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4 The crisis of petro-market civilization: the past as prologue?

Tim Di Muzio

Summary

Current patterns of high-energy intensive development are not sustainable on account of two major challenges that threaten the social reproduction of this civilization: peak oil and global warming. This chapter seeks to probe the dimensions of this looming crisis at the heart of 'petro-market civilization' by foregrounding the links between energy and social reproduction. In doing so, the chapter makes two interrelated arguments. First, I argue not only that the age of fossil fuels is an exceptional one but also that the discovery and use of fossil fuels have been crucial to the deepening and extension of an incipient market civilization. Second, although there is recognition in both mainstream and more marginal circles that a broad-based global social transformation is needed in order to mitigate the probable consequences of global warming and peak oil, effective policy frameworks are not being put in place to deal with the looming crisis on the scale that would be necessary to transition to a post-fossil-fuel economy. The primary reason why this is so, I argue, is because solutions are informed by a neoliberal governmentality that prioritizes economic growth, international market mechanisms and individual responsibility.

Introduction

The collapse of global capitalization and the subsequent bankruptcy and loss of legitimacy of the financial institutions at the centre of the global political economy called for serious reflection on the failure of public and private leadership, the liberalization of financial markets and the need for more stringent regulation of global finance. Although it is well understood by some that financial crises are nothing new to an economic system based on commodity exchange and the accumulation of capital, the overarching policy debate of the moment appears to be focused on two rather short-term questions or concerns (Marx 1978 [1867];

Kindelberger 2005). First, there is the question of how best to avoid or contain future crises through some form of greater public oversight and regulation. Then, second, there is the question of how best to stimulate consumer spending and global economic growth. The problem with this narrow focus on the economic and financial crisis is that it misses the far broader and impending crisis of social reproduction at the heart of a fossil-fuel-dependent global market civilization – a crisis of social reproduction that continues to deepen and spread.¹ The looming crisis on the horizon – which is likely to be a far more devastating one – derives from the fact that the current patterns of high-energy intensive development can no longer continue, as a result of two major challenges that threaten the social reproduction of this civilizational order: peak oil and global warming. Whereas the financial system was bailed out by the public purse of many governments, it is unlikely that a similar bailout will be able to rescue global society from the consequences of fossil-fuel-dependent growth. Rather, both challenges require long-term planning, coordination and investment, not simply a timely injection of funds.

This chapter seeks to probe the dimensions of this looming crisis by foregrounding the links between energy and social reproduction. Rather than view the history of the global political economy as divided into successive hegemonies with distinct regimes of liberal governance, as some scholars do, when we consider the linkages between energy and the reproduction of civilizations it is perhaps more appropriate to conceptualize the history of the global political economy as divided into three eras: the pre-fossil-fuel age, the age of fossil fuels and the post-carbon age (Arrighi 1994; Cox 1987). With this in mind, I make two inter-related arguments. First, I argue not just that the age of fossil fuels is an exceptional one but also that the discovery and use of fossil fuels was crucial to the deepening and extension of an incipient market civilization that, at least by the fifteenth century, had started to emerge only in small pockets of the world (Abu-Lughod 1991; Braudel 1982). The emergence and social reproduction of a global market civilization has largely been undergirded by affordable, accessible and abundant fossil fuels. Not only is this situation about to go into reverse in this century, but continuing to use fossil fuels as the primary energy source of global growth only compounds the consequences that global climate change will have on the world's communities. What this means is that the

¹ It also sidesteps the debate as to whether the rapid escalation of oil prices in 2007 and 2008 could have precipitated what has been called the 'Great Recession'. On this question, see Hamilton (2009).

looming crisis will be a general crisis of social reproduction on a civilizational, rather than economic or financial, scale.

Second, I want to suggest that, although there is recognition in mainstream and more marginal circles alike that a broad-based global social transformation is needed in order to mitigate the likely consequences of global warming and peak oil, effective policy frameworks are not being put in place to deal with the impending crisis on the scale that will be necessary to make the transition to a post-fossil-fuel economy. In other words, the crisis of our petro-market civilization is also a governmental or leadership crisis. While we may be witnessing the rise of what some have called 'green governmentality' or the multi-scalar attempt to take ecological and environmental data into account when making decisions that will affect future generations, the far more entrenched form of leadership is issued from the register of neoliberal governmentality (Castree 2008; Heynen and Robbins 2005; McCarthy and Prudham 2004). In fact, there is considerable evidence to suggest that, in many aspects of policy, neoliberal governmentality has colonized the emergent attempt to govern within the limits of nature by encouraging 'green capitalism' (Hawken, Lovins and Lovins 2008; Wallis 2009). Since neoliberal governmentality prioritizes economic growth, international market mechanisms and individual responsibility as solutions for ecological problems, I argue that this form of leadership will do little to facilitate the transition to a post-carbon world in the timeframe needed to avoid serious repercussions for fossil-fuel-dependent societies.

In order to flesh out these arguments, I have organized this chapter into four sections. In the first I offer a brief genealogy of what I call a petro-market civilization and how the social reproduction of this civilizational order differs from earlier forms of social reproduction during the era before the widespread use of fossil fuels as a primary energy source. In section two I move to explore some of the consequences that this broad-based social transformation has for future generations and their social reproduction. In the third section I provide an outline of the neoliberal governmentality that currently informs political approaches to alternative energy issues. In the final section I conclude with a few remarks on how the past may be prologue to a much larger crisis if proposed solutions and policies continue to be informed by neoliberal governmentality.

A brief genealogy of petro-market civilization

The capture, conversion, storage and use of energy underpin all historical forms of social reproduction (Smil 1994; UNDP 2000). Recent literature employing the concept of social reproduction is varied but, at

a general level, it seeks to draw attention to the conditions, contradictions and transformations in material and/or biological life (Bakker 2007; Bakker and Gill 2003). By 'social reproduction' in this chapter, I mean the ways in which any society produces, consumes and reproduces its life and lifestyles, how it conceptualizes and understands these actions and how it defends and/or justifies its particular pattern of historical development. With this definition in mind, I offer a concise genealogy of what I call a petro-market civilization by focusing on how the social reproduction of this civilizational order differs from earlier forms of social reproduction before the age of fossil fuels.

Although the forms of social reproduction and organization in the era before the widespread use of carbon energy differed, they all had three things in common: (1) they were characterized by low-energy-intensive patterns of development relative to our current era; (2) they did not rely on market provisioning for survival, nor did market values permeate everyday life; and (3) they were pervaded by hierarchies of power and privilege in which the exploitation of surplus was direct and extra-economic (Wood 2002). The primary sources of energy during this pre-fossil-fuel age were phytomass (e.g. plants and wood), certain domesticated animals (e.g. oxen), human slavery and some minor uses of wind and water power. Moreover, land was the primary source of wealth, and, although there were merchants engaged in long-distance trade, this trade was primarily confined to the larger coastal cities of an emerging world economy. The world's population was also very low in comparison to the age of fossil fuels, so that even by 1750, when coal was becoming an important source of energy in Britain, the population of the planet was only some 750 million, compared with today's 6.7 billion.² Most of this population lived, worked and died in rural environments. In these conditions, most communities remained at a subsistence level of social reproduction. In other words, social reproduction was localized, consisting of social units and kinship networks relying on various overlapping tactics and strategies of self-provisioning such as hunting, gathering and – later – agricultural cultivation and husbandry for survival.

What all this amounts to is that, although there were various forms of social reproduction before the widespread use of carbon energy, transnational market forces did not mediate or arbitrate the everyday lives and lifestyles of the majority of the world's population. The transition to the current global social order in which the allocation of goods, services and

life chances are mediated and arbitrated by transnational market forces and mechanisms occurred first in Britain, but over the centuries it spread to encompass more of the world's population. The origins of this social transformation can be traced to what Marx called 'primitive accumulation', or the series of violent and fraudulent tactics used to expropriate direct producers from their customary access to the means of subsistence (see Marx 1976 [1867], in particular section 8). Dislocated from the land, former producers were transformed into vagabonds, criminals and wage-workers as ownership over the means of subsistence and work became increasingly privatized and sanctified in law (Hay, Thompson and Linebaugh 1975; Perelman 2000).³ These processes accelerated after the English Glorious Revolution of 1688, when private social forces subordinated the Crown to parliament.

Although there is no global history of primitive accumulation, by the middle of the nineteenth century Marx was able to observe that most of the peasantry in western Europe had been expropriated, resulting in capitalist private property and the norm of accumulation as a primary logic of production and exchange (Marx 1976 [1867]: 931). The only part of the globe where this process was not complete, argued Marx, was in the colonies of the European powers and some parts of the world not under European colonial occupation. However, since Marx's writing these expropriations have occurred with increasing frequency in the periphery of the global political economy, with large swathes of former direct producers or customary holders of land being forced into cities. One glaring indication of this is the rapid rise of urban slums similar in kind to those found in parts of Europe during the transition to capitalism (UN-Habitat 2003).

In these enclosures and expropriations we can also start to identify a new pattern of social reproduction, whereby the majority of the dispossessed were compelled to rely on the market for their subsistence and survival. It is hard to underestimate the uniqueness of this historical transition. Indeed, in excavating the origins of market economy, Karl Polanyi argues that this social transformation was so radical that it resembled 'more the metamorphosis of the caterpillar than any alteration that can be expressed in terms of continuous growth and development' from earlier forms of economy that were embedded in social networks (Polanyi 1957: 42). This led him to note further that 'previously to our time no economy has ever existed that, even in principle, was controlled by markets' (ibid.: 43). Although there were various

² See www.vaughns-1-pagers.com/history/world-population-growth.htm (accessed 14 June 2010).

³ Attempts to circumvent the market through various tactics such as gleaning, hunting or fishing were increasingly criminalized in the centuries following the series of enclosures.

attempts by political authorities around the world to mitigate, control and/or direct market forces throughout the twentieth century, by the century's end it had become possible for Stephen Gill to characterize the global political economy as a neoliberal market civilization (Gill 1995a). Gill has identified some of the initial features of this market civilization, arguing that the neoliberal market civilization that emerged in the wake of the Cold War was characterized by the increasing polarization of wealth and life chances, a belief that self-actualization could largely be achieved through consumption, and the potential for widespread ecological devastation if notions of development continued to be premised on generating economic growth. He concludes the piece by asking whether a neoliberal market civilization can be called a 'civilization' at all, given that this pattern of social reproduction and political economy not only is unsustainable but that it also demonstrates many morbid symptoms.

These are all important insights, but one crucial aspect of market civilization is not highlighted in Gill's essay: the fact that the emergence and social reproduction of this civilization was and is wholly dependent upon affordable, accessible and abundant fossil fuels. Oil, coal and natural gas have become so central to the global political economy that it is perhaps more appropriate to characterize world society as a petro-market civilization, albeit recognizing that the access and use of carbon energy is highly uneven.

One indication of this is the fact that the oil and gas industry is the second largest sector of the economy in the world by market capitalization, standing at \$3.153 trillion in 2010.⁴ If we add the estimated value of state-run oil and gas companies, then this sector is by far the largest in terms of market value, at roughly \$6.729 trillion.⁵ What this suggests is that investors and state managers not only realize the centrality of energy for development prospects but also anticipate that these publicly traded and government-run firms will continue to generate earnings by shaping and reshaping a terrain of social reproduction heavily dependent upon fossil fuels. Since the value or capitalization of these firms is contingent on their profitability, it can be concluded that those in charge of and invested in the largest sector of the global economy – the one that virtually undergirds almost every other sector – have no interest whatsoever in

⁴ 'FT Global 500 by sector', <http://media.ft.com/cms/5d78d01a-68b9-11df-96f1-00144feab49a.pdf> (accessed 30 June 2011).

⁵ The 'FT non-public 150' estimates the value of state-run oil and gas firms in 2005, and I have adjusted the figure here, to account for inflation, to \$3,576 trillion; www.ft.com/cms/s/2/5de6ef96-8b95-11db-a61f-0000779e2340.html (accessed 30 June 2010).

moving swiftly to post-carbon forms of social reproduction. In fact, the interests of 'big oil and gas' and 'King Coal' run in exactly the opposite direction.

A second indication of how central fossil fuels are to the social reproduction of a market civilization comes from considering the fact that 82 per cent of the world's total primary energy supply consists of fossil fuels. Moreover, 68 per cent of global electricity generation is powered by fossil fuels, while the total final consumption of fossil fuels relative to other fuel sources was 67 per cent in 2008 (IEA [International Energy Agency] 2009: 6, 24, 28). Rather than declining, demand for fossil-fuel-based energy is **forecast to increase dramatically in the coming decades**, while **alternative energy sources are estimated to make up only a small fraction of the world's total primary energy supply**. In addition, the IEA argues that 'some \$22 trillion of investment in supply infrastructure is needed to meet projected global demand' for energy (IEA 2007: 42). In sum, fossil fuels are projected to continue to be central to the **social reproduction of a market civilization in the twenty-first century**.

Third, the current world food system – how humans obtain energy – is **wholly dependent upon cheap fossil fuels at every stage of the supply chain: producing, harvesting, processing, packaging and distribution**. One calculation estimates that 'the modern food system consumes roughly ten calories of fossil fuel energy for every calorie of food energy produced' (Heinberg 2005). What this means is that those fortunate enough to purchase a daily diet are essentially 'eating oil', as suggested by one of the first studies to investigate the degree to which the US food system depends upon cheap petroleum (Green 1978; Pfeiffer 2006). Indeed, not only is oil necessary to run the industrial equipment and farm machinery used to produce food, but the fertilizers, herbicides and pesticides made necessary by large-scale industrial farming are all produced with oil or natural gas. In addition to this, most of the world's food travels thousands of miles and is transported by a global fleet of diesel-burning trucks, and in some cases refrigerated cargo jets. Although this system may be profitable for corporate food giants such as Nestlé, Unilever and Monsanto, it places global society in a highly vulnerable position, since the social reproduction of all communities that are not direct producers and consumers of food is heavily dependent on the corporate sourcing and provisioning of food (Barker 2007; Patel 2008).⁶

Finally, many have observed that technological advances in transportation and communication have led to a more globalized world, in which

⁶ Subsistence farmers, or those who eat only what they grow, constitute the only sector of the population that is outside the global food regime.

space and time have been compressed. However, although the communication infrastructure of the world may not be as energy-intensive as some processes, the current transportation infrastructure of global trade is one of the most energy-demanding.⁷ The social transition away from localized economies and incidental market exchanges to a global economy of market compulsion has made the social reproduction of most societies heavily dependent on plentiful and reasonably priced carbon energy. As Vaclav Smil, the eminent scholar of technical advances, has pointed out (2007: 373–4), ‘Moving billions of tonnes of fuels, ores, other raw materials and foodstuffs, as well as astonishing varieties of goods, across national borders’ is wholly dependent on two primary movers that are ‘fast, inexpensive’ and allow for ‘mass-scale intercontinental travel’: diesel engines and gas turbines. For example, there are currently some 90,000 cargo supertankers that travel the world’s oceans; all are powered by ‘diesel engines as powerful as land-based power stations’ using ‘the lowest-quality fuel’ (Vidal 2009). Should the price of transporting all these goods become unprofitable or too expensive for consumers, continuing this regime of trade would be senseless from a business standpoint.

In sum, both international markets and fossil fuels have become so central to the social reproduction of global society that it is perhaps now banal to suggest that world society is the first and last petro-market civilization. In other words, given that oil, natural gas and coal are non-renewable resources and that there are no known primary energy sources to replace them on the scale necessary to sustain, let alone deepen and extend, this high-energy intensive model of development, we have to consider this civilizational order historically exceptional and transitory. Even the IEA – the institution responsible for advising Organisation for Economic Co-operation and Development (OECD) countries on energy policy – notes in its *World Energy Outlook 2008* that ‘global trends in energy supply and consumption are patently unsustainable – environmentally, economically, socially’ (IEA 2008: 3).

If the ‘age of fossil fuels’ and the emergence, spread and deepening of a global market civilization developed together, as I have suggested, then it is reasonable to investigate some of the consequences of a civilizational order whose social reproduction is contingent on what will become a more scarce and more expensive primary energy resource.

⁷ However, in a recent report Greenpeace has documented how Facebook and Apple are relying on coal-fired energy plants for their data storage facilities; see Henderson 2010.

The consequences of petro-market civilization

The global transformation away from social reproduction heavily dependent on international markets and non-renewable energy poses immense challenges for leadership and communities the world over. Below I provide a sketch of some, but by no means all, of the important consequences that this form of social reproduction has generated.⁸ To do so is to begin to recognize, as many already have, the scale of the transformation required of industrialized market society.⁹

The first and perhaps most obvious consequence of the transition to a petro-market civilization was an end to self-provisioning and the immediate and direct contact with nature. This is not to idealize the past or to suggest that earlier forms of social reproduction were in some way superior and need to be returned to. However, it is to suggest that modern survival and lifestyles are now dependent upon having access to goods and services for purchase on the market. One glaring indication of this transition has been the demographic shift away from a world society in which the majority of the population is primarily rural to one that is increasingly urban or suburban and – for over 1 billion people – consists of living in slums.¹⁰ There are many explanations for this ongoing transition, but what it signals is that more and more people are being disconnected from the land and the livelihood it might have provided. What exacerbates our reliance on the market is the fact that a petro-market civilization and the concomitant explosion in global population has contributed to an extensive division of labour and specialized forms of skills and knowledge. Although this extensive division of labour no doubt contributes to global productivity, it also means that very few of the world’s population have the knowledge and skills necessary to provide for themselves if markets break down or prices escalate out of control. This is all the more important when it comes to the question of food security, as the recent series of food riots attest (Doyle 2008; UNEP [United Nations Environment Programme] 2009).

A second consequence of a modern market economy heavily dependent on fossil fuel is the fact that centuries of public and private investment have produced built environments that are largely centred on cheap fossil fuels. The dimensions of a built environment created by

⁸ One important consequence not explored here is the turn towards industrialized mobile warfare during the age of oil, and what some call postmodern war (Latham 2002).

⁹ This recognition is widespread, but perhaps the leading organization promoting the transition to a post-carbon society is the Post-Carbon Institute. See www.postcarbon.org.

¹⁰ See Vidal (2010). The UN notes that one-half of the world’s population currently resides in cities, with the level projected to increase to over 79 per cent by 2050.

and dependent on fossil fuels are vast: the construction of thousands of miles of roads, docks and ports for intercontinental shipping, suburbanization, the construction of McMansions and the retrofitting of cities for car culture, the paving over of arable land for shopping malls and car parks, the destruction of or underinvestment in public transit networks and the construction of industrial parks, large-scale machine-cultivated farms, national airports, coal-fired electricity generation stations, gas stations, chemical plants, massive retail and grocery outlets, and vacation resorts are just some examples. What these human-made and machine-facilitated environments may suggest to future anthropologists is that those in control of investment and policy decisions had a very unsustainable and myopic view of the future. Although there are attempts and incentives to create green cities, there is an equal if not greater trend towards suburbanization in many of the world's cities. In the words of UN-Habitat (2010):

Urban sprawl has a negative impact on infrastructure and the sustainability of cities. In most cases, sprawl translates to an increase in the cost of transport, public infrastructure and of residential and commercial development. Moreover, sprawling metropolitan areas require more energy, metal, concrete and asphalt than do compact cities because homes, offices and utilities are set farther apart. In many places, urban sprawl encourages new developments that cause significant loss of prime farmland. When cities are improperly planned urban sprawl also adds to environmental degradation.

To sum up, transitioning away from the petro-soaked built environments of the last century will be very difficult without long-term public planning and significant capital investment that reverses trends such as suburbanization.

A third consequence of a petro-market civilization is the warming of the planet and ongoing environmental degradation. As the United Nations Development Programme (UNDP) states in its flagship report, anthropogenic global warming is a scientific fact. Carbon-fuelled economic activity, leading to the release of greenhouse gases into the atmosphere, is the chief contributor to the rise in global temperatures. Although some of these gases are naturally present in the atmosphere, humans have contributed massively to the warming of the planet by boosting their atmospheric concentrations, primarily as a result of burning fossil fuels for industry and transport and, to a lesser extent, by cutting down forests (IPCC [Intergovernmental Panel on Climate Change] 2007: 36). Not surprisingly, rich nations and a global consuming class of roughly 1.7 billion people account for a disproportionately large share of global emissions (UNDP 2007; Worldwatch Institute

2004). Although there have been some international attempts at climate cooperation – the Kyoto Protocol and now the non-binding Copenhagen Accord – leading scientists have emphasized that the commitments made so far are not enough to confront the challenges of global warming (see Chapter 5, by Richard Falk). For this reason, both the UNDP and the IPCC have argued that global society must not only seek out ways to reduce greenhouse gas emissions but also find strategies that will assist communities to adapt to unstable weather patterns.

However, the major problem is that, despite mounting popular awareness, world carbon dioxide (CO₂) emissions are projected to increase at least until 2030, and, many believe, beyond (IPCC 2007: 44). The consequences of climate change are potentially dire, though difficult to predict with certainty, since each region of the world will be affected in different ways. For instance, the IPCC argues, with varying degrees of confidence, that many parts of the world will suffer flooding, drought, the loss of biodiversity, coastal erosion, wildfires, the spread of new diseases and a possible reduction in crop productivity should temperatures continue to rise. Moreover, the UNDP has argued that many of these calamities are already ongoing in the poorest countries of the planet, with 'estimates of the numbers of people who will be forced to move as a result of climate change...ranging from 200 million to 1 billion' (UNDP 2009: 45). Some analysts also believe that, as warming continues, new regions will open up for resource exploitation, leading to increasing competition and perhaps militarized disputes for these new resources (Elhefnawy 2008; Klare 2009).

Neoliberal governmentality

Current trends, then, are patently unsustainable. However, the scale of the social transformation needed to move towards a post-carbon pattern of social reproduction is enormous, and demands nothing less than bold global, national and local community participation and leadership. I would like to suggest here that, although civil society organizations and policy-makers recognize the severity of the task, the solutions currently being proposed are issued from neoliberal governmental discourses that may exacerbate the looming crisis of social reproduction. Neoliberal governmentality is a method and strategy of rule that prioritizes the anarchy of private enterprise, economic growth, market mechanisms and individual responsibility over long-term democratic public planning for sustainable forms of social reproduction.

A recent study has suggested how entrenched and widespread neoliberal policies are, while others have elaborated on and refined

Michel Foucault's initial investigation of neoliberal governmentality (Burchell, Gordon and Miller 1991; Saad-Filho and Johnston 2005). My own purpose here is not to assess these interventions but, rather, to offer a brief conceptualization of neoliberal governmentality and then to show how this mode of rule approaches some of the challenges mentioned above. The politico-strategic rationality that animates neoliberal mentalities of rule starts from the notion that human beings are individual rational actors who pursue their interests by making cost-benefit calculations. For neoliberals, it is impossible for public policymakers to know the individual interests of each person, let alone the sum total of these interests. This leads neoliberals to argue that complex societies should be coordinated by price signals in the market, since these are the most effective and efficient conveyors of information. Moreover, as markets are the primary conveyors of information and allocators of goods and services, they should not be limited by spatial or political boundaries, since this would distort information and constrain human possibilities.

In this rendition of human purpose, there can be no shared, collective or planned vision for a political community to achieve other than preparing for market competition. For neoliberals, to do so would be anathema, because it would imply that some individual or group is imposing its own will on everyone else. However, this starting point is not grounded in an empirically verifiable human nature or ontology for neoliberals; it is a norm or state to be achieved by actively creating the productive constraints that will provide the guidelines and rules for shaping human behaviour, so that it increasingly resembles the behaviour of an imagined *Homo economicus* abstracted from natural limits. In other words, neoliberals are not against planning, as they want to arrange liberty artificially so that individuals can compete to pursue their own ends; however, they are against particular forms of planning that would have individuals directed towards some specific end not of their choosing. What this means is that the utopian goal of neoliberal governmentality is a political community of entrepreneurial firms and individuals that should largely govern themselves according to their interests, defined as financial or material gain. In doing so, these activities are presumed to generate economic growth. However, this politico-strategic rationality is not just directed at creating the conditions of existence for calculating individuals. The government itself is supposed to be subjected to the same market criteria or imperatives. Policies are to be assessed and audited based on their ability to foster private enterprise. Government programmes are to be evaluated for their costs and what they return to the political community, and against the

possibility that market forces would be better allocators of publicly provided goods and services.

For this reason, some of the main tactics and techniques employed by neoliberal governors include commodification, privatization, deregulation, 'responsibilizing' individuals and creating incentives for firms. What this means in the context of the looming crisis of social reproduction is that market mechanisms and the consumer and investment choices of individuals and firms will be responsible for meeting the challenges of a post-carbon world order (Bernstein 2002; Conca 2000; Levy and Newell 2002; Mansfield 2004). For example, in place of a coordinated government programme designed to prepare populations for the end of a highly energy-intensive consumerist lifestyle and drastically reducing greenhouse gas emissions, individual responsibility is promoted. These include attempts at reducing personal consumption, conserving energy, recycling waste, buying green organic products, retrofitting houses for energy efficiency, promoting the use of reusable shopping bags, green reskilling and encouraging home gardening, just to mention a few initiatives.

At the level of the firm, incentives are currently directed at promoting a corporate-led green capitalism while at the same time continuing to promote the discovery and extraction of fossil fuels for energy use. Policies to encourage green capitalism include mandating greater fuel efficiency and hybrid cars, funding the research and development of carbon-sequestration and green technologies to control pollution and liberalizing energy markets and making them more competitive. A look at some leading energy policies from the United States and the European Union shows that they also include incentives for firms to exploit renewable energy opportunities in solar, wind, biomass, geothermal, hydro-electric and tidal power, with some claims that renewables should make up a certain percentage of the total primary mix by a given date (White House 2010). For instance, on this last point, the European Union's energy policy aims to have 20 per cent of its primary energy come from renewable sources by 2020 (European Commission 2010). Another leading policy response to global warming has been the promotion of cap and trade systems that allow corporations to pollute up to a point and thereafter purchase permits for additional pollution (Bond 2008).

In other words, neoliberals undoubtedly recognize that a form of social reproduction reliant on fossil fuels and ecological degradation poses significant challenges. The question is this: are neoliberal policies that privilege individual responsibility, private enterprise and market mechanisms capable of preparing world society for a post-carbon-dependent social order within a timeframe that avoids serious crises?

Conclusion: neoliberalism will not save us

There are at least four major reasons for doubting whether neoliberal leadership can provide the solutions. First, relying on the individual investment decisions of firms and their investors to move world society rapidly towards a post-carbon future appears misguided given the rate and scale of change required. Consider, for example, what would have to be done just to replace fossil fuels as a primary energy source (Assadourian 2010: 7):

In order to produce enough [solar] energy over the next 25 years to replace most of what is supplied by fossil fuels, the world would need to build 200 square meters of solar photovoltaic panels every second plus 100 square meters of solar thermal every second plus 24 3-megawatt wind turbines every hour nonstop for the next 25 years.

Obviously, such an intensive post-carbon energy project is currently not under consideration, despite some minor efforts by governments and companies to create incentives for renewable energy endeavours.¹¹ Moreover, the scale of investment required to move towards a sustainable green economy is enormous and cannot depend on the whims and speculations of investors and banks with short-term profitability horizons. After some initial excitement in green companies in the first decade of the century, the Renewable Energy Policy Network for the 21st Century (REN21) noted that, during the financial crisis of 2008, the market capitalization of green firms collapsed. According to its recent report (REN21 2009: 15), 'Renewable energy companies closed plants, laid off workers, lowered sales forecasts, reduced production, and revised expansion plans for 2009 and beyond.' In other words, although there has been some expansion of green companies, these firms are largely dependent on speculative finance for their growth (Harvey 2010).

The second set of causes for concern involves investors and firms. First, not all so-called renewable energies appear to be either desirable or sustainable. For example, the recent rush to convert land for biofuel crops such as corn and sugarcane has come under considerable scrutiny, with some studies showing that producing such fuels provides little to no net energy, leads to increasing food prices and has the potential to destroy biodiversity as rainforests and other habitats are destroyed to produce the cash crops (Runge and Senauer 2007; Scharlemann and Laurance 2008). Second, it is well known that manufacturers are often

not required to internalize the costs of their environmental damage. This makes the costs of goods artificially cheaper and could encourage more fossil-fuel-dependent consumption. Furthermore, fossil fuel companies are infamous for funding climate change scepticism and lobbying government officials for business-friendly policies (Newell and Paterson 1998). According to Erik Assadourian (2010), 'Between subsidies and externalities, total support of polluting business interests was pegged at \$1.9 trillion in 2001.' A third cause for concern is that modern investors routinely discount the future as a matter of course. This process is called capitalization, and it involves using a 'discount rate to reduce a stream of future earnings to their present value' (Nitzan and Bichler 2009: 183). What this means is that investors have a technology by which to anticipate the future. If they anticipate that peak oil and global warming are facts that will have future consequences for their investments, they will take these events into consideration – however unpredictable the precise consequences may be (Bichler and Nitzan 2010: 7). What this means is that, far from leading a charge towards alternative post-carbon forms of social reproduction, investors can discount the future consequences of fossil fuel development patterns into their present asset values.¹²

Third, neoliberal governmentality does nothing to challenge an economic system premised upon growth and consumption. In fact, most neoliberal policies have the stated objective – and this is true of Keynesian stimulus packages as well – of promoting growth and consumption (Hamilton 2004). Thus, although alternatives may be constructed on the margin of the global economy (e.g. wind and solar farms), so long as global society is organized around a system of production, distribution and consumption based on fossil fuels, the spatial spread of markets and private profit and accumulation, we can expect that little will be done to move society towards a post-carbon future with a different set of post-consumerist values.

A final problem with neoliberal governmentality is its reliance on individual responsibility. In this instance, neoliberal governors rely on individuals to choose green and sustainable lifestyles. However, not only can individuals choose the opposite, but there are also many structural obstacles to overcome that individuals may have very little power to change. For example, not everyone has the ability to afford nutritious organic food, nor do individuals have much of a say in what kinds of food their community will be supplied with by the food industry. In other words, prioritizing individual agency without dealing with structural

¹¹ Sweden might be the exception (see Vidal 2006).

¹² See Whitehorn and Leggett (2009). They plead with their audience and the government of the United Kingdom to consider the business risks of peak oil.

obstacles is unlikely to affect the real change required to develop a post-carbon form of social reproduction.

There are, of course, no crystal balls to peer into, but if current trends continue we can expect the crisis of what I have called a petro-market civilization to be severe and protracted as societies scramble to adjust to a world of increasing energy prices and energy scarcity. As I hope to have made clear, both the *rate* and the *scale* of the necessary adaptation and social change are greater than what neoliberal policies can hope to accomplish. Although it may seem banal to say so, in the future we will all live differently. Whether new forms of sociality will be socially just, humane and civilized or whether populations descend into competitive forms of barbarism is an open question. Given past human achievements, there are many reasons to be hopeful; but there are also plenty of reasons for trepidation.

5 Global climate change, human security and the future of democracy

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Richard A. Falk

Summary

This chapter focuses on climate change, a key part of the global crisis that exemplifies failures of global leadership. It explores the implications of climate change for democracy and human security. The context for the argument is that the current global crisis poses unprecedented challenges because of its severity and multidimensional character, as well as the absence of either an ideological consensus or effective hegemonic management of global policy formulation and implementation. Global history during the last several centuries has been dominated by Eurocentricism, short-term security and political economy challenges, and violent geopolitics that caused devastation and massive suffering but did not undermine fundamental world order structures.

This comparatively simple framework is being increasingly drawn into question. The *real* new world order has substantially eroded Eurocentric dominance of the policy agenda, the emergence of global warming as potential catastrophic threat has underlined the importance of long-range planning and investment, and the intensifying contradictions of neoliberal forms of capitalism appear to be generating a *systemic* crisis of adjustment, although market forces and government leaders are focused on viewing the current deep world recession as *cyclical* and thus to be corrected by restoring normalcy. Even if this cyclical interpretation seems convincing in the period immediately ahead, it will soon have to acknowledge the increasing displacement of neoliberal modes of production and investment by various forms of state capitalism, as epitomized by China. Also problematic in an original manner is the extent to which the economic preoccupations of leaders with the woes of profit-seeking businesses and financial entities and anguished workers has made it almost impossible to give appropriate parallel attention to the multiple effects of the growing ecological challenges associated with climate change, growing water scarcities and the prospects of peak oil. Beyond this, it is already evident that the most marginal and vulnerable peoples are destined to have their