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TOWARDS A POST-CARBON SOCIETY: CLIMATE CAPITALISM OR ECOLOGICAL SOCIALISM?

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RESUMEN

A pesar de la abrumadora evidencia científica de que nos enfrentamos a un futuro devastador si no reducimos las emisiones de gases de efecto invernadero rápidamente, parecemos incapaces de romper con nuestro modelo económico y social basado en el carbono. Este artículo emplea un enfoque de economía política para examinar el modelo dominante de hoy. A partir de la obra de Karl Polanyi, se sitúa la crisis ambiental en el contexto más amplio de una crisis del capitalismo. Se interroga acerca del potencial de un capitalismo climático para lograr una sociedad baja en carbono y sostiene que el reto del decrecimiento requiere que nos movamos hacia un socialismo ecológico.

PALABRAS CLAVE:

Crisis medioambiental, economía política, decrecimiento, capitalismo climático, socialismo ecológico

'Production, consumption patterns and lifestyles in all of the three key transformation fields [energy, urbanisation, and land use] must be changed in such a way that global greenhouse gas emissions are reduced to an absolute minimum over the coming decades, and low-carbon societies can develop. The extent of the transformation ahead of us can barely be overestimated. In terms of profound impact, it is comparable to the two fundamental transformations in the world's history: the Neolithic Revolution, i.e., the invention and spreading of farming and animal husbandry, and the Industrial Revolution, which Karl Polanyi (1944) called the "Great Transformation", meaning the transition from agricultural to industrialised society.'

German Advisory Council on Global Change (WBGU) (2011: 5).

This opening quote from the high-level German Advisory Council that reports directly to the German Chancellor reminds us of the enormous transition that faces human society if it is to move to a low-carbon or post-carbon society.[1] For, as the UNDP's 2011 *Human Development Report* puts it, 'our development model is bumping up against concrete limits' (UNDP, 2011: 15). Yet, while growing scientific evidence shows how our patterns of development are environmentally unsustainable, most recently highlighted in the Fifth Assessment report of the Intergovernmental Panel on Climate Change (IPCC, 2013), dominant policy paradigms in countries around the world are based upon a return to economic growth within a neo-liberal consumption-driven economy. The stark contradiction between what scientific evidence is telling us needs to be done and what is actually happening was highlighted by some scientific reaction to the publication of the IPCC report. As Prof. Kevin Anderson of the University of Manchester in the UK put it to the BBC: 'Governments, businesses and high-emitting individuals around the world now face a stark choice: to reduce emissions in line with the clear message of the IPCC report, or continue with their carbon-profligate behaviour at the expense of both climate-vulnerable communities and future generations' (BBC News, 2013).

This stark choice confronts humanity with what is perhaps the greatest dilemma it has ever faced in its history: can we try to mobilise our resources in the most unprecedented ways over a short time span of no more than half a century to avoid the worst of the devastating scenarios outlined in the IPCC report or do we continue to give priority to economic growth and its principal mechanism, the extension of a consumer society throughout the world, seeking at best to modify or 'green' it? At its heart, this is a dilemma about the contradictions between what our science is telling us and what our deeply entrenched belief systems are telling us about how we organise our economy and society, about what constitutes the good life. Our future rests on which of these we choose to follow, the evidence or our beliefs? Yet, few see the challenge in these terms. Many believe that science and technology will save us, finding ways that will permit us maintain our current consumer lifestyles while simultaneously reducing our greenhouse gas emissions by up to 95% by 2050 and replacing our dependence on fossil fuels by renewable sources of energy. The opening quote above from the German Chancellor's expert group draws our attention instead to the fundamental changes required to the ways we organise our economy and society. But the debate on climate change has focused much less on these issues, what we can call our models of development. The purpose of this article is to use the analytical categories of political economy to elucidate the options facing us.

The next section introduces the conceptual categories and discusses what they can offer, making clear the distinction with political ecology. The examples of Iceland and Chile are briefly discussed to illustrate the utility of a political economy approach. The following section places the environmental challenges into the wider context of the crisis of capitalism, through the thought of Karl Polanyi. This focuses attention on the key role of the market in the generation of the current crisis and opens a discussion in the subsequent section about the need to move beyond a climate capitalism, introducing the concept of an ecological socialism and some of its constitutive features, drawing particularly on traditions of utopian socialism and radical democracy. The final brief section draws conclusions.

1 Throughout this article, the term 'low- and post-carbon society' is used. The reason for this is not to hedge bets about the extent to which it is possible to decarbonise. Rather, the term is used to combine the two senses of the objective being sought: the term low-carbon society is the scientific term for the fact that we must move to a society that emits low levels of carbon and other GHGs. Science tells us that we cannot hope to eliminate all emissions as a certain level occurs naturally. However, the term post-carbon society is added to express that what we are moving towards is a new type of economy and society in which the issue of carbon and other GHG emissions no longer is a cause for concern; to that extent it will be very different from the carbon-based economic model that began with the Industrial Revolution in Britain in the late eighteenth century and has now been globalised.

Political economy

In essence, political economy focuses attention on the interrelationship between political and economic power, the state and the market. While in the 19th century the field encompassed the study of the broad processes of social change undertaken by Smith, Ricardo, Mill and Marx, by the early 20th century with the emergence of the distinct disciplines of economics and political science, the field of political economy became more restricted to studying the interaction of state and market. Three broad approaches can be distinguished mirroring the broad theoretical traditions of the western social sciences: a statist approach which prioritises the role of the state in governing or guiding the market; a liberal approach which examines how institutions can enhance the competitive operation of the market; and a critical or radical tradition which focuses on questions of economic, gender or environmental equity. While political economy limited itself to the national sphere over much of the 20th century, the field has become strongly internationalised over recent decades, mirroring the internationalisation (some would say globalisation) of economic and political relations since the 1970s (O'Brien and Williams, 2010; Ravenhill, 2011). The focus on the organised power of civil society in some branches of the social sciences over recent decades has enriched the field by introducing a focus on agency and resistance, examining how these can modify the ways in which state and market power interact (Gill, 2003; Castells, 1997).

A recent application of these categories to the task of transforming capitalism comes in the work of US sociologist, Erik Olin Wright. His project of on transforming capitalism through real utopias offers a framework for different configurations of capitalist and socialist empowerment based upon the interrelationships of state, economic and social power (Wright, 2013). Thus, where economic power predominates, one has a configuration of capitalist empowerment, and where state power predominates one has a configuration of authoritarian statism. However, the more interesting configurations involve different balances of the three forms of power constituting, for example, a social democratic statist regulation (state power governs the market but is held in check by social power), a capitalist statist regulation (economic power dominates state power with social power being very weak) or a social democratic associational democracy (social power is predominant). While these are ideal types, they offer practical guidance as to how different political economy configurations (different models of development as they are often called) can and do emerge. Among the predominant examples today are the neo-liberal models of Anglo-American capitalism (including such models as the Chilean and the Irish models), the developmental statist models of East Asia, the statist models of China and Vietnam and the social democratic Nordic models. One might argue that in Latin America today a new model is beginning to emerge in those countries ruled by 'new left' governments, what Wylde calls a neo-developmentalist regime (Wylde, 2012).

These approaches to examining power configurations have largely been missing from those forms of social and political thought that seek to include environmental issues as essential components, what is often called Green political and social theory. As outlined by Barry, this has concentrated on a number of themes, namely overcoming the separation of 'human' from 'nature, viewing humans as a species with specific characteristics and needs, examining how the relationship with the environment is both constitutive of human society but also lays down limits to its development, and giving moral value to forms of life beyond the human species (Barry, 2007: 295-98). A particular debate concerns whether Green political thought marks a new ideology overcoming the traditional Right-Left division (Dobson, 2007) or is better seen as a variety of political positions, mirroring the main Right-Left positions, but emphasising the importance of environmental concerns within these. As such, it has been criticised for an overconcentration on these concerns at the expense of such issues as equity, efficiency or democracy (Connolly and Smith, 1999: 62). Where political economy issues emerge is in the eco-socialist debates about the compatibility of Marxist and ecological thought, though these

have remained peripheral within Green social and political thought.

Where political economy issues have been usefully integrated into environmental thinking is in the academic discipline of political ecology which focuses on asymmetries of power in the ways in which the social and the natural relate and constitute one another. However, as the field has developed it has broadened to encompass a wide range of concerns, from degradation of ecosystems, through a focus on local, indigenous knowledge, to the politics of social action about the environment (Adams, 2009: 196-99). While this field has added to understandings of how power helps constitute both environmental outcomes and the ways we think about the environment, it has been less successful in developing political economy approaches to theorising the transition to a low or post-carbon society. While political ecology seeks to be transdisciplinary and to integrate the social and the natural sciences, it is less successful in addressing some of the other key challenges to Green social and political theory as identified by Barry. These are the need for a future-oriented intergenerational focus, moving beyond national boundaries to an explicitly global, transnational focus, and the urgency of linking theory to practice in order to impact on what is happening in the world. Adopting a more explicit international political economy (IPE) focus offers the possibility addressing these challenges (Barry, 2007: 300-13) though IPE itself needs to be challenged to integrate environmental issues and limits more centrally within its theoretical toolkit (Kirby, 2013).

One of the dominant figures in today's IPE, Robert W. Cox distinguishes the approach of political economy from that of 'problem-solving' theory embodied in disciplines such as economics and political science:

> Political science and economics are actor-oriented studies. They take off from some rather fixed assumptions about the framework or parameters within which action takes place –the institutional framework of politics, or the concept of the market. Within these parameters, they can often give quite precise answers to specific questions. . . .
>
> Political economy, by contrast, is concerned with the historically constituted frameworks or structures within with political and economic activity takes place. It stands back from the apparent fixity of the present to ask how the existing structures came into being and how they may be changing, or how they may be induced to change. In this sense, political economy is critical theory (Cox, 1995: 32).

Cox makes clear that environmental destruction is a central aspect of the challenge of global change in today's world. This includes not only the 'trade-off between environment and development' which is central to dominant theories and practices of international development but also 'the relationship of human organization to nature'. 'The relatively affluent are challenged to rethink their patterns of consumption and behaviour, in relation to the biosphere and to the models they project to less affluent peoples' (ibid. 42, 42). Taking a political economy approach to the challenges of transitioning to a low or post-carbon society therefore places the limits posed by the biosphere to our dominant models of development within a wider critique of these models, refusing to treat the environmental challenges apart from the social and economic challenges. A brief look at the challenges posed by climate change to Iceland and Chile helps illustrate the analytical value of such an approach (see Boxes 1 and 2). A theoretical framework which helps integrate the environmental with the social and economic is offered by the work of Karl Polanyi.

Polanyi's 'fictitious commodities'

Polanyi helps to overcome some major difficulties that Marx's thought has posed for the attempt to draw on the socialist tradition to address the challenge of transitioning to a low or post-carbon society. These difficulties centre on what is seen as Marx's Promethean view of the human person's domination of nature as well as his valuing of human labour rather than nature as the key source of value. The dismal record of communist governments towards the environment enhances the skepticism of some environmentalists towards Marxism. While defenders of Marx are able to draw on quotes that

show Marx's appreciation that the human person is part of nature and that the environment poses limits to capital accumulation (Foster, 2010), the attempt to integrate environmental concerns within Marxism founders on the differences between the early and more humanist Marx and the later and more scientific thinker he became (Connolly and Smith, 1999: 50). Drawing on the work of Polanyi, however, offers a more coherent way of integrating environmental concerns within a critique of industrial society.

A major motivation of Polanyi's work was to contest the claim by Adam Smith that economic activity derives from some natural tendency to 'barter, truck and exchange one thing for another' on which he based the view that markets had always played a central role in the ways societies provisioned themselves. Polanyi saw this as a dangerous 'misreading of the past' since it was only with the British industrial revolution that an industrial system was put in place 'which, practically and theoretically, implied that the human race was swayed in all its economic activities, if not also in its political, intellectual, and spiritual pursuits, by that one particular propensity' (Polanyi, 2001: 46). Thus, for Polanyi, the central revolutionary innovation of the industrial revolution was the emergence of a 'self-regulating system of markets'. As he wrote, 'the most startling peculiarity of the system lies in the fact that, once it is established, it must be allowed to function without outside interference' (ibid. 44). This system is based on the three 'fictitious commodities' –the commodification of land, labour and money. In identifying precise commodities that are offered for sale through market mechanisms within industrial capitalism, Polanyi was pointing to the wider and essential dimensions of society that each of these represents, each of which accurately describes the source and origin of the fundamental crises of contemporary capitalism.

The commodification of land stands for the commodification of the whole of nature and the natural world, a process that has extended in our day to an extent that would have been impossible for Polanyi to imagine (the 'water wars' that have broken out in some parts of the world being a good illustration). The commodification of labour stands for the commodification of the human person (note that markets exist in some parts of the world for living body parts while the trafficking of women and children for the commercial sex trade is seen as a form of modern slavery). And the commodification of money identifies how a medium of exchange becomes a commodity to be bought and sold in its own right; this has now reached the extremes of the complex financial instruments of today's hyper-financialised capitalism. As Polanyi saw so presciently in his classic work *The Great Transformation*, allowing these fictitious commodities through the market mechanism 'to be the sole director of the fate of human beings and their natural environment indeed, even of the amount and use of purchasing power, would result in the demolition of society' (Polanyi, 2001: 76).

Polanyi's three fictitious commodities accurately identify the three core elements that make today's capitalism so unsustainable, showing how the environmental crisis stands alongside other core crises of the system. The commodification of labour lies at the heart of the crisis of the social reproduction of capitalism as the gap between higher earners, average earners and lower earners has grown exponentially, while security of employment has virtually disappeared in many sectors of the global economy. This has resulted in the growing depression of the purchasing power of the income of large sectors of the population even in countries at the core of the capitalist system, and has been a major contributing factor to the high levels of personal debt built up as people seek to participate as active consumers in a society where participation is more and more defined by the ability to engage in practices of consumption rather than through an active practice of citizenship. The commodification of money lies at the heart of the transformation of the financial system of today's capitalism into an almost entirely speculative system that has become to a great extent disengaged from the productive economy. It was this speculative financial system that lay at the heart of the economic collapse of 2008-9. Following that collapse, many citizens of our societies have experienced 'the demolition of

society' which was what Polanyi predicted would be the result of allowing society be organised through the mechanisms of these fictitious commodities.

The damage results from the disembedding of the economy from society so that society ends up serving the needs of the market which 'required that the individual respect economic law even if it happened to destroy him' (Polanyi, 2001: 89). The key impact on human wellbeing therefore lies not primarily in reduced income but, rather, in 'the lethal injury to the institutions in which his [the human person's] social existence is embodied' including a stable and sustaining relationship to the ecosystem: 'The result is loss of self-respect and standards, whether the unit is a people or a class, whether the process springs from so-called culture conflict or from a change in the position of a class within the confines of a society' (ibid.: 164-5). This approach focusingon the relationship between the economy on the one hand, and society and the ecosystem on the other, provides the basis for identifying the fundamental problems to be addressed, problems that lie at the heart of the model of an industrial economy and society the foundations of which were laid at the time of the industrial revolution. For the central mechanism that has driven the development of industrial capitalism has been the self-regulating market which Polanyi's own work showed to be an innovation of the industrial revolution and not to have existed in societies around the world before the mid-eighteenth century (Dalton, 1968; Pearson, 1977). The big question to be faced, therefore, is whether we can move to a low or post-carbon society without also moving beyond this innovation which underpinned the emergence of industrial society.

Towards an ecological socialism

Using a political economy lens allows us identify the mixes of state, market and society that underpin approaches to transitioning to a low or post-carbon society. As Strachan and Foxon put it in discussing options for low-carbon energy futures, these can be based on Market Rules, on Central Co-ordination or on Thousand Flowers; each of these offer very different transition pathways (Strachan and Foxon, 2012: 86-88). What applies to low-carbon energy applies more widely to a low-carbon society and economy: will it be built on the rules of the market, on the central co-ordination of the state or on the creative endeavours of the countless groups and individuals engaged in a myriad of different forms of civil society activism?

It is not surprising that, within the hyperfinancialised form of neoliberalism that has dominated the global political economy for the past two decades, the dominant attempts to reduce carbon emissions have entailed using the rules of the market to create incentives for producers and consumers to move to activities that emit less carbon. This has been described as climate capitalism, 'a model which squares capitalism's need for continual economic growth with substantial shifts away from carbon-based industrial development' (Newell and Paterson, 2010: 1). Essentially, this entails creating different types of carbon markets which put a price on carbon, such as emissions trading like the EU's Emissions Trading Scheme (ETS) and the Clean Development Mechanism (CDM) which allows investment in developing countries to offset carbon emissions, as well as expanding markets for renewable energy technologies which offer opportunities for investors (see Newell and Paterson, 2010 for a comprehensive discussion). The emergence of these market-based mechanisms has helped shift the view of some sectors of business and finance from seeing climate change as a threat to seeing it as an opportunity to be embraced. For example, one can today visit the permanent Crystal exhibition in London's docklands dedicated to showing how urban living can become low-carbon and sustainable. Not only is this housed in a sustainable building which itself is part of the demonstration of what can be done with cutting-edge technologies but it has been entirely developed by a private company Siemens as a showcase for its technological innovation. There is evidence therefore that some of the innovative financial and technological potentials of capitalism are being harnessed to help society make the transition to a low or post-carbon society. And this has been achieved not just through the endeavours of

market actors such as corporations and pensions funds but has also involved governments which have created many of the rules and incentives for these activities, and civil society actors such as NGOs which benefit from investments through the CDM.

However, many questions remain about just how far climate capitalism can take us towards a low- or post-carbon society. Newell and Paterson raise questions about the extent of the benefits it is delivering, highlighting difficulties of methodology in assessing these benefits (such as accounting, measurement and regulation problems) and weak governance of these markets (targets that are not robust enough and rules that are too loose). Based on their analysis of the development of climate capitalism up to now, they outline four possible future scenarios: a climate capitalist utopia where all the mechanisms work to achieve the goal of a low and post-carbon society; stagnation where markets falter and fail to achieve their potential; a 'decarbonised dystopia' which manages to achieve the objective sought but in a highly inegalitarian manner benefiting the privileged and placing the burden of adjustment on the poor and vulnerable, and climate Keynesianism where much stronger governance ensures markets act to achieve the objective sought. All are plausible, they write, but add: 'In all likelihood some messy mix of them all will co-exist – some areas of the world stagnating, others going ahead with a pure neoliberal version, while others still regulate the carbon economy more stringently' (Newell and Paterson, 2010: 178).

As they themselves recognise, what Newell and Paterson's scenarios point to is the need for politics. This is how society can influence which scenario emerges. However, while they rightly identify problems with climate capitalism, they tend to emphasise the more technical or managerial problems while acknowledging but offering little discussion of what seem the principal political challenges. These can be identified as growth, equity and motivation. Each is treated in turn here and their implications for political economy models drawn out.

- *Growth:* The economy that emerged from the industrial revolution was premised on limitless growth. Despite some very far-seeing advice from John Stuart Mill in *Principles of Political Economy* published in 1848 both that 'the increase of wealth is not boundless' and that 'the stationary state of capital and wealth' would be far preferable, with attention devoted to greater distribution and to 'moral and social progress' (Mill, 1970: 111, 113, 116), belief in economic growth has become deeply embedded in modern society. Such publications as the Club of Rome's report on the limits to growth in 1972 which sounded an early warning about the environmental limits to growth failed to dent this almost religious belief. Today's environmental crisis, however, is raising in an ever more urgent way the necessity for recognising these limits and finding practical ways of living within them. The fundamental question has been posed by Jackson: 'How –and for how long– is continued growth possible without coming up against the ecological limits of a finite planet?' (Jackson, 2009: 6). There are both practical and theoretical answers to this question. The first relates to how far we can decouple growth from GHG emissions and on this the evidence points to the possibility of relative decoupling (fewer carbon emissions are emitted for each unit of GDP growth) but not absolute decoupling (there is no absolute cut in emissions) (Urban and Nordensvärd, 2013: 12-15). This points to the need to limit growth if we are to limit emissions in an absolute way. The second answer relates to the deeper theoretical and philosophical question of finding a balance between the demands of human production and consumption and the carrying capacity of the biosphere on which all our activities depends (Heinberg, 2011). The practical implications of this second question for the ways we organise our economy and society are being debated within the degrowth literature (Latouche, 2009). Since all the capitalist economies we know are premised upon growth, we do not know if degrowth is possible within capitalism.

- *Equity:* Polanyi recognised that one characteristic of the industrial revolution in Britain was 'the incomprehensible fact that poverty seemed to go with plenty' (Polanyi, 2001: 89). In our day the inequalities created by industrial society have reached grotesque proportions as the gap between the salaries of high-earning executives and of factory workers in the United States has grown from 24:1 in 1965, to 71:1 in 1989, to 262:1 in 2005 and up to 325:1 in 2011 (Felber, 2012). Only those societies that have curbed the free operation of market forces (socialist and social democratic societies) have succeeded in creating greater equality. Inequality is driven by the free-market system. For the transition to a low or post-carbon society, the distributional issue is central as the transition must be managed in such a way as to ensure a far more just and equitable distribution of the costs and benefits than occurs under today's capitalist model. Newell and Paterson's scenario of a 'decarbonised dystopia' recognises this challenge.
- *Motivation:* What drives growth and innovation under capitalism is the profit motive. Yet, as Wright has recognised, 'only by curtailing profit-maximisation as the driving force allocating capital would it be possible to reengineer the economy in the rich regions of the world in such a way that increases in leisure would be given priority over increases in consumption and most people would be able to acquire an adequate standard of living without continual economic growth in material production' (Wright, 2013: 8). This quote establishes the conditions for global equality within a degrowth economy and finds them incompatible with the profit motive. He concludes: 'All of this is inconsistent with capitalism' (ibid.).

The essential task in moving decisively and quickly from the very weak form of sustainability that has been achieved so far within the free market capitalist model towards the transformed society and economy that are required for a post-carbon future requires extensive social and political mobilisation. Newell and Paterson conclude their study of climate capitalism by stating that 'struggles around how markets work and how they should be governed (and for whom) provide the basis to improve upon them or to construct new markets or other forms of policy intervention' (Newell and Paterson, 2010: 188). However, as Adaman et al. conclude in examining how to re-embed the economy in society and nature, capitalist solutions 'seek to complete the institution of the very process of commodification and marketisation which led to his critique of the self-regulating market and the disembedded economy in the first place' (Adaman et al., 2007: 101). The crucial issue therefore is how far do struggles have to go: can market power be so curbed and governed to achieve a low or post-carbon society that the resultant model is still a form of capitalism or has moved beyond to a form of socialism in which the good of society has replaced the profit motive? The central insights of Polanyi point decisively to the core of the problem lying in the fiction of treating land, labour and money as commodities. As his daughter, Kari Polanyi Levitt has more recently summarised the implications of her father's thought:

> If we cannot set limits to the reach of the market, economic forces will destroy the capacity of society to resist disintegration and the capacity of the biosphere to renew itself. Public ownership and social and economic planning must be rescued from their current status as heresies. The vision of socialism as a co-operative, democratic and just economic order based on the social ownership and control of natural and man-made resources, united by the enjoyment of a community of culture, embodies the best of the legacy of the European enlightenment (Polanyi Levitt, 2013: 53).

This therefore points the way to an 'ecological socialism' in which markets can again be embedded in society rather than dominating it and in which social power is strong enough to curb the dominance of both market and state power. It is, as Cock puts it, 'a new kind of socialism which is democratic, ethical and ecological' (Cock, 2011: 240).

Defining the model that is needed to make the transition to a low or post-carbon society as socialist opens the richness of socialist thought as a resource to be drawn upon, particularly the utopian socialist tradition which for well over a century has been eclipsed by so-called scientific socialism. However, key themes of the utopian socialist tradition such as democratic control, workers' control of the workplace, co-operative forms of organising production and distribution, and the localisation of production and distribution all resonate with the requirements of a post-carbon world. Furthermore, in the work of Felber, for example, we can see the elaboration of how such an economy might operate. He emphasises the importance of democratic deliberation in shaping the direction of the economy. We need to rediscover a sense that the people are sovereign, he writes, meaning that their decisions override all others. This could be given effect through a democratic convention to decide on the values and goals of the economy, ensuring they accord with the values of the country's Constitution (which, in many cases, allows the common good override the right to private property). Within large corporations, Felber argues that decision making should be shared not only with their workers but also with the wider society through involving representatives of consumers, of women and of the environment. He argues that the principle of separation of powers in the democratic political system needs to be translated to the economic system whereby power should not be concentrated to the point where it threatens the freedom of all. Without the pressure to compete aggressively, the need for economic growth which dominates our current economic system would greatly lessen, he writes. The urge for limitless growth would be replaced by the desire to reach the optimum size to fulfil social and ecological goals without overshooting the carrying capacity of the ecosystem. The current system based on aggressive competition which seeks to damage competitor companies will be replaced by collaboration and the common good (Felber, 2012).

Furthermore Felber's ideas would result in the decommodification of labour, land and money. In terms of labour, he argues that democratic deliberation should set what differential between the highest and the lowest incomes is acceptable to society and that this should be ratified by all electors. Democratic deliberation should also put limits to how much private property any one person can own. Workers should share in profits by receiving percentages fixed by democratic deliberation. These would be key means to address the current crisis in the social reproduction of the capitalist economy, particularly the growing gap between the top and the bottom of the income scale. On land, Felber argues that no one should be allowed own nature as private property and that municipal government should have the responsibility of sharing land for productive uses and for housing. There should be strict limits on the amounts of land given to any one person, either for agricultural use or for housing. This would help people to see nature as a common good to be guarded and protected by all, he argues. On money, he proposes a financial system totally different from the one we have today with democratic and co-operative banks serving the common good rather than profit. Banks should give particular priority to stimulating regional economies and making investments that are sustainable from a social and an ecological point of view. Private banks will only exist as non-profit co-operatives or community banks. In these ways, the financial system will be structured in such a way that it serves the long-term good of society and the ecosystem.

Conclusions

The transition to a low or post-carbon society will require wrenching transformations of our economy, society, political systems and culture, akin to the transition from feudalism to capitalism according to the German Advisory Council whose quote opens this article. Yet, despite the overwhelming scientific evidence of science that we face devastating and unforeseeable futures, our political and economic leaders as well as the publics in our societies seem unable to break with our carbon-based economic and social model. This article has argued that what is required to break the stranglehold of ideology on the options facing us is to adopt the

conceptual toolkit of political economy which can fill a gap in 'green' thinking as to the power configurations that might better serve the transition to a low or post-carbon society. The essential features of such a political economy approach were outlined and their utility illustrated through introducing the cases of Iceland and Chile. The insights of one innovative and influential thinker, Karl Polanyi, were introduced to place the role that the self-governing market has come to play in today's global political economy in an historical context, seeing it as an innovation of the industrial revolution. His analysis of the three 'fictitious commodities' of land, labour and money helped situate the environmental crisis as one dimension of a wider crisis of capitalism involving social and financial dimensions also. This opened a discussion of the political economy model most suited to make the transition to a low or post-carbon society which argued that climate capitalism fails adequately to address essential challenges related to growth and equity, largely due to the centrality of the profit motive. An alternative model, labelled ecological socialism was then introduced and some of its features illustrated through the thought of Christian Felber based on the radical decommodification of land, labour and money within a deliberative democratic society. In this way, the article sought to elaborate an ideology that can respond to what science is demanding of society.

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BOX 1: ICELAND: OPTINGFOR HIGH-CARBON DEVELOPMENT

Iceland is one of the few countries in the world for which climate change should offer a major competitive advantage. This is due to the fact that it generates all its energy needs from sources that emit low levels of greenhouse gases as 73% of its electricity is produced by hydropower stations and 27% by geothermal vapour. Its ability to supply large amounts of energy cheaply and its lack of connections to the electricity grid overseas has already given it an advantage in attracting aluminium companies to set up in the country and around 80% of the energy produced by domestic sources is sold to heavy industry, mostly aluminium smelters. However, despite having a low carbon footprint from its energy sector, overall GHG emissions in Iceland rose by 35% between 1990 and 2009, with the largest part coming from the ferrous alloys industry and from aluminium smelting. The reliance of transport and of the fishing fleet on fossil fuels accounts for much of the remainder of Iceland's large carbon footprint of around 14.3 tons per person in 2010 (Institute for Sustainability Studies, 2012).

Since 2007, Iceland has been committed to a reduction of 50-75% in the net emissions of greenhouse gases by 2050 using 1990 levels as a baseline. While the severe economic crash that hit in 2008 helped reduce demand in the economy and thereby reduce carbon emissions, with recovery since 2012 the country's per capita carbon footprint has been rising again. However, it is on target to meet its commitments under the Kyoto Protocol and is putting in place ambitious plans both to reduce emissions and to increase its potential for carbon sequestration. Its 10-point plan, agreed in 2010 and revised in 2012, includes commitments to carbon tax on fuel, to linking road tax to emissions, to environmentally friendly fuels, and to extending public transport and promoting cycling. These measures are already helping reduce emissions in the transport sector. Iceland intends to achieve half of its carbon reduction through sequestration and has ambitious targets to extent forestation and restore land. It has taken an international lead on the issue of restoring to wetlands areas that have been drained since there has been a growing recognition that drainage releases carbon while wetlands sequester it. Partly due to Iceland's diplomatic efforts, the issue was agreed at the 2011 Durban conference as part of international accounting for land management under the UNFCCC process.

Yet, for all its successes, there is a fundamental contradiction at the heart of the Icelandic model of development, highlighted in the book *Dreamland: A Self-Help Manual for a Frightened Nation*, published in Icelandic in 2006 (English translation, 2008) which went on to be a major best seller. Written by essayist and writer Andri Snær Magnason, this highlights the nation's love affair with aluminium smelters despite the destruction being wrought to the country's pristine beauty. The country already has three aluminium smelters and there are plans at different stages of development to build four more, among them some of the largest in the world. These were shelved due to unfavourable alumina prices and also due to a lack of political enthusiasm when the Social Democrats and the Left Green party were in power from 2009 to 2013. But with the right wing coalition re-elected in 2013, the expectation is that the political atmosphere will be more favourable for expanding the aluminium sector. Not only will this worsen Iceland's GHG emissions but government officials admit that any substantial reduction awaits technological solutions that may be found in the future. Though it has signed up to the extension of the Kyoto Protocol, Iceland has gained an exemption for emissions from aluminium smelters and other heavy industry which are expected to increase by between 115% and 261% by 2020 (Fontaine, 2012). As Magnason writes: 'The intention seems to be to turn the land our children will inherit into one of the biggest aluminium smelting nations on earth, without any clear idea of what we are letting ourselves in for' (Magnason, 2008: 183).

Box 2: Chile: Legacies of dictatorship

In 1970s and 1980s hydropower dominated Chilean electricity generation, providing 80 per cent of capacity with negligible GHG emissions. Yet, between 1990 and 2006 overall emissions grew by 232 per cent, most especially from the energy sector which accounted for 57.8 million tons of GHG emissions in 2006 out of a total of 78.9 million tons, 19.3 million tons of which was sequestered through land-use and forestry. Furthermore, predictions contained in Chile's 2011 report to the UNFCCC show that emissions are expected to rise from transport and the copper mining industry, in the latter case largely due to the use of energy generated by fossil fuels. No projections are given for reducing emissions from the energy sector (Ministerio de Medio Ambiente, 2011). What happened to change a benign trajectory of emissions into the high-growth trajectory into which Chile now seems locked?

The answer lies in the extreme free-market model of development put in place by the military dictatorship (1973-90) which remains largely in place to the present day. The liberalisation and subsequent privatisation of both water and the electricity market began in 1981. This transferred water rights to private owners and 'sharply reduced the government's role and authority in water resources management, regulation, and development' (Bauer, 2009: 598) instead 'concentrating power in the hands of relatively few owners who have enjoyed significant monopoly powers' (ibid. 601) which they used to speculate in water. Only in 2005 was this law changed but the reform was 'decidedly modest' and barely touched 'the core principles of private property rights, market forces, and a weak state' (ibid. 604). The liberalisation of the electricity market and the privatisation of generation 'allowed large private electricity companies to appear that wielded great economic power in an otherwise weak regulatory and policy context' (Mundaca, 2013: 241-2). In time, this lead to a major increase in the import of oil products and coal to fill gaps in generation capacity with the result that CO2 emissions increased. Installed coal-based capacity increased at a far faster rate than renewable energy capacity and is expected to reach 26 per cent by 2020 compared to 17 per cent in 2005 since 'market price mechanisms were the sole explicit instrument used to foster energy efficiency improvements during the period under analysis' (Mundaca, 2013: 243).

As Mundaca concludes: 'One explanation for the lack of policy instruments – and consequently investment – to support energy efficiency and renewable energy is the lack of regulatory power of the Chilean government' (ibid. 243). The prevailing influence of the private sector and a free-market ideology 'means that the administration has very limited discretion in directing prices and investments in order to positively affect energy efficiency or renewable energy technology investment.' 'Furthermore, monopoly power and speculation in the water permit market has delayed or stopped hydropower investment projects' (ibid. 244).