Social Structure of Accumulation Transition 
and the Gathering Climate Storm

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ABSTRACT: SSA theory has not explicitly incorporated a role for interconnections between nature and the socioeconomic regime. The present study investigates that role with respect to a particular instance, the interplay between the crises of climate change and neoliberalism.
1. Introduction

It is widely recognized that climate change, driven by anthropogenic greenhouse gases, poses a severe threat to society and its institutions, in the US and worldwide. At the same time, progressive researchers generally agree that the structures of US capitalism, organized around the principles and practices of neoliberalism, are facing a crisis as well. What is the relationship between these two crises? What can be said about the impact of climate pressures on the decay of the current social structure of accumulation (SSA) and their likely effect on the processes of exploration that will lead to construction of the next? Answering this question requires attention to the channels by which such pressures are and will be affecting profitability, systemic stability and coherence, and the institutional arrangements underlying both.

This is related to, but not the same as, the question of whether climate change can be stabilized at non-catastrophic levels within capitalism. If climate pressures are severe enough and capitalism inflexible enough to endanger the viability of the system itself, then it is logical that before fundamental collapse is threatened those pressures will tend to shape institutional change within the system. On the other hand, even if capitalism is capable of mitigating climate change, the extent to which climate pressures will influence the trajectory of capitalist evolution remains an open question.

There is, unavoidably, a great deal of indeterminacy to be confronted in exploring these issues. If governing elites in the major capitalist states take the kinds of steps that will be required to rein in climate change before catastrophic results are inevitable – likely under intense grass-roots pressure – then it is much more likely that climate pressures, transmitted through those steps, will strongly affect exploratory change at the corporate and institutional levels. This is independent of whether it is ultimately possible to tame climate change within capitalism. But continued weak response by national and international governing bodies might allow the processes of inter- and intra-class struggle involved in SSA transition to proceed without climate playing a central role.

To begin, section 2 briefly reviews SSA theory, with an extension that has been proposed for integrating ecological considerations into the study of structural change in capitalism. A set of potential avenues by which such considerations with respect to climate might affect SSA transition is considered in section 3. Section 4 looks more closely at some of the SSA implications of the labor-process and spatial transformations that would be required to stabilize climate change. In a concluding discussion, section 5 looks at the class interests involved in different climate-response paths, as those interests pertain to the processes of SSA breakdown and re-formation.

2. SSA and nature

The construct “social structure of accumulation” was originated by Gordon, Edwards and Reich (Gordon et al. 1982). It grew out of concern with the societal determinants of sustained periods of capitalist economic growth versus stagnation and crisis (Aglietta 1976; Gordon 1978, 1980; Edwards 1979). SSA theory in the United States focuses on the institutional frameworks that mark historical stages of capital accumulation. The argument is that capital accumulation, as a “microeconomic activity of profit making and
reinvestment” (Gordon et al. 1982, 25), occurs within a broad network of economic, political, and other institutions that directly affect surplus value: the SSA. These institutions include labor market structures, financial markets and practices, legal and regulatory systems, and others. In addition, while each firm’s labor process is not a part of the social structure, each SSA is thought to be characterized by a “customary…organization of the labor process” (Gordon et al. 1982, 25). This customary organization comprises broadly shared ways of organizing work, skill, and technology such that there is a strong fit with the corresponding institutional structure and its dynamics (Goldstein 2016).

The SSA framework is a theory of historical change in capitalism. A constellation of institutions that works well to support profitability and accumulation in one set of circumstances may not as those change. The very logic of a successful SSA may generate dynamics that become increasingly destabilizing the longer and more vigorously its institutions and class interrelationships play out: Homogenizing workers around assembly line-driven mass production is profitable at first but begins to foster class-conscious labor militancy; depressing wages, expanding indebtedness, and loosening regulation allows profits and capital’s income share to rise, but a tradeoff between depressed demand and macro-stability becomes increasingly sharp.

The theory refers to this as the “decay” phase of an SSA. As the institutional structure moves from promoting to obstructing profitability, economic performance worsens; inter- and intra-class tensions rise, along with pressures for political change; and capitalists begin to experiment with new labor-process and market approaches. From these tendencies arise the “exploration” phase toward a new institutional framework and customary labor process. Historically, SSA transitions have varied greatly in sequencing and duration. Both early SSA researchers (Gordon et al. 1982) and later ones (for example, Kotz 2015) have argued that there may be long intervals during which one set of arrangements decays while exploration toward a new set proceeds. But a renewed period of strong profitability and satisfactory growth cannot take hold until institutions and practices capable of resolving the prior structure’s contradictions are in place.

While this has not figured prominently in SSA research, each customary labor process and related institutional structure will be linked in myriad ways with the ecological setting. The characteristic technologies of production, transportation, and the built environment all embody specific uses of and impacts on ecosystem goods and services (Daily 1997). These uses and impacts are mediated by the scientific, legal/regulatory, and worldview elements that are associated with the institutional setting. SSA theory has not explicitly incorporated a role for such interconnections between nature and the socioeconomic regime. The present study investigates that role with respect to a particular instance, the interplay between the crises of climate change and neoliberalism.

Although others have explored this dynamic (for example, Peet et al. 2011, Malm 2013), here the focus will be the argument made by Moore (2015). Although he does not specifically address SSA theory, Moore proposes that as capitalism evolves, ecological crisis is always central to systemic economic crises and subsequent transformations. Systemic transitions in capitalist development are always linked to breakdowns in old ways and “discovery” of new ways of appropriating nature. Indeed, “nature” and “society” are not separable in his framework: “Capitalism is not an economic system; it is not a social
system; it is a way of organizing nature.... a world-ecology, joining the accumulation of capital, the pursuit of power, and the co-production of nature in dialectical unity” (22, 25). Thus, Moore rejects the dualism of “nature vs society” or “economy vs environment.” In his view, capitalism’s unifying dynamic is “a ‘law of value’ that is a ‘law’ of Cheap Nature. At the core of this law is the ongoing, radically expansive, and relentlessly innovative quest to turn the work/energy of the biosphere into capital” (47). Every stage of capitalism is based on finding new sources of and ways to appropriate “Cheap Natures”: “a rising stream of low-cost food, labor-power, energy, and raw materials” (126-127). When the costs of these “natures” rise due to pressures associated with their deepening appropriation, profitability is threatened and crisis ensues.

Investigating the compatibility of this argument with the historical account of US social structures of accumulation is beyond the scope of the present study. Certainly, new sources of agricultural land, labor-power, energy, and raw materials have played important roles in the rise of each of the four SSAs bracketing the 20th Century in the US. And often, these sources have at least at first been appropriated – in ways both brutal and mundane – at far below social cost. The purpose here is to open up SSA theory by incorporating Moore’s basic point as it applies to climate change. Noting that “appropriation—of cheap resources, yes ("taps"), but also of cheap garbage ("sinks")… produce[s] the relations, spaces, and work/energy that make value possible” (79), Moore says that “capitalism’s wastes are now overflowing the sinks, and spilling over onto the ledgers of capital. Climate change... is our most expressive instance of this phenomenon” (622).

Moore argues that climate change should be understood as an historical “vector of planetary change woven into the very fabric of civilizational power and production” (101). Climatic conditions in his framework are central to and co-created by the rise and demise of successive societal forms. Climate change may constitute limits on the development of capitalist social structures; but those limits are not external to society, rather arising from the evolution of particular, historical interpenetrations of biosphere, accumulation, and appropriations of “the four Cheaps.” The next step here is to examine whether and how the progression of climate change in tandem with that of the present SSA is indeed creating costs that capital can no longer avoid, and what part those constraints may play in shaping a crisis of the current SSA and transition toward a new one.

3. Climate change as a constraint on the (re-)organization of US capitalism

What are the potential channels through which climate change might affect these processes? The current SSA is most frequently titled “neoliberalism,” a convention that is followed in this paper. (See for example Rosenberg 1991; Kotz 2008; Kotz and McDonough 2010). The neoliberal institutional framework includes substantial market deregulation; political, regulatory, and corporate hostility to unions and worker protections; weakened public-good and safety-net provisions; expansive financial markets with attendant, periodic booms and busts; and increased, liberalized trade and investment under the aegis of a heavily US-influenced multilateral global-policy regime. Addressing these global activities and relationships, others (Wallace and Brady 2001, 2010) have focused on a labor process characterized by centralized control of spatially decentralized activity. Along with advances
in information technologies, faster and more efficient transportation is seen as enabling outsourcing and subcontracting, capital flight, downsizing, de-unionization, and concessionary and two-tier labor contracts. Recent work by Goldstein (2016), drawing on Lazonick (1994, 2001), has drawn attention to ways the SSA has co-opted elements of flexible, high-performance production within a strongly Taylorist, management-controlled, job insecurity-enforced customary labor process. All of these features will be potentially of interest in thinking about ways that climate pressures might contribute to SSA decay and explorations toward a new regime.

Figure 1 begins this examination by mapping the routes through which climate change might affect SSA-relevant actors, institutions, and dynamics. The starting point is the link between fossil fuels and climate change. There are other contributors, but fossil fuels account for roughly 90% of US greenhouse gas emissions (US Environmental Protection Agency 2016); and there are non-climate impacts of fossil fuels (Boyce and Pastor 2012), but those will not be considered here. Lighter arrows indicate second-order effects.

**Figure 1 Climate change-SSA channels**

There are two major, interrelated channels. Directly, the greenhouse effect leads to rising sea levels, intensified storms, droughts, heat waves, wide-ranging species effects, and many other damages and risks. These impacts may act to destabilize the functioning of the institutional structure within which accumulation occurs by imposing costs, exposing institutional inadequacies, and reducing support from important class actors. Indirectly, the system is affected by the “extreme energy extraction” increasingly necessitated by the declining availability of easily-accessed fossil-fuel resources (Ackerman 2010, Extreme Energy Extraction Collaborative 2014). Critics of the “peak oil” argument have pointed to the effect of scarcity in encouraging discovery of new resources and the means required to exploit them. But using ever more complex technologies to extract less and less accessible
fossil fuels involves growing risk, cost, and energy input for a given extracted-energy output. Methods like deep-water drilling, fracking, tar-sands mining, and mountaintop removal create new sources of supply, but expose society and the climate to rising levels of damage and risk.

It will be useful to take a closer look at each of these major channels as they relate to the neoliberal SSA. Direct climate impacts impose a rising burden on public resources and capabilities at all levels. Storms, inland and coastal flooding, water shortages and droughts, and extreme heat events create immediate needs for costly cleanup, relief, and infrastructure and response systems. With the increasing frequency and severity of these kinds of impacts, pressure also grows (albeit in contested ways, as noted below) for legislative and regulatory actions to improve institutional efficacy in mitigating and adapting to climate impacts beyond emergency response.

But neoliberalism is a fundamentally deregulatory, privatizing social structure-cum-ideology. The clash between this basic thrust and the need for wide-ranging public involvement via regulatory, legislative, and investment interventions goes a long way toward explaining conservative US resistance to climate action: It is seen as a Trojan Horse for smuggling “big government” back into the realm (Taylor 2015). Nevertheless, climate impacts will continue to worsen and impose rising costs, and the growing urgency of these unmet needs is likely increasingly to destabilize the viability of and heighten conflict over current institutional arrangements.

SSA theory is unapologetically capital-centric. It is based on the idea that while there are disparate influences on the institutional viability of a social structure, if the net effect on profitability and accumulation is not favorable, then both business-level and political responses by capital will further undermine that structure’s workings and militate toward specific kinds of change. There are certainly costs imposed directly on businesses by climate impacts. Such burdens include not only obvious ones like those on agriculture in drought-impacted regions and on real estate where there is flooding, but also insurance and interest rates for companies seen as especially vulnerable to climate-impact risks. (There are also business opportunities in responding proactively to climate change – for example, in lower-carbon energy and transportation technologies and systems – which will be addressed in sections 4 and 5.) But the response of corporate and financial capital to the climate dynamics described in the preceding paragraph has been mixed and shifting. Since the late 1990s, there has been a thread of high-level support for creating a clear and credible climate-policy framework that can begin to address the problem and permit corporate decision-makers to set long-term investment priorities with less uncertainty. As lately as the waning years of the George W. Bush administration, it seemed to be widely accepted that this path was inevitable and imminent (Kerschner and Geraghty 2007).

Since the conservative upsurge of the (anti-)Obama era, that is no longer the case. Although of course there is a great deal of variation, capital in general seems willing to let climate’s tomorrow take care of itself, acquiescing in rising aggregate climate costs and focusing instead on narrow industry and company-level advantage at each turn within a patchwork of climate-related public initiatives. There is no sign of the kind of capitalist drumbeat for action that characterized the late 1970s decay period of the post-War SSA (see for example Hayes and Abernathy 1980). On the other hand, a widening range of social movements has
responded to those rising costs through climate organizing within particular political contexts within and beyond traditional environmentalism per se. But there is no sense that these efforts are rising to a point at which they can, collectively, exert a powerful influence on the national political discourse or the direction of US institutional change: A recent news-opinion account (Leonhardt 2016) noted that during the 2016 Presidential debates – a period when “cities in at least 34 states reported record-high temperatures,” in a “year all but guaranteed to be the planet’s hottest on record” – there were no questions posed to any candidate about their climate-change views and plans.

What about the impact of the indirect effects of climate via extreme energy extraction? Its growing importance opens up a way of understanding Moore’s point that climate and capital are always mutually affecting, but that this interaction is tightening (2015, 622). Similarly, Lloyd-Davies sees the relationship between intensifying technologies and climate as both old and new, an historical process that moves with capitalist development: “There are plenty of examples of the process of extreme energy at work over the whole history of oil drilling and coal mining…. but due to the huge amounts of energy used by the present system it is proceeding at a much faster rate. The higher the rate of energy consumption, the faster that resources are depleted and the more rapidly the process of energy extraction becomes more extreme” (Lloyd-Davies 2013).

Social-movement struggles against extreme energy extraction have also proliferated in recent years. They have influenced executive decisions on major projects like the Keystone Pipeline and affected evolving legislative and regulatory frameworks for industries like unconventional oil and gas. A thorough exploration of these effects is beyond the scope of this study. Instead, it will be taken as provisionally evident that such effects have been mostly at the margins of national energy and climate practice, policy, and debate. On the other hand, the major spillover costs from extreme-extraction processes and their potential for accidental disasters like Deepwater Horizon certainly create liabilities for the firms involved, which can saddle them with both ongoing and episodic costs. But as long as the institutional structure permits much of this cost to be socialized (Ackerman 2010), the effect on capital seems mostly to be contained at acceptable levels.

There is another route by which extreme energy extraction might exert pressure on profitability, accumulation, and their enabling institutional structure. Many argue that as fossil-fuel extraction becomes more extreme, its net energy return falls, and that this imposes a growing drag on overall economic performance and, perhaps, an upward pressure on energy prices. One frequently-used indicator of this effect is the “energy return on investment,” or EROI: energy produced per unit of energy expended in the process. It is widely agreed that as fossil-fuel resources have become harder to access, EROI has fallen (Inman 2013). EROI is by construction closely related to the “net energy ratio,” which shows the net energy produced (after subtracting that which is expended) as a fraction of gross energy production. As EROI drops below a value around eight, a “cliff” is reached at which net available energy falls precipitously toward zero (Lloyd-Davies 2013). There has been little serious research on the claim that falling EROI and net energy force energy extraction to absorb a growing share of societal resources, thus slowing growth. Certainly fossil fuel-extraction companies continue to make lots of money and are able to sustain broader acceptance of an institutional regime geared toward socializing their costs and

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subsidizing their operations. And within that setting, the prices of fossil fuels have displayed volatility but not sustained, game-changing increases. Market prices reflect the influences of expanding sources of unconventional supply, rising external costs, and falling EROI – in addition to other important demand and supply side determinants (Kallis and Sager 2016).

The relationship between the growing contradictions of the fossil-fuels economy and the lack of responsive institutional change can be summed up as follows: In the absence of a dramatic regulatory and legislative shift, the impacts of climate change on business are not sufficiently concentrated to trigger a sense of crisis and the need for such a shift. Until climate impacts become deeper and broader, significant sectors of capital are unlikely to coalesce around a program of institutional response. At the same time, both the climate impacts and a patchwork of public initiatives continue to proliferate. State-level programs, the EPA’s Clean Power Plan, the European Union’s 2020 climate and energy package, the Paris accord now coming into effect, international airline and shipping climate agreements... neither singly nor together are these nearly sufficient, but they are adding up. There is a kind of double finger-in-the-dike story unfolding: Public-sector actors, responding to social pressures, try weakly to hold back the climate-change tides; and capital overall tries to prevent those interventions from becoming a flood.

Many have argued that forward-looking companies can profit by recognizing the inevitability of worsening climate conditions forcing basic institutional and market transformations (Hoffman 2006). This is a special instance of the case made by Robèrt that deepening environmental impacts constitute a “funnel” through which firms and governments must pass if they are to survive, and that early action to avoid the funnel’s walls increases the likelihood of survival (Holmberg and Robèrt 2000). The funnel is seen as a natural constraint, and thus the “business case” for climate action at the organizational level is said to be independent of particular regulatory measures. Indeed, some companies are already experimenting with products, processes, and stakeholder relationships aimed at strategic reorientation based on the premise that thorough-going, societal moves toward climate-change mitigation and adaptation are inevitable. But they are exceptions, and their actions are often cosmetic. The concluding section will consider the apparent narrowness and slowness of capitalist response more fully. First, section 4 will examine one kind of explanation: the inertia of deeply-ingrained, climate-relevant ways in which firms have learned to organize their labor-process and spatial configurations within the structures of the neoliberal SSA.

4. Capability, climate, and SSA transition

The direct and indirect impacts of climate change, and public responses aimed at mitigation and adaptation, have the potential to affect the ways firms organize their labor processes and configure themselves spatially. In turn, these organizational effects will powerfully channel the ways in which firms either address or try to circumvent climate pressures. The labor-process and spatial dimensions are interrelated, but for convenience this section looks at each in turn.
4.1. Labor-process dynamics of climate response

The customary labor process involves ways of configuring work, skill, and technology. The genealogy of these elements in neoliberalism runs straight through the evolution and hegemony of the fossil-fuel economy. Fossil fuels power, and transport supplies and products for, virtually every firm in every industry. The fossil-fuels input-output web extends from coal and oil and gas extraction and production themselves, to directly derivative products like asphalt and lubricants, to industries with major feedstocks that are fossil fuel-based: transportation, chemicals, plastics, agriculture and more. In addition, the capital goods for these and all other industries are directly or indirectly designed around fossil fuels-driven technologies.

Not surprisingly, fossil-fuels production and usage accounts for a sizable portion of US greenhouse gas emissions, and the labor processes of every firm in this core-technology web would be challenged by any significant shift toward mitigative institutions and policies. Carbon and other greenhouse gases are also generated by other products and processes in a range of major sectoral activities, all of whose labor processes would be similarly affected. These include agriculture and other land use-affecting industries; manufacturing of cement and other basic industrial products; and waste disposal. Figure 2 provides an illustration of the ubiquity of greenhouse gas-involving activity at all levels in the US economy.

Figure 2 shows greenhouse gases as they are generated by broad economic sector and then, more finely, by end-use as linked to those originating sectors. It gives a sense of the extraordinary range of technologies that are involved. This range can be thought of as the hardware of climate-forcing activities in the US economy. Skills and work organization are the software. For every related product, process, and fixed technology, there is know-how, standard operating procedure, and organization. With fossil fuel-based inputs, upstream purchasing and supplier relationships are involved. When outputs embody significant greenhouse gas-generating characteristics, downstream distributor and end-purchaser acceptance would be at issue in any major mitigative shift. Depending on the case, these dynamics are certainly of widely varying centrality to each firm’s competitive viability. But in the aggregate, their operation is a sharp illustration of Moore’s argument (2015) that climate and economy are by the very nature of things closely interpenetrating categories.
Firms depend on profit-making strategies that are somehow tied to a set of interrelated core technologies as they have evolved in the context of current and recent SSAs. A myriad of institutional arrangements within the neoliberal SSA is consonant with and supportive of fossil-fuel energy, internal-combustion transport, and industrial agriculture – and all the other intrinsically high-carbon technologies and practices discussed above. Such arrangements range from the US highway system to legal and conventional standards of landlord versus tenant responsibility for heating bills and equipment. To the extent that social-movement pressures force changes in this array of institutions, that pressure will be transmitted throughout the economy as firms must modify their labor processes to protect profitability and even survival.

Robért’s funnel argument (2000) is that the early movers will do better. But among several counter-dynamics, a key impediment is the force of organizational inertia that is created by firms sticking to what they know and do well. This is often studied under the heading “organizational capability,” “the capacity to mobilize and deploy resources at the firm level in competitively useful ways” (Helfat and Peteraf 2003, 999). Capabilities evolve over time.
in a context of fundamental uncertainty. Trial and error and repetition in relation to the competitive environment build organizational routines (Nelson and Winter 1982), many tacit, whose functioning create capability and allow firms to be profitable and survive. Organizational capabilities are thus path-dependent and, to a certain extent, idiosyncratic – although some researchers have correctly stressed the many threads that connect firm capability with broader societal structures (Lazonick 1994). Capabilities become well-worn channels within which skill, technology, and work are successfully ordered and deployed. But a channel can become a rut, making adaptation difficult when changes in the external environment threaten old ways of doing things.

Capitalist response to climate change is a case in point. Most companies resist both firm-level and institutional climate response because such changes threaten the organizational capabilities on which they compete. A few do begin to explore, based on the evolution of their firm-specific capabilities in technology, external search, and/or brand positioning. But the neoliberal SSA’s customary labor process applies a powerful brake to most firms’ willingness and ability to do likewise. Key elements of that labor process are what Lazonick (2001) has called “hierarchical and functional segmentation.” This is a different usage than Gordon et al. (1982) proposed for “segmentation”: In the US social structure, firms are vertically segmented by means of a rigidly Taylorist hierarchy that separates conception and execution between management and workers, respectively. An additional layer within that hierarchy is horizontal segmentation among functional areas like R&D, product design, manufacturing, and sales. These characteristic labor-process features serve to maintain capitalist and managerial control, but are often deadening with respect to organizational learning and adaptation to shifting external circumstances. The neoliberal SSA’s customary labor process consolidates the grip of fossil fuel-based and greenhouse gas-generating organizational capabilities throughout the US economy.

The labor-process transformations required for firms to significantly loosen that grip will entail labor-force re-skilling and redeployment, adoption of known but narrowly diffused technologies, and re-negotiation of market relationships both up- and downstream. Such changes will have to be encouraged and supported by corresponding ones in regulatory, educational, market, and other institutions. These dynamics create a chicken-and-egg problem: most capitalists will not make risky, climate-related changes absent considerable institutional pressure; but the requisite institutional incentives are difficult to create in the presence of active and passive resistance by capital. A good illustration is a McKinsey study (Farrell and Remes 2008) on the energy-efficiency dollars left on the table worldwide, which estimates that in the US, $38 billion in annual capital investments at an average internal rate of return of 17% could provide a proportionate contribution to “halv[ing] the projected growth in global energy demand…. [and] deliver[ing] up to half of the emission abatement required to cap the long-term concentration of atmospheric greenhouse gases at 450 parts per million…. Nevertheless, real obstacles stand in the way of these investments and the energy savings they could generate. One is a set of market and policy imperfections” (1).

The SSA framework suggests that these are not “imperfections,” but rather systematic institutional arrangements that have been conducive to profitability and accumulation during the neoliberal era in the US – but now stand in the way of an institutional re-
formation capable of containing the climate crisis. Along with these arrangements, and linked to the labor-process constraints on climate response, is a set rooted in the neoliberal SSA’s spatial dimension. This is explored in the next section.

4.2. Spatial dynamics of climate response

Climate mitigation and adaptation have an intrinsically place-based aspect (Goldstein 2015). The necessary institutional, market, and technological shifts must be societal in scope. But how and where these shifts are deployed will often depend upon both climatic conditions and resource bases at smaller scales. Sub-national regions have distinctive industry assets, labor forces, and potential for lower-carbon transportation and energy development. Both public and private investment in climate-stabilizing changes will need to be tailored to these regional climate and resource peculiarities. This kind of investment would also be stabilizing for regional economies, workers, and communities. But it will cut directly against the grain of the neoliberal SSA’s unfettered globalization of capital and a dense existing web of international company, industry, and market connections and practices.

The organizational capabilities of successful small and large firms alike include capacities for buying, selling, and/or producing across national borders. Such internationalization capabilities are the organizational concomitants of the neoliberal SSA’s open-border policy and production regimes. Since the acceleration from the 1970s onward of long-standing moves by US companies to relocate stages in their production systems, a great deal of learning via experimentation has been undertaken. In addition to honing confrontational labor-management strategies based on the threat and realities of relocation, firms also worked to find effective approaches to global supply chain management (Richardson 1995, Lee and Oakes 1996), strike the right balance between outsourcing and developing capabilities in-house (Kotabe 1989, Kogut and Zander 1996), and integrate geographically dispersed functions like manufacturing, marketing, and R&D (Kim et al. 2003). The institutional setting in which climate mitigation and adaptation unfolds sees even many small companies deploying capabilities around globally integrative accumulation processes. Capitalists’ responses are often more keyed in to profit opportunities within such well-established global channels than to regionally place-related needs and opportunities.

The implication of the foregoing is that capitalist climate strategies, to the extent they exist, have not depended on place-based investment and will tend to continue that way. What is globally integrative for capital is, by virtue of the shaping pressures of the neoliberal SSA, typically dis-integrative at the regional level where significant climate response could be based. An example is the rapidly growing global market for renewable energy technologies, in particular solar photovoltaic and wind turbines (Liu and Goldstein 2013). World demand for these technologies reflects the patchwork of climate and energy policies in Europe, the US, and elsewhere. Chinese producers, fueled by cheap coal, have dominated solar cell markets globally. In contrast, competitiveness in wind turbines requires intensive, experience-based capabilities, which has advantaged early movers from Europe and the US. General Electric has long been one of the top turbine producers internationally and does some of this production in the US, but appears to have steadily reduced its turbines’ domestic content. When GE sells wind equipment in the US it faces no domestic-content
requirements, unlike its operations in, for example, Canada (Business Wire 2012) or Brazil (Whitlock 2016). GE, which does R&D on four continents, has moved to exploit global renewable-technologies demand and simultaneously to avoid investing domestically in place-based, integrated renewables supply chains, production, and installation.

Each region’s particular configuration of firms and industries – including their global linkages – shapes and reflects a set of class power relations that channels and constrains adaptive responses generally (Coe et al. 2004): “(L)ocal actors in specific regions (e.g. labour and the state) and non-local actors in global production networks (e.g. TNCs and financial capital) are differentiated by their degree of territorial embeddedness which, in turn, will have very significant implications for regional development…. shap(ing) how value and power are distributed...” (471). This dynamic will hold true for the climate-change case in particular, conditioning how the SSA elements of globalized production, Taylorist labor process, and neoliberal politics interact to shape climate responses. Thorough-going, basic system-transforming, territorially-embedded mitigation and adaptation are severely constrained. What corporate strategies do exist are atomistic, exploiting market opportunities opened up by climate policies globally while the same firms act to slow and weaken such policies domestically.

5. Climate change and SSA transition

One of the conclusions from the foregoing is that the institutional and ideological dynamics entrenched in the neoliberal SSA militate strongly against significant responses to the inexorable growth of climate impacts. These dynamics make themselves felt in the political, corporate organizational, and labor arenas. Together, they create an interlocking set of rigidities with respect to significant climate-mitigative and adaptive response within this SSA. In a sense, this is to be expected from the point of view of SSA theory. The growth of crisis tendencies that cannot be ameliorated within the constraints of an existing regime is seen as a key motor pushing toward SSA decay and exploration. The theorized linchpin is the impact that such crisis tendencies have on profitability and accumulation. And that may be where, at least in the short run, this conceptual motor comes out of gear in the case at hand.

The costs of climate change in the US thus far are either minor and diffuse or substantial but highly focused in particular locales and/or industries. None of these costs reach broadly and directly into corporate labor processes and income statements. This insulation exists partly because the neoliberal SSA provides buffers that limit the profitability effect of climate impacts. The political and regulatory regime prevents carbon pricing and similar mechanisms while permitting the socialization of climate risk, in terms of both direct climatic impacts and the indirect ones of extreme energy extraction. These buffers hold at bay the forces tending toward rapid declines in the low-cost appropriability of the energy component in Moore’s “four Cheaps” (2015).

In addition to helping explain how the neoliberal SSA is still able to limit the costs of climate change to capital, the analysis developed here provides some insights regarding why even those corporate initiatives that do appear have been tightly contained in the context of the current institutional structure. Three possibilities suggest themselves; they
are not independent of one another, but each has its own logic. First, there is a “rational bubble” kind of phenomenon (Diba and Grossman 1988): Like the “smart money” in financial bubbles, even capitalists who understand the inevitability of climate-stabilizing action can profit by betting against it because of the market impact of “the herd” who do not buck the institutional orthodoxy. This is a function of the chicken-and-egg problem noted above. There is also the power of ideology. US capitalists have benefited mightily from the tenets and structures of neoliberalism; just as most have resisted calls for change even in the face of increasingly dramatic evidence of its macroeconomic instability, most also simply will not countenance institutional changes for climate stabilization. This is the Trojan Horse problem discussed earlier. Finally, there is the set of dynamics examined in section 4: the inertia of deeply-ingrained, climate-relevant ways in which firms have learned to organize their technological, labor-process, and spatial configurations within the structures of the neoliberal SSA.

All of the above can help explain the lack of broader and deeper mitigative responses by capital. But this could change, with a pace and timing depending on both uncontrollable events and the efficacy of social movements. It may be that the impacts of both crises facing neoliberalism – its macrostability contradictions and climate change – will increasingly intermingle and compound one another. The pivot on which this would turn would be social and political pressure at many levels. If neoliberalism’s deregulatory and wage-dampening commitments come under increasing attack due to financial instability and insufficient demand, the door could also be opened to demands for enhanced climate-related regulation and labor-force redeployment. Conversely, as the human and economic costs of climate-driven natural disasters accumulate and worsen, neoliberalism’s deregulatory, public-disinvestment, and low-wage dogmas could be further delegitimized.

This kind of intertwined dynamic could provide a channel through which SSA exploration and transition would move toward climate-stabilizing institutional changes involving some combination of carbon regulation, clean-technologies infrastructure development, workforce investment in reskilling and redeployment, and more localized re-spatialization. Elements of this kind of integrative transformation have been proposed by activist-researchers (for example, Pollin et al. 2008, Pollin and Boyce 2014). Their implementation is imaginable in the context of SSA breakdown and reconstruction; this is contested terrain and will depend on protracted struggles within and across major class formations.

Regarding the theoretical struggle to understand these phenomena, Moore’s challenge (2015) asks that economy and nature, SSA and climate crises, be conceptualized as a totality rather than a dualism. Appreciating this interconnectedness suggests that both the contradictions of neoliberalism and the potential pathways toward a reconstructed SSA be analyzed at every step in light of how capitalism at each historical stage depends on new appropriations of the Four Cheaps: energy, food, labor power, and raw materials. As crisis and SSA decay intensify and exploration proceeds, will new frontiers of appropriation be opened?

Neo-liberal capitalism is nearing exhaustion of the cheap energy appropriated in oil and gas – not simply because they are more scarce, but because their appropriation has both necessitated extreme extraction and clogged the atmospheric sink. If renewable energy becomes a core technology within a new institutional setting, will it be as a new Cheap,
with appropriation taking the form of reliance on corn ethanol, whole-tree biomass, solar cells produced using cheap coal, and wind turbines filled with offshored components? The SSA’s appropriation of cheap labor power is also reaching limits: Chinese workers are winning higher pay, living-wage and Fight for Fifteen campaigns have changed the US conversation on wages and effected a growing list of concrete gains, and more US workers are opting to sit it out by leaving skilled job-openings unfilled and/or exiting the labor force entirely (Goldstein 2016). When reconstruction takes shape, will Cheap labor power be reconstituted via expanded contract and contingent work institutions?

The point, of course, is not merely to analyze the changing world, but to understand it using tools that make it possible better to act upon these changes. The ultimate goal of such interventions is to end the oppressive irrationality of capitalism entirely. It was noted in the introduction that this paper’s analysis is related to but distinct from the question of the ability of capitalism in any form to coexist with climate stabilization sans societal catastrophe. Many have argued that capitalism is intrinsically incompatible with the steps required for this: that the necessary decreases in systemic energy and carbon intensities are inconsistent with growth rates that can sustain capitalism (for example, Li 2008). This paper’s analysis suggests that, in addition to static growth and intensity ratios, the class and institutional dynamics are critically important as well. Existing technical options for deep reductions in carbon emissions far exceed the neoliberal SSA’s firm- and policy-level flexibility for adopting those options. The ways in which the ailing institutional regime of neoliberalism acts to block deep, climate-stabilizing transformations in energy, transportation, agriculture, and the built environment are the immediate constraints that bind.

Whether progressive interventions will make it possible for climate change to insert itself into the course of SSA crisis and transition is impossible to say. A tipping point during the years of neoliberalism’s decline and a new SSA’s construction is by no means assured but is not unthinkable. Of course, even that would be far from guaranteeing sufficient change. Capitalism may not, indeed, be capable of saving itself from climate disaster. Our demands upon the system now must serve also to point to the long-run alternative.

Postscript: This paper was completed on election day, November 8. With Donald Trump’s victory, the likely short-term answers to some of the questions posed here are more clear. As in the UK’s Brexit vote, the accumulating crises of neoliberalism have engendered a white working-class upheaval that will powerfully shape the spooling out of those crises. A Trump administration and Republican-controlled Congress will double down on neoliberalism’s core commitments. The likelihood of significant climate-response exploration as part of SSA transition has decreased, while the locus of its potential remains, more than ever, in the streets with the social movements.
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