

CLIMATE CHANGE MITIGATION IN FANTASY AND REALITY

SAMUEL DAY FASSBINDER

cassiodorus.senator@gmail.com

DeVry University, Chicago, IL

ABSTRACT. Current attempts at climate change mitigation do not amount to physical climate change mitigation because they are trapped in a logic of commodity fetishism, which is the dominant fantasy of the utopia of money. Policy options such as cap-and-trade schemes and carbon taxes, corporate ‘strategies’ such as the triple bottom line, and economic ‘solutions’ such as decoupling are all products of environmental accounting, which projects ‘sustainable’ fantasies at the global climate change problem while conforming to the fetishistic logic of the utopia of money. This essay will argue that, instead of pursuing the paths dictated by environmental accounting and accumulating tiny changes which won’t make a difference, we start by understanding what measures (and concomitant utopian visions) are necessary to produce physical climate change and proceed through a utopian conversation of what sort of society could enact those measures.

Keywords: climate; mitigation; utopia; money fantasy; accounting; sustainable

1. Climate Change and Climate Change Mitigation

One important milestone in the discovery of climate change, or so we are told on page 5 of Spencer R. Weart’s (2003) *The Discovery of Global Warming*, is that of the invention of the greenhouse gas hypothesis, credited to Svante Arrhenius of the year 1894. More atmospheric carbon dioxide, caused perhaps by increases in volcanic activity, would result in an (on average) warmer Earth. If, however, the amount of atmospheric CO₂ were to be cut in half, this might result in a new ice age. As Weart depicts it, though, the idea that climate change could be human-caused was to come much later.

Today the theory of anthropogenic climate change has become established fact, one that has climate scientists thinking of a disastrous age of ‘climate departure’ (Mora et al.) in which ecosystems are unable to adapt to sudden changes in both climate and weather. But what of climate change mitigation? If, presumably, climate change in this era is caused by extra carbon dioxide pushed into the atmosphere by human industry (as of January 2016 this increase amounted to an

additional 2.5 parts per million per year ('Earth System Research Laboratory')), then if we wished to avoid ecological disaster, we would find some way of reducing the amount of carbon dioxide pushed into the atmosphere each year. This, then, is the idea behind climate change mitigation.

The puzzle of all of this is that the world society which created climate change must now mitigate it. But what sort of understanding of world society would reveal its potential for climate change mitigation? A historical approach to climate change mitigation, incorporating a critique of society, will reveal the relationship between human world-society and climate change, as well as putting the need for climate change mitigation in historical context.

Here's how such a historical approach might proceed: throughout the vast majority of years of human historical time, climate change wasn't recognized as the sort of immediate problem that we see in it today. Thus it can be observed that the world-society of those times (up to, say, 1983, when the National Academy of Sciences released a report on climate change; see Weart 209) was not of such a form that would register concern about immediate and drastic changes in climate. In late-capitalist, industrial world society, however, climate change and climate change mitigation have indeed become 'going concerns,' especially after the Earth Summit in 1992 in Rio de Janeiro.

Late-capitalist world society doesn't, however, know how to carry out climate change mitigation, not in the sense in which climate change mitigation would actually mean a reversal of the primary trends indicating climate change (increasing atmospheric CO₂ to the extent of 2.6 ppm/year, rising and acidifying oceans, the simplification of both oceanic and land-based ecosystems, the ongoing release of methane clathrates from permafrost and from ocean floors, increasing weather disruption, increasing average temperatures and so on). For the purposes of this essay, such imagined reversals, when taken all together, will be called 'physical climate change mitigation.'

But the above definition of climate change mitigation is merely physical climate change mitigation. Another standard use of the term invites us to imagine 'climate change mitigation' as merely 'doing something green' with the implicit notion that late-capitalist industrial world-society, having caused the problem through its day-to-day operations, will add up all the nice green things that were done and magically produce physical climate change mitigation. In its simplest form, one sees this approach in the UNEP webpage on climate change mitigation (UNEP): there, readers are told that climate change mitigation 'can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior.' Nowhere on this page is it shown how 'climate change mitigation' will actually mitigate climate change, in the sense in which if a few of us were to increase our energy efficiency or buy solar panels or consume a bit less (by 'a few of us' is meant members of privileged classes, in a world in which half the population is said to live on less than \$2.50/day and in which the 'wealthiest 10% owns 85% of global household wealth' (Peebles)), the

changing variables constituting climate change would somehow magically slow down.

The privileged classes are to be motivated into creating this 'climate change mitigation' future, moreover, mainly through what environmental accountants call 'public policy options,' each of which, individually or even together, are too timidly adjusted to the status quo utopia of money to produce physical climate change mitigation. In his (2016) book *Climate Change: A Wicked Problem*, Frank P. Incropera summarizes 'three options' in the environmental accounting policy approach (148). First is 'to put a price on emissions' which encompasses cap-and-trade or carbon taxes, neither of which by themselves will accomplish anything of importance, as discussed below. Second is to 'mandate reductions through the regulatory process,' and the examples Incropera gives are nothing close to the positive restructuring needed to eliminate the fossil economy where it needs to be eliminated, as discussed below. Lastly, public policy is to 'provide financial incentives' without reference to the environment of incentives which drives a world of increasing atmospheric carbon dioxide today.

Reinforcing a commonly-accepted, ineffectual definition of climate change mitigation is the tacit notion that global leadership, in government, in science, and in business, acts to produce 'climate change mitigation' according to some mystical doctrine of 'realism' about what can be done politically or economically. In this regard, human thinking about climate change, about mitigation, and about world-society is dominated by fantasies inherent in the economic status quo of this era.

2. Statement of the Problem

Climate change reports would typically have you believe that the problem is cut and dried. Climate change is happening, people are causing it, and we have to do something. In reality the dominant discourse about climate change mitigation offers its audience what Healy (2014) calls 'an easy way out,' without any meaningful explanation of the connection between 'climate change mitigation' (as explained by UNEP and others) and physical climate change mitigation. The gap, then, is filled by collective fantasy, which in late capitalist society is occupied by commodity fetishism.

Commodity fetishism, strictly speaking, is the general social obsession with markets, both in consumption and in production, as the ultimate arbiters of human affairs. It is the requirement that everything be done through the market, forced into a consciousness that sees everything as a commodity and everyone as an entrepreneur. The commodity, in this regard, is any item produced for the market. Commodity fetishism has today reached global proportions; this is what we now call 'globalization,' the integration of human affairs into a 'global free market.' With globalization comes a collective fantasy of commodity fetishism, which is the idea that all of our desires will be met and all of our problems will be solved through the trade of commodities, as they are said to contain 'value' (whether

expressed as monetary value, or as value expressed through some hypothetical dollar amount).

To oppose the spell cast by the collective fantasy of commodity fetishism, the argument proposed in this essay will examine, firstly, how 'climate change mitigation' is constructed within the boundaries set by the spell. The collective fantasy has its root in the valuation of nature, which (in the case of 'climate change mitigation') defines 'greenhouse gas emissions' as a pollution problem without mandating a shutdown of the polluting industries. Imagine, on the other hand, that world governments were to treat climate change like it were a toxic waste spill, of obvious harm to the public and of limited geographic scope. At some point, after a government-engineered adjustment period, there would be a cease-and-desist issued to the fossil fuel industries, after which they would no longer be allowed to extract fossil fuels. But that isn't what's happening, nor is such a remedy even being proposed by any agency of empowered policymaking.

What's happening is that, with environmental accounting approaches having dominated the discussion of climate change, the effects of global climate change are defined as 'costs' without reference to whether or not 'paying' anything will physically mitigate climate change. In the fantasy environment promoted by the advocates of 'sustainable capitalism,' environmental accounting is popularized to promote 'achieving environmental sustainability through fiscal policy,' or through benevolent-seeming corporate 'triple bottom line' initiatives, without reference to the creation of an actual future world which (ostensibly) achieves physical climate change mitigation.

Environmental accounting, however, as suggested above, starts from conformist premises, as it is an attempt to direct the status quo fantasies of commodities and money and property in the direction of environmentalism. Here one must recall that accounting, in a first-year-accounting-student sense, is the computation of monetary profit using calculated values in balance sheets by subtracting costs from revenues. The idea of environmental accounting, then, is that all aspects of 'the environment' can be assigned monetary values such that the fantasy of 'climate change mitigation' can be added to the ongoing designation of the world as a collection of commodities and a cornucopia of value according to some imagined balance-sheet of environmental health.

Moreover, the statistical baby-step of 'decoupling,' used to proclaim progress toward a 'post-carbon world,' is calculated by massaging economic statistics to suggest the relevance of environmental accounting without showing a trend toward physical climate change mitigation. In general, then, fiscal and/or corporate policy will, toward the fantasy of sustainable capitalism, operate to promote 'behavior modification' without comprehensive reference to the background of real behavior modification (i.e. induction into universal commodity fetishism through the 'global free market') going on under capitalism.

Secondly, this essay will examine the commodity fetishism motivating this fantasy, both as a social and economic phenomenon in need of definition (I will

consult Marx) and as a motivation for the conceptual apparatuses of ‘environmental accounting.’

Lastly, an alternative collective fantasy will be proposed, centered around an alternative to a society based on commodity fetishism involving a ‘union of free producers’ as specified in Marx’s *Capital*. The problem is not that we have a collective fantasy and are thus insufficient realists, but rather that our currently-dominant collective fantasy has been shaped to fit capitalism, and is thus inadequate to the task of physical climate change mitigation. This essay will thus conclude with an exploration into the possibility of a new, efficacious global collective fantasy, through utopian dreaming and utopian studies.

3. The Valuation of Nature as a Collective Fantasy

The history of fantasy ‘climate change mitigation’ is summarized admirably in a multi-authored essay titled ‘Beyond Paris: Avoiding the Trap of Carbon Metrics’ (OpenDemocracy.net, 2/8/2016). The thesis of this piece is stated at the top: ‘Instead of changing our economic system to make it fit within the natural limits of the planet, we are redefining nature so that it fits within the economic system.’ The piece itself depicts a history and sociology of ‘carbon metrics,’ a system of measurement which attempts to simulate ‘climate change mitigation’ without questioning the economic form taken by late-capitalist industrial world-society. The authors of ‘Beyond Paris’ identify the starting-point of carbon metrics as follows:

‘At the Earth Summit in Rio de Janeiro in 1992, a “silver bullet” was found to tackle climate change: reducing CO2 emissions. Accordingly, the goal was to make cars and household appliances, power plants and entire industries more efficient. This “end of pipe” approach (by which contaminants are removed at the end of a process) deflected political attention away from the causes of climate change and allowed policy makers to deal only with the symptoms in the form of emissions.’

The capstone achievement of the ‘carbon metrics’ approach, in the hands of the global political class, is the Kyoto Protocol, adopted in 1997 and put into force in 2005. The ‘success’ of this approach has so far been in gratifying the core states, the states whose leaders ostensibly care the most about this issue, with nice-looking ‘low numbers’ which are largely due to the imperialist removal of industrial cycles to peripheral nation-states within a regime of global capitalism. Steffen Boehm, from ‘The Paris Climate Talks and other Events of Carbon Fetishism’ (Steffen-boehm.net: 4 December 2015), explains:

‘If a consumption-based approach to carbon accounting is taken, the UK’s national carbon emissions would be twice as high as officially reported. This is also true for most Western European countries as well as the United States, which have seen increasing rates of deindustrialisation

over the last two decades with not only jobs but also carbon emissions being offshored to countries of the Global South. In return the West is receiving cheap consumer goods whose embedded carbon emissions are not attributed to itself. A clear form of carbon colonialism.'

Thus one point of fantasy 'climate change mitigation' is to make its proponents look good by their own metrics, which offer 'safe' statistics unrelated to the actual production of climate change.

Perhaps the apogee of 'safe' statistical concepts on climate change today is 'decoupling,' the idea that a particular nation's (or the world's) GDP, or gross domestic product, can increase while its 'carbon emissions' can stay flat or decrease. 'Decoupling' is said to hint at the possibility of a 'post-carbon world' through the idea of 'peak carbon emissions.' Mild forms of 'decoupling' have been observed over the period 2000–2014 in statistics from 22 nations (Aden) and globally from 2015 statistics (Jackson et al.). However, GDP measurements do not typically account for asset inflation (Ross) and the 'decoupling' trend cannot be said to have progressed in any way beyond the mild form observed in the Jackson et al. paper. The fantasy of looking good through the production of nice metrics, however, itself has an explanation, emanating from the core of capitalist life. Erik Swingedouw, author of a critically-important piece on climate change ('Apocalypse Forever? Post-political Populism and the Spectre of Climate Change,' *Theory, Culture, and Society* 27 (2010): 213–232) suggests that what has passed for climate change mitigation today is the 'commodification of CO2,' (220), dovetailing with a status-quo defense of capitalism:

'CO2 becomes the fetishized stand-in for the totality of climate change calamities and, therefore, it suffices to reverse atmospheric CO2 build-up to a negotiated idealized point in history, to return to climatic status quo ex-ante. An extraordinary technomanagerial apparatus is under way, ranging from new eco-technologies of a variety of kinds to unruly complex managerial and institutional configurations, with a view to producing a socio-ecological fix to make sure nothing really changes.'
(222)

The whole point of such a strategy, as Swingedouw points out, is to attain an 'environmental consensus' which is 'radically reactionary' (228). Needless to say, observers of the actual history of atmospheric carbon dioxide growth are obliged to note that the growth in carbon dioxide emissions can't be said to have stalled over the long run (see e.g. 'IPCC press release 13 April 2014') suggesting that no medium-term progress toward climate change mitigation has in fact been made even by the standards of the carbon dioxide measurement fetish. This history evidences the defective nature of the fantasy of 'climate change mitigation.'

And histories of the analysis of physical climate change as it has taken place on planet Earth are themselves likely to cite a paper in the *Bulletin of the American Meteorological Society* ('Awareness of Type 1 and Type 2 Errors in Climate

Science and Assessment,' September 2014: 1445–1451) suggesting that the processes by which the IPCC estimates climate change are themselves biased in favor of conservative results which underestimate the extent and rapidity of climate change. A piece in the Washington Post (Mooney) explains this bias in the reporting: the writers of IPCC reports are pressured by deniers, but not by those who think their reports underestimate climate change. The conservatism of the 'climate change mitigation' fantasy, having taken over economic and political understandings, has invaded the meteorological assessment of the climate change problem.

Thus the problem of 'climate change mitigation' being determined by a collective fantasy is not a problem to be solved by a mere invocation of 'realism.' Since the effects of the collective fantasy have gotten into the scientific assessment of the problem, 'climate change mitigation' can only be set on the right track through an apprehension of the fantasy behind 'carbon metrics.'

4. The Value Problem in Climate Change Mitigation

To understand the world-society which can produce climate change and which can promote it as a topic of international concern but which can't mitigate it in any physical sense, we must understand how world-society pivots around the creation of value and the fetishism of commodities. In this regard, we must understand what I'm calling here the collective fantasy, or what Cornelius Castoriadis called (with less dramatic effect) the social imaginary.

This essay will still retain the idea of 'practical fixes' – merely because the 'practical fixes' which have been tried so far have not been effective does not mean that no efficacious practical fix is possible. However, we fail at physical climate change mitigation when we ask the question: 'how can climate change mitigation be achieved while changing as little as possible about world-society,' when a more appropriate question to ask would be one of 'what form of world-society will be able to physically mitigate climate change?'

In the fourth and last part of Chapter 1 of Volume 1 of *Capital* (a book still pointing to the underside of capitalism even though it was first published in 1867), Karl Marx points to the arcane attributes of the commodity as it circulates in market society, and of the value which it contains. According to Marx, the commodity is 'abounding in metaphysical subtleties and theological niceties,' it is 'transcendent'; commodities have a 'mystical character,' a commodity is a 'mysterious thing,' and value 'converts every product into a social hieroglyphic.' The reason for all of this occult vocabulary, explained later in the chapter, is that the 'money form of the world of commodities... actually conceals, instead of disclosing, the social character of private labour.' We do not think about world-society, implied Marx, because we perform 'private' labor even though our labor is in fact social. Money, value, and commodities, in this regard, operate to spread the

spell of privateness, of the private ownership that serves as the basis for market society.

Value is of course the name Marx gives for the ultimate desideratum of commodity fetishism, the reason for the mystical vocabulary used in *Capital* to describe the commodity. What will be ultimately clear here is that physical climate change mitigation is not a construct that can be composed of value, because the society that pursues fantasies of value obscures from itself the concrete nature not only of the social labor which it performs (and social labor will indeed become vitally important to the pursuit of climate change mitigation), but also of the physical world in which it lives.

In the portion of *Capital* dealing with commodity fetishism, however, Marx hoped to reveal at one stroke the nature not just of the commodity but also of the society which fetishized it. To do this, he first needed a utopian construct of his own:

‘Let us now picture to ourselves, by way of change, a community of free individuals, carrying on their work with the means of production in common, in which the labour power of all the different individuals is consciously applied as the combined labour power of the community.’

What’s noteworthy about this passage in the first chapter of *Capital* is not merely that private labor is exposed as the force behind commodity fetishism – but rather that Marx found it necessary to invent an example of another utopia – a world reconstructed in another form – in order to explain commodity fetishism (and thus also the concept of value).

Only if we can explain society as more than a sum of property-owning individuals performing private labor within labor markets can we understand what the whole society is doing. But Marx’s method is not an accident meant merely to explain that we need to look at capitalist society differently. Rather, Marx’s idea in this passage of *Capital* is to show that we need to be able to imagine how society could exist in another form if we are to make commodity fetishism visible in this society, and to show that we need to reconstruct society in another form if commodity fetishism is to lose its hold over us.

To apply this lesson to the problem of climate change mitigation: neither mild critique nor modest reform will transmute carbon dioxide fetishism into physical climate change mitigation. By contrast, a ‘community of free individuals,’ a utopian alternative to the present-day world society, may be free enough to invent real climate change mitigation. Rather than indulging in the fantasy that what businesses and governments are doing now constitutes climate change mitigation, we would do well to engage the fantasy of an eventual transformation of society (presumably along the lines of a libertarian eco-socialism, though those labels don’t say much) to make real climate change mitigation possible.

5. Climate Change in the Fantasy Architecture of ‘Sustainable Capitalism’

‘How can I go forward if I don’t know which way I’m facing?’ – John Lennon

The idea of ‘sustainable capitalism’ attempts utopian fulfillment of desires that there be a future as well as the generalized desire to continue with capitalism. Capitalism, today, sits atop its global throne as the utopia of money and the organizational manifestation of the fetishes of money, property, and commodities in this era of world history.

In this regard a global fantasy architecture of ‘sustainable capitalism’ has been erected, most specifically (as regards this paper’s topic) in the markets for ‘carbon credits,’ but also more generally in the public policy manifestations of environmental accounting. Rather than beginning with credible fantasies of what a sustainable world would look like and backcasting to understand what might be necessary to achieve them, environmental accounting projects ‘sustainable’ fantasies at the climate change problem.

The obvious difference between physical climate change mitigation and the environmental accounting version is that physical climate change mitigation requires an ultimately global *collective* response whereas environmental accounting is an *individual* or *corporate business* or *corporate fiscal* (putting government pressure upon businesses to conduct minor changes) response. Physical climate change mitigation will, on the other hand, require some form of social change, while environmental accounting merely demands that individuals and businesses change, with the expectation that the individual changes will somehow add up. Ultimately, environmental accounting names something as ‘climate change mitigation’ to set up a demonstration of green-ness as a public relations benefit through the purchase of green commodities of some sort – this is what ‘cap and trade’ is most distinctly about, proliferating carbon credits and carbon offsets and green technologies. Physical climate change mitigation must, on the other hand, accompany a visible transformation of world society toward a sustainable model.

In using the word ‘fantasy’ in the sense of ‘fantasy architecture,’ by no means do I wish to cast a negative connotation upon fantasy from any perspective of stodgy ‘realism’ which abjures fantasizing. The problem is not that human beings have a collective fantasy life – indeed the benefits of civilization would be unattainable if we did not engage collective fantasies. Rather, discussions of ‘realism’ in this historical era typically accept without question the existing, status quo collective fantasy life, centered upon money, power, and commodities, and tempered by minimal government regulation, and such ‘realism’ is argued here to be inappropriate to climate change mitigation. Fantasy, then, needs to be redeemed from status quo ‘realism.’

Within the public policy architecture of ‘sustainable capitalism,’ the idea of climate change mitigation, in the hands of the political class which passed the Kyoto Protocol, has become ensnared in our society’s obsession with value, the attribute which endows commodities with what Karl Marx called ‘commodity

fetishism.’ In this regard, socioecological realities have been disavowed in favor of reactionary responses both protective of the political status quo and evocative of capitalist desire. From the time of the passage of the Kyoto Protocol (1997) onward, the point of the global consensus about climate change (given the abstentions of the United States, Australia, and a number of other countries) has been not to mitigate climate change through a cease-and-desist and a shutdown of fossil fuel extraction activities, but rather to keep up appearances by commodifying CO₂, thus to promote a line of ‘climate change mitigation’ products, and by creating ‘a rapidly growing derivatives market of futures and options’ (Swingedouw: 220) for a class of financial speculators under the rubric of a ‘cap and trade’ scheme.

There may still be a vague connection between the commodities, the ‘carbon credits’ and ‘carbon offsets’ created in such schemes, and actual carbon dioxide, but Larry Lohmann, author of a comprehensive deconstruction of carbon trading schemes (‘Financialization, Commodification, and Carbon: The Contradictions of Neoliberal Climate Policy’) reveals the overlap both in methods and in personnel between the speculation in financial derivatives and the speculation in carbon credits and offsets to reveal that:

‘Carbon commodities work through a process of radical disembedding – in this case, disembedding the climate issue from the historical question of how to organize for structural, long-term change capable of keeping remaining fossil fuels in the ground.’ (90)

After describing in full detail the process of environmental accounting which justified the state-sanctioned, corporate-played game of ‘compliance’ with cap-and-trade schemes, Lohman concludes:

‘Thus just as complex derivatives markets lost touch with what they were advertised as being “about” (the provision of certainty), carbon markets have taken the climate issue and decontextualized, reengineered, and mathematized it until little of relevance to global warming is left.’ (98)

Markets, then, are about buying and selling, and references to climate change in a context of market domination are part of the production and fetishization of commodities.

A ‘carbon tax,’ moreover, as a growingly-popular alternative to cap-and-trade schemes of the Kyoto Protocol breed, will offer a substitute accounting for physical climate change mitigation (though perhaps a more efficacious one – unlike cap-and-trade schemes, carbon taxes do not build carbon consumption into the process of ‘mitigation’). Unfortunately, though, carbon taxes still rely upon old constructions of *homo economicus*, retaining world society’s ensnarement in the fantasy of ‘sustainable capitalism’ through the valuation of nature. John Bellamy Foster depicts the main flaw of carbon-tax strategies in a telling way in his critique of the James Hansen carbon-tax plan for mitigating climate change, titled ‘James Hansen

and the Climate-Change Exit Strategy' (*Monthly Review* 64: 9, February 2013: 1–19). Foster argues:

'Hansen's climate-change exit strategy thus has definite limitations. Despite its progressive features it is mostly a top-down, elite-based strategy of implementing a carbon tax with the hope that this will spur the introduction of necessary technological changes by corporations.' (11)

If Foster is 'off' in any way, here, it is because he understates his case: the 'necessary technological changes' (as well as necessary social changes, as Foster himself makes clear) turn out to be so profound and far-reaching, so much a creation of new natures out of the capitalist world, that the carbon tax can itself at best make only a very small contribution to the physical climate change mitigation cause.

A critical examination of commonly-given scholarly reasons for a carbon tax will, moreover, reveal that the 'behavior modification' ostensibly achieved by such a tax will appear as a minor adjustment to the ongoing behavior modification of the capitalist system itself. Carbon tax arguments thus create a space for inflated claims about the 'behavior modification' potentials of a carbon tax while perpetuating the collective fantasy of commodity fetishism.

As an example of this claim inflation, the essay 'Comparisons between the cap and trade system and carbon taxation' (Lee et al.) suggests:

'... a carbon tax encourages the reduction of carbon emissions, as companies would strive to avoid incurring large sums of taxes. The carbon tax would be an initiative for companies which currently overproduce carbon emissions to improve their habits or else pay for the damage.' (39)

Thus a carbon tax will attempt to reduce carbon emissions which are 'overproduced' – but how much of any particular firm's energy consumption involves the 'overproduction' of carbon emissions? With environmental accounting this number can be the smallest convenient one. A firm's expansion into a new market, for instance, will involve increased carbon emissions in the absence of any dramatically new energy production infrastructure, but will nonetheless not involve 'overproduced' carbon emissions – or at least that's what the firm's representatives will say. And to what extent are the 'large sums of taxes' merely going to be passed on to consumers?

Lee et al. continue their claims for a carbon tax as follows:

'The consumer could also be directly taxed depending upon the car that he or she drives and the fuels used, for example. Obviously, this could be a very useful method do to influence the way consumers begin to view carbon taxation. Behavior modification of the US population by carbon taxation is potentially one of the strongest benefits a carbon taxation policy can offer; individuals can make a significant impact on decreasing the carbon emissions. The production and sale of hybrid cars would

become more popular, as they both emit less carbon and use alternative fuels.’ (ibid.)

The argument here presumes some sort of vast reservoir of discretionary income for the ‘sale of hybrid cars’ (or other such alternative vehicles) among populations already impacted by capitalist discipline. A carbon tax, by itself, is not going to make hybrid (or electric) cars more affordable to large populations making survival wages by driving to and from work in fossil-fuel-burning vehicles. And how is such a tax going to do more (all by itself) than eliminate ‘optional’ fossil-fuel burning? Shouldn’t a climate change mitigation strategy aim for bigger cuts?

One can see, here, that the claims for a carbon tax are better made as claims for the benefits to be offered by the reconstruction of the world’s infrastructure. An alternative, probably more efficacious, plan can thus be imagined in light of the need to mitigate capitalist discipline as well as climate change. Instead of a carbon tax, give everyone an electric car in exchange for their existing fossil-fuel-burning vehicles and, at a certain date, shut down the gas stations. Have the government manufacture enough electric cars to replace the fossil-burning ones currently being used – don’t trust in ‘price signals’ to do what needs to be done. (Of course, such a plan would be a more radical transformation of the status quo than has been attempted so far. Its most telling deviation, though, is that even books specifically dedicated to climate change mitigation, such as the (2013) popular-audience volume *The Burning Question*, subtitled ‘We can’t burn half the world’s oil, coal and gas. So how do we quit?’ (Berners-Lee and Clark), can’t even be bothered to discuss such a solution.)

Without such alternative plans, and without the alternative collective fantasy necessary to make them happen, all we really have with ideas such as ‘cap and trade’ schemes and ‘carbon taxes’ is the potential for public-relations as promoted by prominent institutional actors toward the claim that they are ‘doing something.’

Beyond ‘environmental sustainability’ through fiscal policy, corporate initiatives in environmental accounting feature the ‘triple bottom line.’ This is a fashionable concept in business and government circles as an expression of corporate social and environmental commitments. Norman and MacDonald (2003) define the concept generally: ‘The idea behind the 3BL paradigm is that a corporation’s ultimate success or health can and should be measured not just by the traditional financial bottom line, but also by its social/ethical and environmental performance.’ (1) The problem with such an expression, as Norman and MacDonald point out, is that social and environmental commitments are not calculable in the way in which financial commitments are calculable. And so they conclude:

‘The concept of a Triple Bottom Line in fact turns out to be a “Good old-fashioned Single Bottom Line plus Vague Commitments to Social and Environmental Concerns”. And it so happens that this is exceedingly easy for almost any firm to embrace. By committing themselves to the principles of the 3BL it sounds like companies are making a more concrete, verifiable commitment to CSR and sustainability. And no doubt

many are. But it also allows them to make almost no commitment whatsoever.’ (13)

Ultimately connected to the calculation of corporate commitments to environmental goals is the fiscal philosophy of ‘true cost pricing,’ which involves the idea that environmental damage can be translated into an estimated (and then promoted) monetary cost, to be offered as a tax disincentive to try to make individuals and corporations ‘go green.’ With ‘true cost pricing,’ the one thing that really needs to be priced, the coming vast transformation of the world due to climate change, will in any instance elude dollar values. If the world were to experience the climate change nightmare scenario depicted in Mark Lynas’ (2007) book *Six Degrees*, with the collapse of civilization, would it matter at all if we were to put a dollar value upon the civilization thus lost, then to try to charge people for that dollar value? The point is that it wouldn’t, and so nobody need feel individual responsibility at the potential future collective loss such a (quite possible) disaster means to us today. Meanwhile the advocates of ‘true cost pricing’ dare not ruin the capitalist economy they assume beforehand.

As the previous examples show, bringing environmental accounting into macro-level focus has the effect of debunking it, and revealing the inefficacy of its fantasy content. An attempt to ‘show’ that some form of macro-level progress has been made in climate change mitigation surfaces today in the fashionable concept of ‘decoupling.’ The fantasy projected with ‘decoupling’ is that, if a year or two of climate change and economic statistics can be found statistically in which total global GDP (gross domestic product) can be found to increase while at the same time ‘global CO2 emissions’ did not, one can advertise the possibility of decreasing ‘global CO2 emissions’ indefinitely while continuing capitalist business-as-usual indefinitely as well. ‘Decoupling’ is thus the most wide-screen advertisement for sustainable capitalism yet devised. However, promotions of ‘decoupling’ have to be thin both in terms of economic and ecological elaborations of what is going on, simply because the ‘rare good news on climate change’ (as Gregory Wilpert phrased it in a *Real News Network* interview with climate researcher Nate Aden) has to be shielded from this debunking.

A well-publicized piece in the journal *Nature Climate Change* (Robert B. Jackson et al.’s ‘Reaching Peak Emissions’) argues that ‘rapid growth in global CO2 emissions from fossil fuels and industry ceased in the past two years, despite continued economic growth. Decreased coal use in China was largely responsible, coupled with slower global growth in petroleum and faster growth in renewables’ (7). Indeed, the authors do recognize that the cessation in growth of CO2 emissions is unlikely to produce anything better than the small decoupling they observe in their data without further action; in their conclusions they urge further action, although ‘action by whom?’ remains an open question:

‘Whether the unexpectedly low growth rates in CO2 emissions observed in 2014 and 2015 are a first sign of an approaching global peak in

emissions is unclear. Current INDC pledges suggest that, even if emissions were to peak soon, global emissions would still take years to decline substantively. An acceleration in the transformation of energy use and production is needed to set global emissions on course to complete decarbonization, as required for climate stabilization.’ (10)

But nonetheless the authors boast that, amidst all this stabilization of CO2 emissions growth, ‘global GDP grew at a stable rate of 3.3–3.4% yr⁻¹ during 2012, 2013 and 2014, and is projected to grow a further 3.1% in 2015.’ However, Jackson et al. don’t discuss what portion of this global GDP growth is due to asset inflation, which would boost value-numbers without itself being physical ‘economic growth.’ As Sean Ross at *Investopedia* points out:

‘Rising asset prices are potentially misleading signs of a growing economy. Even if the stock market grows or houses are more valuable, no real economic goods are directly produced. Those values are very sensitive and volatile, possibly creating the illusion of growth through asset bubbles.’

Manufactured ‘growth’ through asset bubbles, then, may be used to simulate ‘decoupling’ in a capitalist economy which may be, in physical terms, contracting, at least for the time being. The analysis of Robert Brenner (2002) suggests that, under neoliberal economic rules, asset bubbles operate as the primary motor for what is defined as economic growth.

A more recent study (Nate Aden’s ‘The Roads to Decoupling: 21 Countries Are Reducing Carbon Emissions While Growing GDP,’ *World Resources Institute*, 5 April 2016), moreover, shows which portion of the world is ‘decoupling,’ thus suggesting reasons why these countries are ‘decoupling.’ Many of these countries, including the United States and the wealthier countries of Europe, are ‘decoupling’ by exporting their industries to other portions of the world. Some of these countries (e.g. Germany) are actually ‘decoupling’ by increasing that portion of their energy consumption which is produced by alternative energy. Still others are ruled by ‘post-Communist’ regimes (Bulgaria for instance) which have modernized their industrial equipment. Perhaps some of this data points to ‘progress’; yet this is so only insofar as people invest in sustainable energy sources such as solar and wind power. On a global scale these national versions of ‘progress’ are at best more than canceled out by (for instance) yearly increases in oil production, from (as the EIA points out) 88 million barrels per day in 2010 to 93 million barrels per day in 2014, or (also for instance), the stripping of Earth’s regenerative ‘lungs’ through ongoing deforestation.

As with the ‘triple bottom line,’ the ‘decoupling’ concept is only marginally capable of pointing to ‘good news.’ In evaluating global ‘good news,’ however, global accounting concepts such as ‘decoupling,’ fiscal tools such as ‘cap and trade’ and carbon taxes, and corporate philosophies such as the ‘triple bottom line’ obscure rather than enlightening. Environmental accounting concepts are designed to extend the embrace of commodity fetishism over ‘environmentalism,’ conceived

in corporate terms as a new realm of public relations. Physical climate change mitigation can find more effective means in alternative global collective fantasies (which can run under names such as ‘libertarian ecosocialism’) as part of utopian movements. The remaining portions of this essay will lay out both status quo and alternative to show how universal commodity fetishism works to obscure the possibility of physical climate change mitigation.

Just as Marx suggested in chapter 1 of volume 1 of *Capital* that ‘so far no chemist has ever discovered exchange-value either in a pearl or a diamond,’ so also the Earth’s atmosphere, in chemically converting its surplus of human-released carbon dioxide into abrupt climate change, does not care about the exchange-values of carbon credits or carbon offsets. Nor, for that matter, does planet Earth care about the monetary value (trillions of fictitious dollars, exchanged by nobody) of the ‘true cost’ of an additional 50% or (eventually) 75% added by human beings to Earth’s atmospheric carbon dioxide endowment.

The sum result of climate change, expressed as a collection of climatic disasters (drought, flooding, plague, famine, mass migration and so on) will be the end-result of the disconnect between universal environmental accounting and the hoped-for physical mitigation of climate change which will not arrive through said environmental accounting.

6. Utopian Studies and Climate Change Mitigation

So what sort of fantasy, and what sort of dream of a utopian society, would be appropriate for world-society’s transition to a society capable of climate change mitigation? The language of utopia and of utopian studies might provide clues to the answer.

In discussing utopian studies as a conceptual tool to oppose a climate change mitigation society to our current society, an appropriate definition of utopia has to be found. Ruth Levitas (1990; 2013) following Ernst Bloch (1959/ 1986), suggests such a definition: ‘utopia is the expression of the desire for a better way of being or of living,’ (Levitas 2013: xii) or, more specifically, ‘utopia is how we would live and what kind of a world we would live in if we could do just that’ (Levitas, 1990: 1). The utopia, then, is a fantasy about the world, for the world, and not merely an individual fantasy about the self. And, as a world-fantasy, it serves as a potential tool for the physical mitigation of climate change.

Utopia also exists as a goal of an educational process, and in this regard we can look at the writings of Paulo Freire, who viewed utopia as a goal of the educational process. For Freire, utopia ‘was something to be sought, actively and persistently, by human beings on this earth, through reflective, dialogical action.’ (Roberts and Freeman-Mohr: 116) Freire argued that education was not a process meant to adapt students to some pre-given notion of the future, but rather that ‘the future does not make us. We make ourselves in the struggle to make it’ (Freire: 34). Utopian dreaming, as a locus for fantasy and for desire, thus was something he viewed as an

important part of our active participation in making the future. Moreover, insofar as education joins in the act of making the future, it opens up minds to the possibility of utopian studies, of considering the question at the beginning of this section of this essay.

The desire for a better way of living operates largely in present-day society as an individual or corporate desire for more money. Of course, money-fantasies are about what money buys, and not the money itself – if we all had more money, inflation would make less of our money. Perhaps out of loyalty to Marx’s concept of ‘value’ the utopia of money could be called the ‘utopia of value.’ Nonetheless there is a utopia of money, available to its possessors. Marx discussed this utopia in a very early (1844) brief titled ‘The Power of Money,’ in which money, as the ‘common procurer of people and nations,’ can turn the whole world into a servant of those who have the money to pay for servant-labor.

Another important problem with climate change mitigation as a commodity, in this regard, is that it’s at once too expensive and not interesting enough to attract the attention of any of those ostensibly benevolent billionaires, our society’s premier possessors of money, who might consider paying for it. Naomi Klein’s *This Changes Everything*, for instance, depicts how that most concerned of billionaires, Sir Richard Branson, still can’t be bothered to put significant money into climate change mitigation efforts (230–255). For the human race considered as a whole, Marx also emphasizes, the utopia of money isn’t a good deal; money is the ‘Money is the alienated *ability of mankind*.’ The possessors of money are able to manipulate that alienation to their own ends; the utopia of money’s vast working class experiences its alienation.

Most of us, as members of the working class, live as human commodities in the utopia of money, valued for our labor-power as purchased by those who can afford to pay, typically for-profit corporations or our governments; this is not counting ‘superfluous population,’ that portion of the people as a whole who can neither be, nor buy, human commodities, but who nonetheless must live within the architecture of a utopia of money. Such people must struggle for their existences on the margins of society. William I. Robinson (2014) argues:

‘One new structural dimension of 21st century global capitalism is the dramatic expansion of the global superfluous population - that portion marginalised and locked out of productive participation in the capitalist economy and constituting some 1/3rd of humanity.’ (179)

To a certain extent, though, the utopia of money has been increasingly able to establish itself on Earth, through the increasing access of commodities to ordinary people. The growth of capitalist society is typically promoted in utopian terms as ‘progress,’ or ‘development,’ and has been universally promoted as a solution for the material needs of human beings, though of course the extent to which one actually sees this solution typically varies with one’s attainment of class privilege.

One can praise this as a relative historical development, or one can criticize capitalism as a hindrance to the overall development of human beings (as Marx did); however, one task of this essay is to critique the applicability of the utopia of money to the problem of climate change mitigation. Within the utopia of money (aka capitalism), climate change is imagined as the mere result of ‘carbon pollution,’ which is itself the result of the burning of Earth’s fossil-fuel reserves for ‘cheap energy.’ Previous ‘pollution’ phenomena, however, were not of the scope attained by climate change, and thus did not appear in the ‘apocalyptic’ dimension cited by Swingedouw. The carbon pollution of the world’s atmosphere is not, for instance, like polluting Lake Erie or fouling the air around Beijing with coal dust. It’s clearly something of a dimension profoundly beyond what has so far counted as ‘pollution’ – which also explains why no global fossil-fuel ‘cease and desist’ has ever been issued. Since climate change appears as an imagined future apocalypse, as something outside the logic of the utopia of money, its eventual physical manifestations, and their connection to today’s burning of fossil fuels, are ignored in analyses of environmental accounting.

On the other hand, utopian dreaming, and its critical component, utopian studies, will be meaningful in helping people to conceptualize a society in which physical climate change mitigation is possible. Ultimately, the sort of utopian dream which will be useful in imagining climate change mitigation will be a dream of libertarian ecosocialism – see e.g. Joel Kovel’s (2007) masterpiece *The Enemy of Nature*, with its concept of ‘ecocentric production’ (234–241). Such labels, however, are usefully indistinct – the real-life society capable of climate change mitigation will have to be an invention of its participants.

7. Conclusion: Practical Climate Change Mitigation in Utopian Relief

If one is to look at climate change mitigation as a purely physical task requiring a purely physical solution, some minimum requirements of climate change mitigation become clear:

a) *At some point fossil fuel extraction will have to be prohibited altogether.* Selective ‘emissions regulation’ (while allowing the extraction industries to continue) will not accomplish climate change mitigation. This is the primary flaw of the carbon accounting approach, that selective ‘emissions regulation’ is the best it can do. Emissions which are curbed at one area of planet Earth will pop up elsewhere, as the global capitalist demand for fossil-fueled economic growth is potentially boundless. There will have to be at some point (presumably after sufficient resources have been applied to technological conversion to ‘alternative energies’) a ‘keep the grease in the ground’ strategy.

b) *A large portion of the Earth’s carbon reserves which have not yet been produced must stay in the ground indefinitely.* In practical social terms this means

going after the producers of carbon before said reserves are produced. Bill McKibben made this clear in a 2012 piece in *Rolling Stone* magazine when he said:

‘If you told Exxon or Lukoil that, in order to avoid wrecking the climate, they couldn’t pump out their reserves, the value of their companies would plummet. John Fullerton, a former managing director at JP Morgan who now runs the Capital Institute, calculates that at today’s market value, those 2,795 gigatons of carbon emissions are worth about \$27 trillion. Which is to say, if you paid attention to the scientists and kept 80 percent of it underground, you’d be writing off \$20 trillion in assets. The numbers aren’t exact, of course, but that carbon bubble makes the housing bubble look small by comparison. It won’t necessarily burst – we might well burn all that carbon, in which case investors will do fine. But if we do, the planet will crater. You can have a healthy fossil-fuel balance sheet, or a relatively healthy planet – but now that we know the numbers, it looks like you can’t have both.’

Let’s be clear here. ‘Saving the climate’ means the eventual abandonment of an entire industry.

c) *World-society must receive both a technical and a social makeover.* Estimating the scope of these makeovers can be said to run into difficulties both economic and political. The scope of the technical makeover will vary depending upon whether one asks the nice people selling the technical equipment, or if one asks their critics. Estimates of what it would cost to ‘solarize’ world-society, for instance, will be low if one asks a solar power sales representative, or high if one asks a critic. Costs, of course, are a function of a utopia of money in which paying costs is imagined to solve all problems; getting away from the commodity obsession with ‘value’ toward an analysis of total ‘worth’ will reveal that saving civilization from the longer-term effects of climate change will in all instances be ‘worth it.’

A technical makeover may also involve some form or other of geoengineering. What form this geoengineering will take, whether it be through iron fertilization of the oceans or through a space sunshade, will no doubt be related to the specific effects of climate change at any particular moment in history.

A social makeover will be necessary simply because capitalist society keeps ‘upping the ante’ with each technical innovation. John Bellamy Foster, Brett Clark, and Richard York have covered this in a number of publications for Monthly Review Press, the most recent of which is a 2010 piece in the *Monthly Review* magazine titled ‘Capitalism and the Curse of Energy Efficiency: The Return of the Jevons Paradox.’ The Jevons Paradox, as applied by these authors, is that increases in energy efficiency paradoxically result in overall increases in the energy diet of the (capitalist) society at large. As of 2014 world oil ‘production’ (actually extraction) was 93.2 million barrels per day, and (if the ratio given in Raupach et al. (2007) still holds) world-society also consumes a roughly equal carbon-equivalent of coal. Meeting these energy figures through ‘alternative energy’

(about which a debate still rages) will be daunting; and (if Foster, Clark, and York are right) such figures will continue to increase with the development of ‘alternative energy.’ The authors suggest that:

‘What is neglected, then, in simplistic notions that increased energy efficiency normally leads to increased energy savings overall, is the reality of the Jevons Paradox relationship – through which energy savings are used to promote new capital formation and the proliferation of commodities, demanding ever greater resources. Rather than an anomaly, the rule that efficiency increases energy and material use is integral to the “regime of capital” itself.’

Thus a departure from the regime of capital accumulation will be necessary to attain climate change mitigation.

d) *The ‘union of free producers’ regime as mentioned in Marx and elsewhere will greatly ease the logistical problem of achieving climate change mitigation from the starting point of present-day world society.* Such a utopia as depicted in volume 1 of *Capital* will serve as a guiding post for a movement to achieve climate change mitigation. Such a movement can start with any sort of humanistic departure from the utopia of money, but must eventually coalesce around an appropriate utopianism. Defining what sort of utopianism will offer an appropriate guide to a society capable of climate change mitigation is beyond the scope of this essay; nonetheless some general parameters can be imagined.

There are potentially vast benefits to reducing the world-system’s total need for energy through dramatic socialist transformation. Victor Wallis’ important essay ‘Ecological Socialism and Human Needs’ (*Capitalism Nature Socialism* 8: 4, December 1997) suggests criteria for an ecological socialist society which might prove useful for a discussion of climate change:

‘Ecological and socialist criteria converge in demanding an end to the wasteful consumption of resources and energy. Among human activities, we may classify as preeminently wasteful those which are undertaken not in response to universal human needs (which involve spiritual or cultural as well as material objectives) but rather in conjunction with institutional imperatives reflecting the power and the interests of a particular class.’
(48)

Replacing capitalist class society with a classless union of free producers, then, would allow world-society to phase out the markets for a vast array of professions (and thus also their maintenance through a hypertrophied fossil-fuel energy economy). Wallis’ laundry-list of unnecessary capitalist services suggests across-the-board elimination of advertising, insurance, accounting, banking, a number of professions related to urban sprawl and economic globalization, industrialized agriculture, much of what counts as spectator sports, and a great number of

hypertrophied military and police ‘services’ (49). Eliminating the ‘markets’ for such services would greatly reduce the world-society’s overall energy needs.

The social model depicted in Anitra Nelson’s ‘Carbon Emissions: Prices and Values’ (*Journal of Australian Political Economy* 66 (2010–2011): 268–285) might provide an appropriate guide to the sort of utopian society that needs to be envisioned if a movement for climate change mitigation is to move forward. Nelson calls this model ‘non-market socialism’ and opines:

‘Under this “compact” model, work would be organized in a direct and collective way. Local plans would centre on collective sufficiency – a broader but similar notion to self-sufficiency – so that people would grow plants, keep animals and engage in appropriate technologies to satisfy their needs as directly as possible. However, these associated producers would exchange with other bioregional communities – using the closest available source – to fulfil needs that they could not meet locally. Innovations such as permaculture, buying local and “food swaps” (Jackson 2010) already demonstrate some of these principles.’ (281)

To summarize my argument here: the task of finding adequate energy sources and of reorganizing energy economies to get physical climate change mitigation is *greatly simplified* if we commit to a global economy which meets human needs *directly* (rather than indirectly, and inadequately, through a global money economy). If ‘emissions’ are locked-in under present-day capitalist infrastructure, then they need to be unlocked, and the most useful lock to pick in that regard is the one binding economic actors to the global money economy. Moreover, freeing the global working class from the necessity of ‘making a buck’ will free up significant populations for the tasks of mitigating, and adapting to, climate change.

e) *A utopian conversation will have to reach a critical mass to make the goals in a) through d) possible.* The goals discussed above, to be sure, are utopian goals – and to make such utopian goals available on a global scale one might envision a change in the global social imaginary. One can imagine this taking place through a movement or a political party or a candidacy – though specification of the exact form taken by a change in the global social imaginary (to create a society which allows for physical climate change mitigation) is beyond the scope of this essay.

REFERENCES

- Aden, Nate (2016). 21 countries are reducing carbon emissions while growing GDP. *World Resources Institute*, 5 April. Accessed online 4/14/2016 at <http://www.wri.org/blog/2016/04/roads-decoupling-21-countries-are-reducing-carbon-emissions-while-growing-gdp>.
- Anderegg, William R. L. et al. (2014). Awareness of both Type 1 and Type 2 errors in climate science and assessment. *Bulletin of the American Meteorological Society*, 95, 1445–1451. Accessed online 9/15/2016 at http://sciencepolicy.colorado.edu/admin/publication_files/2014.34.pdf.

- Berners-Lee, Mike, and Duncan Clark (2013). *The burning question*. Vancouver, BC, and Berkeley, CA: Greystone Books.
- Bloch, Ernst (1959/1986). *The principle of hope: Volume 1* (Trans. Neville Place, Stephen Place, and Paul Knight). Cambridge, MA: MIT Press.
- Boehm, Steffen (2015). The Paris climate talks and other examples of climate fetishism. Steffen Boehm (personal blog). December 4. Accessed 3/17/2016 at <http://steffen-boehm.net/2015/12/04/interview-the-paris-climate-talks-and-other-events-of-carbon-fetishism/>.
- Brenner, Robert (2003). *The boom and the bubble*. New York: Verso.
- Earth System Research Laboratory. Global Greenhouse Gas Reference Network. Accessed 3/17/2016 at <http://www.esrl.noaa.gov/gmd/ccgg/trends/>.
- Energy Information Agency (EIA). *Online energy statistics*. Accessed 4/14/2016 at <https://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=53&aid=1>.
- Foster, John Bellamy (2013). James Hansen and the climate-change exit strategy. *Monthly Review*, 64, 1–19.
- Foster, John Bellamy, Brett Clark, and Richard York (2010). Capitalism and the curse of energy efficiency: The return of the Jevons paradox. *Monthly Review*, 62, 1–12.
- Freire, Paulo (2004). *Pedagogy of indignation*. Boulder, CO: Paradigm Publishers.
- Gibson, Kathleen R. (2005). Epigenesis, brain plasticity, and behavioral versatility: Alternatives to standard evolutionary psychology models. In Susan McKinnon and Sydel Silverman (Eds.), *Complexities: Beyond nature and nurture*. Chicago, IL: University of Chicago Press, 23–42.
- Healy, Stephen (2014). Psychoanalysis and the geography of the anthropocene: Fantasy, oil addiction and the politics of global warming. In Paul Kingsbury and Steve Pile (Eds.), *Psychoanalytic geographies*. Farnham, Surrey: Ashgate, 181–196.
- Incropera, Frank P. (2016). *Climate change: A wicked problem*. New York: Cambridge University Press.
- IPCC Press Release (2014). IPCC: Greenhouse gas emissions accelerate despite reduction efforts. April 13. Accessed 3/17/2016 at https://www.ipcc.ch/pdf/ar5/pr_wg3/20140413_pr_pc_wg3_en.pdf. Web.
- Jackson, Robert B. et al. (2016). Reaching peak emissions. *Nature Climate Change*, 6, 7–10.
- Klein, Naomi (2014). *This changes everything: Capitalism vs. the climate*. New York: Simon and Schuster.
- Kovel, Joel (2007). *The enemy of nature: The end of capitalism or the end of the world?* 2nd edn. New York: Zed.
- Lee, Paul J. et al. (2011). Comparisons between the cap and trade system and carbon taxation: Is the US ready for a carbon tax? In Larry Kreiser et al. (Ed.), *Environmental taxation and climate change: Achieving environmental sustainability through fiscal policy*. Northampton, MA: Edward Elgar, 35–46.
- Lennon, John (1971). Why? Lyrics. Imagine. Sony/ ATV Music Publishing.
- Levitas, Ruth (1990). *The concept of utopia*. New York: Peter Lang.
- Levitas, Ruth (2013). *Utopia as method: The imaginary reconstitution of society*. New York: Palgrave Macmillan.
- Lohmann, Larry (2012). Financialization, commodification, and carbon: The contradictions of neoliberal climate policy. *Socialist Register*, 48, 85–107.
- Lynas, Mark (2008). *Six degrees: Our future on a hotter planet*. New York: National Geographic.
- Klein, Naomi (2014). *This changes everything*. New York: Simon & Schuster.

- Marx, Karl (1932/2009). The power of money. *Economic and philosophic manuscripts of 1844*. (Trans. Martin Mulligan). Accessed 3/17/2016 at <https://www.marxists.org/archive/marx/works/1844/manuscripts/power.htm>.
- Marx, Karl (1867/2015). *Capital*. Vol. 1, Ch. 1. (Trans. Samuel Moore and Edward Aveling). Accessed 3/17/2016 at <https://www.marxists.org/archive/marx/works/1867-c1/ch01.htm>.
- McKibben, Bill (2012). Global warming's terrifying new math. *Rolling Stone*, 19 July. Accessed 3/17/2016 at <http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719>.
- Mooney, Chris (2014). The world's climate change watchdog may be underestimating global warming. *Washington Post*, 30 October. Accessed 3/17/2016 at <https://www.washingtonpost.com/news/wonk/wp/2014/10/30/climate-scientists-arent-too-alarmist-theyre-too-conservative/>.
- Mora, Camilo, et al. (2013). The projected timing of climate departure from recent variability. *Nature*, 502, October 10, 183–187.
- Moreno, Camila, Lili Fuhr, and Daniel Speich Chasse (2016). Beyond Paris: Avoiding the trap of carbon metrics. *OpenDemocracy*, 8 February. Accessed 3/17/2016 at <https://www.opendemocracy.net/transformation/camila-moreno-lili-fuhr-daniel-speich-chasse/beyond-paris-avoiding-trap-of-carbon-metr>.
- Nelson, Anitra (2010/2011). Carbon emissions: Prices and values. *Journal of Australian Political Economy*, 66, 268–285.
- Norman, Wayne, and Chris MacDonald (2003). Getting to the bottom of 'Triple Bottom Line'. *Business Ethics Quarterly*, 17, 1–19.
- Peebles, Graham (2014). Worldwide inequality. *OpenDemocracy*. 29 January. Accessed 3/17/2016 at <https://www.opendemocracy.net/graham-peebles/worldwide-inequality>.
- Raupach, Michael R. et al. (2007). Global and regional drivers of accelerating CO2 emissions. *Publication of the National Academy of Sciences*, 104, 10288–10293. Accessed 4/14/2016 at <http://www.pnas.org/content/104/24/10288.full.pdf>.
- Roberts, Peter, and John Freeman-Mohr (2013). *Better worlds: Education, art, and utopia*. Lanham, MD: Lexington Books.
- Robinson, William I. (2014). *Global capitalism and the crisis of humanity*. New York: Cambridge University Press.
- Ross, Sean (n.d.). What is the difference between asset price inflation and economic growth? Investopedia. Accessed 4/14/2016 at <http://www.investopedia.com/ask/answers/032715/what-difference-between-assetprice-inflation-and-economic-growth.asp>.
- Swingedouw, Erik (2010). Apocalypse forever? Post-political populism and the spectre of climate change. *Theory, Culture, and Society*, 27, 213–232.
- The Real News (2016). Can GDP growth and carbon emissions be delinked? Online video clip. YouTube. 8 April. Accessed 4/14/2016 at <https://www.youtube.com/watch?v=qF6NxLkKCYk>.
- United Nations Environment Programme (UNEP). Climate change mitigation. Accessed 3/17/2016 at <http://www.unep.org/climatechange/mitigation/>.
- Wallis, Victor (1997). Ecological socialism and human needs. *Capitalism Nature Socialism*, 8, 47–51.
- Weart, Spencer (2008). *The discovery of global warming*. Cambridge, MA: Harvard University Press.

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.