the socio-natural sphere. As detailed above, through attempting to subject nature to a market mechanism, carbon markets further commodification, domination and risks to society. A genuine counter-movement would involve prioritising social and environmental goals over market expansion and would protect society and ecosystems from harm in a way that is just and equitable (Fraser 2014). As stated by van Griethuysen (2010: 3), to avoid social-ecological collapse, we must ‘shift from the property-based hierarchy where social and ecological considerations are subordinated to the capitalist economic rationality towards an eco-social rationale, where economic activities are subordinated to social and ecological imperatives’.

Degrowth: a genuine counter-movement?

In a world where markets are presented as the solution to all problems, an ideological challenge to the supremacy of the market is a crucial preliminary to any effective countermovement. (Burawoy 2015: 24)

The degrowth movement challenges the logic of market fundamentalism and the addiction to economic growth that has resulted in climate change. The term ‘degrowth’ emerged in France in the 1970s and activist groups in the country used it prominently beginning in 2001 (Baykan 2007). It later developed into an ‘activist-led science’ (Martinez-Alier *et al.* 2011) and multidisciplinary ‘academic paradigm’ (Weiss and Cattaneo, 2017). Demaria *et al.* (2013: 193) argue that ‘degrowth has now become a confluence point where streams of critical ideas and political action converge’. The elementary claims are as follows: economic growth cannot go on forever due to ecological limits and, thus, wealthy societies should intentionally contract their economies in a socially sustainable way (Latouche 2010; Martinez-Alier *et al.* 2010; Research & Degrowth ; Schneider *et al.* 2010; Kallis 2011; Assadourian 2012; Kallis *et al.* 2012; Weiss and Cattaneo 2017).

Degrowing the economy in a socially sustainable way means a voluntary and ‘equitable downscaling of production and consumption that increases human well-being and enhances ecological conditions at the local and global level, in the short and long term’ (Schneider *et al.* 2010). More simply, degrowth means a ‘socially sustainable and equitable reduction of society’s throughput’ (Videira *et al.* 2014: 59). Despite concerns about scarcity, degrowth, as Kallis and March (2015) suggest, starts from

the premise ‘that we do not need to “develop” to get enough, because we already have, and in a sense always had, enough. What we need is to struggle for the institutions that will allow us to live with enough.’ Therefore, degrowth is about living with enough rather than supporting a consumer culture that demands an increasing amount of material goods. Pathways and mechanisms to economic degrowth have been proposed and explored (e.g. Buch-Hansen 2014; Videira *et al.* 2014; D’Alisa *et al.* 2015: Part 3; for summary, see Weiss and Cattaneo 2017: 225–6, 228). Likely the most influential proposal is the call for shorter working hours (Knight *et al.* 2013; Fitzgerald *et al.* 2015; Weiss and Cattaneo 2017). Here, we focus on the potential of degrowth-related principles and proposed policies to address climate change.

Degrowth has emerged as a political response to address a multi-dimensional crisis that involves social, financial and environmental threats (Kallis *et al.* 2012). The root cause of these threats is unsustainable economic growth. How does economic growth relate to climate change? As put by Hickel (2016: 2), ‘we’re only using fossil fuels in the first place to fuel the broader imperative of GDP growth. The root problem is the fact that our economic system demands ever-increasing levels of extraction, production and consumption.’ To address this root problem, degrowth involves the contraction of growth and a reduction in the extraction and use of energy and materials, including fossil fuels. Data already show that reduced growth associated with recessions has decreased greenhouse gas emissions (Stern 2006). Degrowth represents a planned reduction in growth and material throughput and would therefore reduce greenhouse gas emissions.

Scholars and scientists argue that degrowth is necessary to adequately respond to climate change and that economic contraction is inevitable due to natural limits (Jackson 2009, Kallis *et al.* 2012). In his famous review, Stern (2006) states that decarbonisation of more than 3–4 per cent is impossible in a system with economic growth. Two climate scientists studying carbon budgets, Anderson and Bows (2011), recognise that the reductions necessary are incompatible with continued economic growth and make a strong case for degrowth based on their findings. Alexander (2014) argues that the scientific evidence supports degrowth: to stay within the carbon budget wealthy countries must cut carbon emissions by 8–10 per cent over the next few decades, a task that will require not only supply-side changes in technology but also demand-side reduction in consumption and an energy descent that is incompatible with continued economic growth. Based on undeniable biophysical limitations, it is not a matter of if the economy will contract, but when (Jackson 2009). Degrowth represents a planned contraction and transition into a new economic system that is compatible with decarbonisation.

Policy changes proposed by degrowth scholars and activists include carbon taxes that would make greenhouse gas emissions increasingly expensive, abolishing fossil fuel subsidies, divesting from the fossil fuel industry, rapidly switching to renewable energy and adopting lifestyle changes that increase efficiency and reduce consumption (Alexander 2014). In addition, a mandatory reduction in work hours could reduce throughput and therefore greenhouse gas emissions (King and van den Bergh 2017). These strategies closely resemble protections adopted by the state to protect society from commodification, as described by Polanyi (2001 [1944]). As with protective measures for labour and land, the state can implement policies that protect people and ecosystems from climate change through specific policies that restrict greenhouse gas emissions. However, protective measures for climate change demand a new scale of governance. For the waves of marketisation that Polanyi examined, social protections for labour and finance were instituted by individual nations. Burawoy (2015: 24) argues that national-level reforms to address our current crises are not enough and that any successful counter-movement ‘will have to assume a global character, couched in terms of human rights since the survival of the human species is at stake’. Degrowth scholars have already proposed global responses. For example, Douthwaite (2012) proposes the formation of a Global Climate Trust where fossil fuel use is controlled through a ‘cap and share’ system. The idea involves a declining annual cap on carbon emission from fossil fuels and allocating emissions on an equal per capital basis globally.

While these policy proposals would surely reduce carbon emissions much more rapidly than current mechanisms, carbon-based fossil fuel and emissions would remain commodities in the market. Polanyi did not condemn all markets – he condemned them when social-natural relations became dominated by market relations. Constraining the ‘free-market’ through increased regulation that protects society from climate change clearly represents a Polanyian counter-movement. However, Polanyi also discusses at length how societies can function without markets and the importance of reciprocity in early societies. Adopting Fraser’s (2014) structural interpretation of Polanyi, we see that contradictions still exist when carbon-based fossil fuel and emissions remain commodities – even with the adoption of protective measures. Is it possible to decommodify carbon-based fossil fuel? What would a society without commodified energy sources look like? Could degrowth lead to such a society?

It is difficult to predict whether Polanyi himself would support a degrowth programme.² On the one hand, Polanyi, like degrowth thinkers, was critical of the destructive impacts a disembedded market system has on the environment and human beings, as made clear in his *opus* (2001 [1944]). Similar to Kallis and March (2015), Polanyi theorised scarcity as, in part, a socially constructed notion: ‘insofar as the scarcity postulate springs “from the demand side”, it is attributable “to a mis-conceived notion of the good life as a desire for a greater abundance of physical goods and enjoyments”’ (Polanyi quoted in Dale 2012: 873–4). Further, he was critical of any line of thinking that casts machine production into a ‘dogma’, one ‘that regards the unlimited expansion of material welfare as a natural law’ (Polanyi 2016 [1922]: 153). On the other hand, Polanyi believed in the liberal notion of progress, though not naively (see Dale 2016a: 10), supported growth-oriented regimes (e.g. Stalinist Russia) (see Dale 2016b), and, to our knowledge, never developed a critique of economic growth and increased throughput. Regardless of whether Polanyi himself would support degrowth, we argue that degrowth represents a genuine Polanyian counter-movement as its principles and pathways could guide the re-embedding of energy systems in the socio-natural sphere.

Based on degrowth principles of living with enough, reciprocity and sharing, new community-based energy systems could exist without carbon commodification. Key principles to guide community-based energy systems are already being discussed. Energy can be seen as a common good that is collectively owned and managed (Byrne *et al.* 2009). Specific social and environmental goals, rather than economic goals or even energy production goals, could guide energy systems (Kunze and Becker 2015). Governance would be participatory – run by the community (Byrne *et al.* 2009, Kunze and Becker 2015). Lastly, lifestyle changes would include reduced energy consumption and the adoption of a range of even simple and low-tech changes including increasing walking and biking, using passive solar design for heating and cooling, insulating housing, dressing appropriately to reduce heater use, using clotheslines rather than dryers and shifting toward non-electronic-based entertainment (Alexander and Yacoumis 2016). Kunze and Becker (2015) have already identified over 100 community-based energy projects across the EU that display many of these degrowth principles. While carbon exists as a commodity, communal ownership and sharing of energy systems paves the way for possible decommodification of carbon in the future. Rather than managing carbon as a commodity through prices, in these alternative systems specific limits can dictate community use of energy and greenhouse gas emissions. Participatory democratic processes would also protect against inequality and injustice in the community. Assessments of participatory and deliberative environmental decision-making are generally positive (for systematic reviews, see Beierle and Cayford 2002; United States National Research Council 2008).

Based on Polanyi’s description of protective counter-movements, we find that the adoption of degrowth-related policies could represent an example of a genuine counter-movement to climate change. However, degrowth policies and practices not only represent a counter-movement to the commodification of nature but also to the commodification of labour and money. Degrowth has the potential to be the ‘triple movement’ as called for by Fraser (2014). While O’Connor (1998) suggests that movements to address the dual crises of labour and environment should unite, Fraser (2014) argues that those harmed by financial speculation should join to create a triple

movement. Degrowth unites all those disenfranchised by economic growth (Kallis *et al.* 2012). Unlike carbon markets, degrowth-related policies and principles attempt to re-embed markets into the socio-natural sphere. In addition, community-based and communally owned energy systems could pave the way toward the decommodification of carbon and more fully address the capital-climate contradiction (Gunderson *et al.* 2017).

Despite this potential, degrowth faces criticisms and challenges. van den Bergh (2011) critiques the degrowth movement for having imprecise definitions of what degrowth means and entails and for being too radical to be relevant. Schwartzman (2012: 119) states, 'the degrowth program is highly problematic because of its failure to analyze the qualitative aspects of economic growth and its emphasis on the local economy without recognizing the urgency to address global anthropogenic change from a transnational perspective'. This echoes Burawoy's (2015) call for a global approach to our current climate crises, but specifically argues that degrowth is not addressing the challenge at a large enough scale. Foster (2011) criticises degrowth scholars for skirting the question of capitalism and argues that degrowth faces significant challenges confronting the current economic system.

Despite these and other critiques, the degrowth movement has continued to grow and solidify. Findings from international degrowth conferences show that attendants agree that degrowth represents an anti-capitalist perspective that critiques domination and calls for a transition to a better society (Eversberg 2016). As mentioned above, the collective ownership and control of energy systems could act as a central pathway to establish a degrowth society as these social conditions may allow for the better use of alternative energy converters, a point we argue in detail elsewhere (Gunderson *et al.* 2017). Commons that are collectively owned, combining participative community governance with some level of centralised planning (i.e. state control), should be a central proposal of degrowth. Treating energy systems as commons with fitting property laws and governance structures would allow for a re-embedding of energy use into the socio-natural sphere, thereby increasing the possibility for more substantively rational decision-making about energy (e.g. decarbonisation, equitable and limited alternative energy use for meeting needs). With above critiques of degrowth in mind, we emphasise collective ownership as degrowth goals require collective, anti-capitalist measures (as opposed to individual-lifestyle reforms or establishing small 'alternative' communities). Our analysis in this paper addresses some of these concerns at a theoretical level by connecting Fraser's structural interpretation of Polanyi and Burawoy's Polanyian Marxism to the degrowth literature.

Conclusion

The work of Karl Polanyi has taken on increasing relevance in recent years. As Fraser (2014: 544) argues, today's crises are part of a 'great transformation redux' – the current neoliberal era has unleashed the same crises described by Polanyi. Crises linked to market expansion have not only been recognised by academics but also by activists, politicians and public figures (e.g. Horn 2013, Asara *et al.* 2015, Burawoy 2015, Francis 2015). Market expansion continues to contribute to greenhouse gas emissions and global climate change. Here, we draw from Polanyi to examine how efforts to address climate change may or may not constitute a counter-movement that can successfully address the root causes of our current environmental crises. We apply a structuralist interpretation of Polanyi (Fraser 2014) to argue that carbon markets do not represent a genuine Polanyian counter-movement. They further expand the market mechanism, increase domination and inequality, and will be unable to successfully address climate change in a way that protects the majority of global citizens from harm.

Carbon markets will not succeed because they fail to address the underlying contradictions related to the commodification of nature and further subject society and ecosystems to markets. In contrast, through reducing economic growth and policies to constrain the market and reduce greenhouse gases, degrowth could represent a genuine counter-movement to climate change.

Degrowth principles prioritise social and environmental goals, subjecting the market to those goals. In addition, degrowth could represent a triple movement to address all those harmed by the commodification of land, labour and money. Part of the neoliberal agenda has been to eliminate the notion that any alternative is possible (Morgan 2013). While degrowth may continue to be dismissed by the majority as impractical or impossible, an increasing number of scholars, scientists and activists argue that degrowth is the only way to successfully address climate change.

Notes

1. It should be noted that reducing the environmental intensity of social and economic processes is not a sound measure for reducing total environmental pressure, and may even lead to increases in environmental pressure (e.g. York *et al.* 2009).
2. We would like to thank an anonymous reviewer for insights here.

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