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DISRUPTIVE SOCIAL INNOVATION FOR A LOW-CARBON WORLD

Evaluating prospects for a Great Transition

We think we can see something new emerging. We are standing in the dark shade of a threshold and trying to see and understand that which is opening in front of us. We do not understand it very well, but we can hear fragments of new melodies of struggle emerging, see glimpses of a new direction in the flow of revolt.

– John Holloway

1. Introduction

It is becoming increasingly clear that small, incremental changes to the way humans use and produce energy are unlikely to catalyse a transformation to a low-carbon civilisation, at least, not within the ever-tightening time frame urged by the world's climate scientists. In September 2013, the IPCC published its fifth report, in which it was estimated that the world's 'carbon budget' – that is, the maximum carbon emissions available if the world is to have a good chance of keeping global warming below 2° – is likely to be entirely used up within two or three decades, based on current trends (IPCC, 2013). If 'business as usual' continues, the trends indicate that we may be facing a future that is 4° hotter, or more (see World Bank, 2012; Christoff, 2013). It is not clear to what extent civilisation is compatible with such a climate.

This calls for an urgent and committed re-evaluation of dominant strategies for transitioning beyond fossil fuels. If there is any hope for rapid decarbonisation today, it surely lies, at this late stage, in movements, innovations, or technologies that do not seek to produce change through a smooth series of increments, but

through an ability to somehow ‘disrupt’ the status quo and fundamentally redirect the world’s trajectory toward a low-carbon, post-growth future.

The phrase ‘disruptive innovation’ will be used in this chapter to refer to rapid and far-reaching societal change that is provoked by the abrupt emergence of a social movement, technology, business model, or confluence of such phenomena. This usage draws loosely on the work of Clayton Christensen (1995), who coined the term ‘disruptive innovation’ to describe times when commercial enterprises develop new business models or technologies that rapidly change the market in ways that are both unexpected and game-changing. In Christensen’s work, a disruptive innovation is contrasted with a ‘sustaining innovation’, which is less about changing the game and more about competing more effectively in the same game.

While there may be a certain irony to using terminology from commercial discourse to refer to socio-technical innovations that could potentially shake the very energy basis of the global economy, the language of ‘disruptive innovation’ aptly describes the extent and speed at which any transition to a low-carbon world must proceed. With the carbon budget shrinking as business as usual persists – to say nothing of the myriad other ecological crises worsening by the day – a progression of ‘sustaining innovations’ seems unlikely to affect the changes necessary. The task is too urgent; the extent of change needed, too great.

As implied above, disruptive innovations can take place within various spheres of life: social, economic, technological, institutional, and political. In order to transition to a low-carbon world, it is likely that a coordinated confluence of innovations from all such spheres will be required to produce deep behavioural, systemic, and structural change (see generally, SPREAD, 2011). This chapter focuses on the *socio-cultural* sphere. Without denying the importance of other spheres of transformative change, there are reasons to think the socio-cultural sphere may be of particular importance in driving the transition to a low-carbon world.

The socio-cultural domain may have special disruptive potential due to the fact that other spheres of innovation can be understood as *tools* or *means*, whereas the socio-cultural sphere can be understood to be the source of *goals* or *ends*. This difference is important because until there is a culture shaped by the values and vision of a low-carbon world, available tools or means for societal change (e.g., legislation, technology, capital, etc.) are likely to be misdirected, and perhaps even be employed in counter-productive ways. In much the same way as the tool of ‘fire’ can have a positive or negative impact on our lives, depending on how it is used and

how much of it there is, the tools of technology, business, and politics can advance or inhibit the transition to a low-carbon society, depending on the social values and desires that shape their implementation and development. For these reasons, the socio-cultural sphere can be considered fundamental, in the sense that it provides the *ends* towards which available *means* are directed.

This point deserves some elaboration. The nature and development of technology in a society, for example, will take different forms depending on the social context and the dominant social values which drive innovation. If the primary *end* of ‘research and development’ is profit-maximisation, not necessarily the desire for a low-carbon world, it follows that technological innovations are just as likely to inhibit, rather than facilitate, a low-carbon transition (e.g., fracking technologies). A similar dynamic exists with respect to business and politics. Until there is a socio-cultural context that *incentivises* or *demand*s economic or political change in the direction of a low-carbon world, the tools of business and public policy are unlikely to be sources of ‘disruptive innovation’, but at most sources of ‘sustaining innovation’. More likely still, they will merely serve to reify and entrench the status quo.

Another way to think about the importance of the socio-cultural sphere is in terms of sequencing; that is, in terms of in what order various innovations may need to take place on the path to a low-carbon world. By the time business, politics, and technology are capable of ‘disrupting’ the status quo, it may be that a revolution in social values would need to have already taken place, in order to have driven such innovation in the first place and been receptive to it. After all, it is no good establishing an innovative bike-sharing business if few people are interested in cycling; just as an effective carbon policy will not be the foundation of a successful political campaign until the social conditions are ripe for its acceptance. Again, this is not meant to downplay the undeniable importance of technological, economic, and political innovations on the path to a low-carbon society. A coordinated, multi-faceted approach is both necessary and desirable. But insofar as technology, business, and politics are a reflection of the culture in which they are situated, it would seem that disruptive innovation in the socio-cultural sphere may need to be the prime mover, so to speak, which would then enable or ignite further disruptive innovations in other spheres of life.

Significantly, the socio-cultural sphere is also the domain where individuals have most agency. We may not feel like we have much influence over the decisions of our members of parliament, or the decisions of big business or other global institutions, but within the structural constraints of any society there nevertheless resides a

realm of freedom through which individuals and communities can resist and oppose the existing order and make their influence felt (Gibson-Graham, 2006; Holloway, 2010). However small those acts of opposition (or renewal) might seem in isolation, when they form part of a large social movement, their cumulative impact can reshape society ‘from below’ and ultimately form a tidal wave of revolutionary significance, washing away the old world, or aspects of it, and clearing space for the new. A brief glance at the history of social movements shows this to be true.

Of course, to suggest that technology, business, and politics are merely a reflection of culture is a contestable and, in many ways, an overly simplistic proposition. Public policy, for example, rather than always being shaped by culture in a uni-directional way, sometimes takes the *lead* in societal development and is influenced by forces *other* than culture. The same can be said of the spheres of business and technology, both of which *shape* culture as they are *shaped by* culture, in a dialectical fashion. Nevertheless, it would be fair to state that any transformative politics, technology, or business model needs to be complemented, and probably preceded by, a co-relative transformation in the socio-cultural sphere. This suggests that we must carefully consider not only what cultural or social conditions would best facilitate the realisation of a low-carbon world, but also what role social or cultural movements might have to play in producing those conditions.

The purpose of this chapter, then, is to review contenders, so to speak, for the category of most innovative social movements working toward a low-carbon world, movements which are potentially ‘disruptive’ in the sense outlined above. Admittedly, it is a difficult challenge indeed attempting to choose movements or innovations with genuinely disruptive potential. An element of arbitrariness is inevitable, especially since there is no ‘criteria’ as such by which they can be objectively ranked (see Science Communication Unit, 2014). Furthermore, the ‘tipping points’ of influential social movements in history have generally come as a surprise to the societies that they came to influence, due to the impossibility of anticipating the confluence of events and social conditions which were needed for them to flourish. Who anticipated the civil rights activist, Rosa Parks? Who could have foreseen that a simple act, such as not giving up one’s seat on the bus, would give such momentum to the Civil Rights Movement? This calls for a healthy dose of humility in undertaking the current task.

It follows that different people would surely make different choices and see different degrees of potential in today’s various social movements for a low-carbon world. Be that as it may, the movements reviewed below did seem to jump out somewhat as

obvious contenders, not only for what they already are, but more importantly, what they are promising, or even threatening, to become (see also, Seyfang and Haxeltine, 2012; SPREAD, 2011; Seyfang *et al.*, 2010). It is an impossible calculation to know which of these are most likely to explode into the mainstream and ‘change the world’. Perhaps none of them will; perhaps they may all play a part; or perhaps the change will be ignited by something else entirely. Fortunately, this very uncertainty comes with a silver lining – namely, that hope for a low-carbon world partly resides in the fact that the movement or movements that could spark the Great Transition beyond fossil fuels may, as yet, lie unimagined, or simply be dormant, awaiting ignition. For better or worse, a ‘black swan’ may lie around every bend in the river (Taleb, 2007).

As the philosopher Ludwig Wittgenstein once remarked about attempts to foresee the future (see Rorty, 1979, *xii*):

When we think about the future of the world, we always have in mind its being at the place where it would be if it continued to move as we see it moving now. We do not realize that it moves not in a straight line, but in a curve, and that its direction constantly changes.

Bearing this message of caution and hope in mind, the following review will consider those social movements or social innovations that at least have the potential to change the current trajectory of history acutely in the direction of a low-carbon world.

2. Potential Contenders for Disruptive Social Innovation

2.1. The fossil fuel ‘divestment’ campaign

The analysis will begin with the fossil fuel ‘divestment’ campaign, which was initiated late in 2012 by climate activist, Bill McKibben, and his networking team at 350.org. In the 18 months since then this campaign has taken on a life of its own, as nascent social movements tend to do. The disruptive potential of this campaign lies in how directly it challenges the *financial foundations* of the fossil fuel industry, without which the industry could not support itself or develop new projects. Find a way to remove the financial lifeblood of the industry – that is, find a way to remove or minimise shareholder investment in fossil fuels – and the industry would inevitably wither away by the very same logic of capital that currently sustains it.

Motivated by this possibility, McKibben and his team organised a campaign for fossil fuel ‘divestment’, which calls on individuals, communities, institutions, and governments to withdraw or ‘divest’ their financial support from the fossil fuel industry with the ultimate aim of crippling it (see McKibben, 2012). Without investment, the fossil fuel industry cannot exist; without the fossil fuel industry, the primary cause of climate change is eliminated. The genius of this campaign lies both in its simplicity and its directness, and the movement seems to be growing in momentum.

In the US, 380 college campuses have committed to divestment (Conifeno, 2013), with successful divestment having already been achieved in nine universities and colleges, 22 cities, and 10 religious organisations, with further campaigns under way in Canada, the UK, Sweden, Finland, India, Bangladesh, as well as Australia and New Zealand (see Go Fossil Free, 2014a). While the campaign encourages individuals to divest wherever possible, the main focus is on larger institutions and organisations where the real financial power lies, especially banks, super schemes, universities, churches, and governments. A recent report from Oxford University concludes that this is the fastest growing divestment campaign in history (Ansar *et al.*, 2013).

Significantly, the transformative potential of divestment as a strategy for deep societal change is not without precedent. As the fossil fuel divestment website notes (Go Fossil Free, 2014b):

There have been a handful of successful divestment campaigns in recent history, including Darfur, Tobacco and others, but the largest and most impactful one came to a head around the issue of South African Apartheid. By the mid-1980s, 155 campuses—including some of the most famous in the country—had divested from companies doing business in South Africa. 26 state governments, 22 counties, and 90 cities, including some of the nation’s biggest, took their money from multinationals that did business in the country. The South African divestment campaign helped break the back of the Apartheid government, and usher in an era of democracy and equality.

One of the most interesting and promising elements to the fossil fuel divestment campaign is how it mixes financial self-interest with environmental and humanitarian ethics. The ethical side of the divestment campaign is obvious enough: fossil fuel emissions are the primary cause of climate change (IPCC, 2013), thus a moral case can easily be made that people and institutions should not be investing in, or profiting from, an industry that is in the process of destabilising the climate with potentially devastating social and environmental consequences (World Bank, 2012; Cristoff, 2013).

Just as it would be unethical to profit from the slave trade or from the sale of ivory, it is ethically dubious to profit from the cause of climate change. This argument is perhaps particularly relevant to universities, for there is a glaring moral and intellectual contradiction in funding the salaries of climate scientists with profits that flow, in part, from investments in the fossil fuel industry. Accordingly, divestment from the industry would seem to be a moral and intellectual imperative.

This ethical defence is arguably grounds enough for divesting from fossil fuels, but the fascinating thing about the ‘divestment’ campaign is how it frames a supplementary argument based on self-interest. Perhaps this is where the real revolutionary potential of the campaign lies. McKibben argues that people or institutions concerned about *their own financial assets* should immediately divest from fossil fuels because there is a ‘carbon bubble’ waiting to burst.

The ‘carbon bubble’ hypothesis is based on the notion of a ‘carbon budget’ (Carbon Tracker Initiative, 2011; IPCC, 2013), which represents the estimated amount of carbon emissions the atmosphere could safely absorb (where ‘safely’ means keeping temperatures under 2° from pre-industrial levels, which is the target internationally agreed to in the Copenhagen Accord of 2009). Put simply, McKibben and others argue that the ‘carbon bubble’ exists because the amount of fossil fuels already discovered far exceeds the world’s carbon budget. More precisely, it is estimated that embedded carbon in existing global fossil fuel reserves lies in the vicinity of 2795Gt, but the world’s carbon budget is only around 565Gt (Carbon Tracker Initiative, 2011). What this means is that, if the world is to stop temperatures rising above the threshold of 2°, around 80% of the fossil fuels already discovered simply cannot be burned and must remain in the ground.

A carbon bubble exists, therefore, because currently fossil fuel shares are priced on the assumption that *all reserves* will be produced. It follows that any serious response to climate change is going to burst the carbon bubble by turning a vast amount of fossil fuel reserves into ‘stranded assets’ of little or no value. The underlying threat of this approach arises out of the understanding that markets are notoriously whimsical, in the sense that they sometimes crash not because they necessarily have a reason to crash, but because a certain amount of people *think* that they might crash, leading to divestment. When a few sheep bolt, the rest tend to follow, if only because a few have bolted. Aware of this tendency, McKibben’s divestment campaign is trying to shatter investor confidence in the fossil fuel industry and spark the initial capital flight, in the hope of opening the floodgates.

The divestment campaign is calling on people to recognise both the ethics and the economics of this situation, and withdraw their shares in the fossil fuel industry before the bubble bursts and the value of their shares implode. Not only do investors have a financial self-interest to do so, a broad-based divestment from fossil fuels could crash the industry by destroying its investment base, which, as noted, is a leading aim of the campaign.

Even if the campaign does not manage to bankrupt the industry economically, the campaign may nevertheless advance a critically important goal of ‘stigmatising’ the fossil fuel industry as a primary enemy of climate stabilisation, thereby bankrupting it politically and socially. Historically, stigmatisation has been an important function of divestment campaigns (see Ansar *et al.*, 2013).

While it could be argued that the ‘divestment’ campaign puts too much faith in market mechanisms as a means of responding to climate change, this potential indictment can easily be reconceived as a defence of the strategy: divestment uses the existing mechanisms of capitalism to undermine what is arguably capitalism’s defining industry. If ever there was an “Achilles’ Heel” to the fossil fuel industry, the divestment campaign just might be it.

Of course, it is not enough merely to ‘divest’ from the fossil fuel industry; it is equally important to ‘reinvest’ in a clean energy economy. This additional reinvestment strategy provides further grounds for thinking that the divestment campaign could be of transformative significance in bringing about a post-carbon or low-carbon world.

2.2. *Transition initiatives*

If the fossil fuel divestment campaign is one of the most promising social movements *opposing* and *undermining* the carbon-based society, the Transition Towns Movement is arguably one of the most promising and coherent social movements focused on *building the alternative* society (see Hopkins, 2008; Seyfang, 2009). This movement burst onto the scene in Ireland in 2005, and already there are more than 1000 Transition Towns around the world, in more than 40 countries. Given that this movement is explicitly seeking to mobilise communities for a low-carbon future, it is important to consider what exactly defines a Transition Town and evaluate the extent to which this movement has ‘disruptive’ potential.

The fundamental aims of the movement are to respond to the twin challenges of peak oil and climate change by decarbonising and relocalising the economy through a community-led model of change

based on permaculture principles (Hopkins, 2008; Holmgren, 2002). In doing so, the movement runs counter to the dominant narrative of globalisation, and instead offers a positive, highly localised vision of a low-carbon future, as well as an evolving roadmap for getting there through grassroots activism. While this young and promising movement is not without its critics (e.g., James, 2010) there are some, such as Ted Trainer (2009: 11), who argue that if civilisation is to make it into the next half of the century in any desirable form, ‘it will be via some kind of Transition Towns process’.

According to the movement’s co-founder, Rob Hopkins, the strategy and vision of Transition is based on four key assumptions (Hopkins, 2008: 134):

- (1) That life with dramatically lower energy consumption is inevitable, and that it’s better to plan for it than to be taken by surprise;
- (2) That our settlements and communities presently lack the resilience to enable them to weather the severe energy [and economic] shocks that will accompany peak oil [and climate change];
- (3) That we have to act collectively, and we have to act now;
- (4) That by unleashing the collective genius of those around us to creatively and proactively design our energy descent, we can build ways of living that are more connected, more enriching, and that recognise the biological limits of our planet.

The rationale for engaging in grassroots activity is that ‘if we wait for governments, it’ll be too little, too late. If we act as individuals, it’ll be too little. But if we act as communities, it might just be enough, just in time’ (Hopkins, 2013: 45). According to some commentators (Barry and Quilley, 2008: 2), this approach represents a ‘pragmatic turn’ insofar as it focuses on *doing* sustainability here and now. In other words, it is a form of ‘DIY politics’ (Barry and Quilley, 2009: 3), one that does not involve waiting for governments to provide solutions, but rather depends upon an actively engaged citizenry (Seyfang and Haxiltine, 2012; Seyfang *et al.*, 2010).

This approach is particularly relevant here in Australia, where the government is showing no signs of progressing the nation toward a low-carbon future, meaning that any movement toward such a future may have to be driven ‘from below’. Therein lies the promise and coherency of the Transition Towns Movement: in an era of political paralysis, it seems that the *only* path beyond fossil fuels is one led by communities acting locally, and in that regard the

Transition Towns Movement is leading the way. Of course, whether grassroots movements for a low-carbon world ultimately march under the banner of ‘transition’ is of little importance; what is necessary and important is that people do not wait for governments to act or lead the way.

The paradigm shift of Transition is articulated around notions of ‘decarbonisation’ and ‘relocalisation’ of the economy. What this means in practice is complex, but the overarching idea is that decarbonisation is necessary and desirable for reasons of peak oil and climate change, and given how carbon-intensive global trade is, decarbonisation implies relocalising economic processes. As well as this, another central goal of the movement is to build community ‘resilience’, a term which can be broadly defined as the capacity of a community to withstand shocks and the ability to adapt after disturbances (Hopkins, 2008: Ch. 3; Barry, 2012).

Notably, crisis in the current system is presented not as a cause for despair but as a transformational opportunity, a change for the better that should be embraced rather than feared (Hopkins, 2011: 45). Consequently, the vision presented by the Transition Towns Movement is very positive, one that is ‘full of hope’ (Bunting, 2009: np) for a more ‘nourishing and abundant future’ (Hopkins, 2008: 5). Hopkins, who is by far the most prominent spokesperson for the movement, plays a crucial role in promoting such an optimistic message, while at the same time acknowledging the extent of the global problems and asserting that there is no guarantee of success (Hopkins, 2011: 17). By doing so, Hopkins skilfully walks a delicate line: he openly acknowledges the magnitude of the global predicament, but quickly proceeds to focus on positive, local responses and action. Whether his positivity is justifiable is an open question – some argue that it is not (Smith and Positano, 2010) – but it is nevertheless proving to be a means of inspiring and mobilising communities in ways that ‘doomsayers’ are unlikely to ever realise.

As promising as the Transition Towns Movement may be, there are crucial questions it needs to confront and reflect on if it wants to fully realise its potential for deep societal transformation. Firstly, some critics argue that the movement suffers, just as the broader environmental movement arguably suffers, from the inability to expand much beyond the usual middle-class, generally well-educated participants, who have the time, security, and privilege to engage in social and environmental activism. While the Transition Towns Movement is ostensibly ‘inclusive’, this self-image requires examination in order to assess whether it is as inclusive and as diverse as it claims to be, and what this might mean for the movement’s prospects. Can it ‘scale up’ sufficiently? Secondly, there

is the issue of whether a grassroots, community-led movement can change the macroeconomic and political structures of global capitalism ‘from below’ through re-localisation strategies, or whether the movement may need to engage in more conventional top-down political activity if it is to have any chance of achieving its ambitious goals (see, e.g., Sarkar, 1999). Other critics argue that the movement is insufficiently radical in its vision (Trainer, 2010). Does the movement need to engage more critically with the broader paradigm of capitalism, its growth imperative, and social norms and values that constrict the imagination? Is building local resilience within the existing system an adequate strategy? And does the movement recognise that decarbonisation almost certainly means giving up many aspects of affluent, consumer lifestyles? This is not the forum to offer answers to these probing questions (see Alloun and Alexander, 2014; Seyfang *et al.*, 2010; Seyfang, 2009), but engaging critically with these issues could advance the debate around a movement that may indeed hold some of the keys to transitioning to a just and sustainable, low-carbon world.

It may be that the practical reality of the Transition Towns Movement has been ‘over-hyped’ to some extent, but what seems clear is that a low-carbon world will never emerge unless there is an engaged citizenry that speaks up and gets active. Currently, the Transition Towns Movement is the most promising example of such a social movement, mobilising communities for a world beyond fossil fuels, and meeting with some real, albeit limited, success.

2.3. Collaborative consumption and the sharing economy

The term ‘collaborative consumption’ has emerged as one of the socio-economic buzzwords of recent times, with *Time* magazine (Walsh, 2011) listing it as one of the big ideas that will change the world. Surprisingly, perhaps, collaborative consumption is in many ways just a fancy name for ‘sharing’, although as the prime website dedicated to this concept notes, it is ‘sharing reinvented through technology’ (Collaborative Consumption, 2014). But if human beings have been sharing their wealth, possessions, and skills (to varying extents) throughout history, what role could collaborative consumption play in the transition to a low-carbon world? And to what extent could something as mundane-sounding as ‘sharing’ have disruptive potential?

While the term was coined decades ago (see Felson and Spaeth, 1978), collaborative consumption only began entering the popular lexicon over the last few years, primarily through the work of Rachel Botsman and Roo Rogers (2011: *xv*), who define this emerging

practice as: ‘Traditional sharing, bartering, lending, trading, renting, gifting, and swapping, redefined through technology and peer communities’. The innovation here is that people are using online forums and technologies to offer or acquire access to things without necessarily buying or selling them; instead, they often share, hire, or gift them in more or less informal ways – facilitated by online peer communities which make it easy to list or search for available goods and services. In economic parlance, the ‘transaction costs’ of sharing or trading are markedly reduced through the use of the internet, making it more efficient than ever to connect formal or informal sharers and traders.

Examples of collaborative consumption are many, varied, and expanding. A representative example is the upsurge in car-sharing businesses, which involve either a central business purchasing limited cars that are then used by a community of people (e.g., Zipcar, Flexicar, and GoGet), or alternatively, the central business can facilitate peer-to-peer car sharing (e.g., Car-Next-Door). The genius here was in recognising that many, if not most, cars sit idle for a huge portion of the day or week, opening up space to utilise them more efficiently through sharing access. If a person can easily hire a neighbour’s car for an hour or two when needed, this means less need for a personal car. For the same reason, bike hire has also taken off in various cities around the world, often facilitated by local or national governments. Organisations like ‘Lyft’ facilitate ride-sharing, which portends a behavioral shift of paramount importance.

There is also a variety of websites that facilitate sharing with or without monetary exchanges, such as the Sharetribe, Streetbank, or Open Shed, which also function to make better use of existing resources. For example, if there are easy ways to facilitate sharing online, not everyone on the street needs a lawnmower or a jigsaw (since they tend to sit idle), thereby minimising the need for superfluous production and consumption. Other websites, such as Freecycle, rather than facilitating sharing or trading, simply facilitate the gifting of unwanted or superfluous things, thereby reducing the flow of waste to landfill. One of the real success stories of collaborative consumption has been Air BnB, which allows people to list a room or rooms in their home as short or long term accommodation for travellers, providing people with an alternative to hotels and backpacker accommodation.

What these examples show is that collaborative consumption is often more about *access* to goods and services than *ownership*. Botsman and Rogers argue that this ‘new’ form of consumption behaviour and entrepreneurship has the ability to radically transform business, cultures of consumption, and the environ-

mental movement, with potentially deep implications on various aspects of life (Botsman and Rogers, 2011). This transformative potential remains even when the exchange of money is involved, as is the case with prominent websites such as Craigslist, Ebay, and Gumtree. These types of websites still provide an efficient means of allocating or reallocating goods and services beneath the surface of the traditional economy, even if these forms of exchange cannot be called ‘sharing’. If a household finds itself with a surplus couch, table, or set of curtains, there are now numerous channels that are available to connect such goods with people who need them, through the click of a button. This highlights the point that collaborative consumption falls on a spectrum, with some practices taking the form of non-monetary ‘sharing’ or ‘gift’, and other forms sitting closer to conventional economic activity.

There are three broad categories of collaborative consumption: Product Service Systems, Redistribution Markets, and Collaborative Lifestyles (Botsman and Rogers, 2011):

- *Product Service Systems* refer to the switch from an ownership model of consumption toward a usage or access model (see Tischner, Ryan, and Vezzoli, 2009). Thus, people pay for, or get the benefit of a product, without owning it.¹
- *Redistribution Markets* facilitate the redistribution of goods from where they are not needed to any place or person where they are needed. These markets have always existed, but current technologies, especially online social networks, are fuelling this type of collaborative consumption (Glind, 2013). These markets can either involve gifting, sharing, bartering, or more conventional trading, and they are challenging traditional business and consumption methods. According to Botsman and Rogers (2011) ‘redistribution is the fifth ‘R’ - reduce, recycle, reuse, repair and redistribute’.²
- *Collaborative Lifestyles* are less about sharing tangible assets, and more about sharing things like time, space, and skills – again, facilitated by online forums.

¹ Note that not all product service systems should be considered collaborative consumption, because that would include the entire service economy. Instead, collaborative consumption in this context refers to the innovation of bringing *new* services into his category (e.g., car sharing or borrowing a neighbour’s drill) through the use of technology, thus facilitating the sharing of resources that would otherwise have required individual ownership.

² Ibid. 73.

It is difficult to deny the potential of these types of collaborative exchange to challenge dominant cultures of wasteful and excessive consumption. Especially in affluent societies, where a vast amount of goods lie idle and unused, there seems to be huge potential for *avoiding further production of goods* by facilitating the *efficient reallocation of existing goods* through sharing, barter, and trade. Sharing and redistribution via these methods clearly provide a path to reduced carbon emissions, by minimising the need for continuous production, and they seem to have the added benefit of promoting community interaction at the nexus of social and economic life. Of course, there is the further incentive of self-interest: many people are drawn to collaborative consumption for the obvious reason that it can save money and hassle, or even make money.

Nevertheless, this potentially disruptive innovation has various risks that ought to be borne in mind too. For example, one of the obvious benefits for individuals who consume collaboratively is reduced costs; with less need to purchase a commodity, money is saved by hiring or borrowing only when needed. But this gives rise to a risk of a ‘rebound effect’ (see Herring and Sorrell, 2009). That is, if sharing saves an individual money, arguably that provides the person with increased funds to purchase *other* things, potentially negating the environmental benefits of collaborative consumption. Similarly, by providing cheaper access to goods and services, collaborative consumption could actually increase consumption. For example, the cheap accommodation provided through Air BnB could make carbon-intensive travel more financially affordable, again negating the potential environmental benefits of sharing. What this suggests is that, if collaborative consumption is to help catalyse the transition to a low-carbon world, these new mechanisms of exchange must be accompanied by an ethics of sufficiency (Princen, 2005), which is to say, an ethics that consciously uses collaborative consumption as a means of reducing the impact of one’s consumption, rather than as a means of maximising consumption. Otherwise, collaborative consumption could just as easily promote rather than undermine consumerist cultures.

2.4. Innovative approaches to renewable energy: Transcending political paralysis

As the climate situation worsens, a louder chorus is forming amongst scientists, educators, and activists that an urgent top-down political response is needed to facilitate a rapid transition away from fossil fuels toward an economy based on renewables (see Wiseman

et al., 2013). Lester Brown (2011), among others, uses the metaphor of ‘war time mobilisation’ to signify the urgency needed. The US economy changed almost overnight with the bombing of Pearl Harbour in 1942, responding to an urgent security threat by refiguring, among other things, car factories to produce tanks, planes, and ammunition. In much the same way, the shrinking carbon budget suggests that some such mobilisation is needed again, this time to confront the threat of climate change, by mass producing solar panels, wind turbines, and other renewable technologies. Nevertheless, the failures at Copenhagen and later international climate-related conferences do not provide many grounds for hope that politicians are going to be the prime movers in the transition to a low-carbon society.

Fortunately, in recent years there has been a multitude of innovations in the socio-cultural sphere that suggest that, even in the absence of serious top-down political action, the transition to systems of renewable energy supply could be driven ‘from below’. The preeminent example is Germany, which globally produces the most solar energy per capita. The interesting point about the example of Germany is not simply how much it is producing, but that approximately 65% of the renewable energy it produces is *owned by individuals and communities*, as opposed to being funded by the public purse (although attractive subsidies exist). This immediately suggests that there is an available escape from political paralysis, if only individuals and communities are prepared to fund the transition to renewables themselves. Beyond Germany, there are a growing number of inspiring examples – such as the Westmill Cooperative, in the UK, and Hepburn Wind, in Victoria, Australia – where communities, with less attractive subsidies, have still taken the transition to renewables into their own hands.

In order to make such a transition ‘from below’ as easy as possible, creative financing mechanisms and other innovations are being developed which have the potential to better enable individuals and communities to purchase renewable energy, with or without state support. Here are some promising examples:

- *Crowd-funding*: This refers to the collective effort of individuals and communities to pool their resources to support projects they believe in, usually facilitated and campaigned for through the internet. Small contributions from a large number of people are allowing innovators, entrepreneurs and businesses to utilise social networks to raise capital for all types of projects, including renewable energy projects, which do not receive any or sufficient

governmental support. This innovation is putting both power and increased responsibility in the hands of grassroots movements, which now have a means of supporting renewable energy projects, if they are prepared to pay for them. Solar Mosaic, based in California, is one of the most prominent examples, with a similar organisation called Solar Share recently emerging in Canberra, Australia. Interestingly, as well as providing general ethical investment opportunities, these types of organisations also open up space for people to invest in renewable energy who may be unable to do so at the household level (e.g., due to a shaded roof or because they are living in a rental property).

- *Financing mechanisms from suppliers:* There have also been innovations in the way renewable energy can be financed, which is helping people overcome the barrier of upfront payment for renewables. As solar, especially, becomes more financially competitive with fossil energy, it is becoming economically more attractive to invest in solar panels, but some households struggle to afford the upfront cost of purchasing solar panels. That has prompted some energy companies, such as Vector in New Zealand, to offer solar panels to households with a relatively small upfront payment, supplemented by regular monthly payments for a period, rather than expecting a much larger – often prohibitively large – ‘one off’ payment upfront. Similarly, organisations like ‘Every Rooftop’ offer finance to people to lease or buy solar panels with little or no upfront payments. The moment solar becomes obviously cost competitive with traditional (fossil fuel) energy supply, these types of arrangements could facilitate a game-changing transition to renewables by nullifying financial barriers.
- *Environmental upgrade agreements:* These agreements refer to interesting new financing arrangements between private households, banks, and governments, whereby banks offer loans to households to ‘retrofit’ their houses to increase energy efficiency, expand water storage, or purchase solar. Instead of households paying the debt back directly to the bank, however, payments are made via local governments which draw the payments through a rates charge. This means that if the property is sold, the debt stays with the property, providing an incentive to retrofit

one's house, even if one may sell the property in the foreseeable future. There are also means of splitting the repayments with tenants (if they consent, as they may do for self-interested reasons). This is another example of innovative financing mechanism reducing barriers to investments in renewable energy.

- *Social finance and self-managed super*: Other promising developments are taking place in the sphere of 'social' finance; that is, financial institutions that are explicitly motivated by the desire to help fund socially and environmentally beneficial projects. Australian institutions like BankMecu and Foresters are leading the way. There is also a huge sum of superannuation which private citizens around the world could access if they decided to 'self-manage' their own super and use it to invest in renewables.

All of these innovations are taking place in the context of increasing economic (and ecological!) incentives to invest in renewables. Significant advances are taking place, year on year, with respect to the price and efficiency of solar energy, wind energy, and battery storage. We can be sure the moment renewable energy is cheaper than fossil energy, we will see a truly disruptive change in a matter of years, and signs are emerging that such a transformation could be almost upon us, if it is not already (see, e.g., Parkinson, 2014a, 2014b). For example, the former head of the US's largest utility, Duke Energy, says traditional utilities will not change quickly enough in the face of advancements in solar energy, comparing those traditional utilities to frogs in warming water (see Parkinson, 2014c). More interestingly still, Goldman Sachs has recently announced that it is investing US\$40 billion in renewable investments, which it regards as one of the most compelling and attractive markets. Stuart Bernstein, who heads the bank's clean-technology and renewables investment banking group, has recently claimed with respect to the renewable energy market: 'It is a transformational moment in time' (see Parkinson, 2014d).

2.5. *Reconstructing food systems from the ground up*

Transforming energy supply is perhaps the most direct path to a low-carbon world, but reconstructing food systems follows closely in terms of importance. Industrial methods of food production and distribution, and wasteful or high-impact consumption practices, make food a focal point for any transition to a low-carbon world.

Current practices are dominated by the use of carbon-intensive pesticides, fertilisers, oil-powered machinery, and plastic packaging, and the globalised food chain can mean that food often travels tens of thousands of kilometres to arrive on our plates. To make matters worse, it is estimated that, in Australia, more than \$5 billion of food is thrown out every year (Baker, Fear, and Denniss, 2009). The result of all this is that food can be one of the most impactful aspects of modern life, with ecological footprint analyses estimating that food production and consumption accounts for around 28% of our ecological impact here in Victoria, Australia (EPA, 2008).

It follows that any transition to a sustainable society is going to require huge changes in our methods of food production and distribution, and our cultures of food consumption. Not only is food a critically important key to such a transition, it is often said that the way to a person's heart is through their stomach, suggesting that food may be an important way to engage people about broader issues of social and ecological concern. In the absence of progressive government action, however, it again seems likely that the driver for change may have to come from the socio-cultural sphere.

Community gardens are one example of where citizens are getting active in local food production. One must acknowledge, however, that these gardens presently produce only a tiny, often insignificant, percentage of a locality's food production. This is not to downplay the potential importance of community gardens as a mechanism for social change; they are arguably an important means of creating a social conversation about food, as well as creating social hubs and networks that promote community interaction and knowledge sharing. But currently community gardens are not really threatening to disrupt conventional, industrial food production.

Innovations with more disruptive potential involve new ways of connecting local people with local farmers. Food co-ops, local farmers' markets, Community Supported Agriculture (CSA), and farmer-direct veggie box schemes are increasingly providing urban and suburban people with access to locally grown food. Once more, online technologies are making it easier to connect local producers with local markets. One of the most promising innovations in this area is the Open Food Foundation (2014), which offers free software to support local food enterprises. For example, the 'Open Food Hub' software enables people to manage online ordering, multiple suppliers and products, and a range of distribution points; the 'Open Food Network' software is a free open source, scalable e-commerce marketplace and logistics platform that enables communities and producers to connect, trade, and coordinate movement of food. As the website explains, 'it's like a network of online farmers markets that enables everyone to participate.

Through peer-to-peer product traceability and transparency, it helps put control over food into the hands of farmers, eaters and local enterprises.’ Although these types of open source innovations are in their infancy, their potential to empower communities to take control of their systems of food supply (and undermine the power of mega-supermarket chains) is evident. Watch this space.

Online networking groups like The Australian Food Sovereignty Alliance and the Australian City Farms and Community Gardens Network are also providing tools to connect what seems to be a growing movement of people determined to change the way food is produced and distributed in Australia. Similarly, organisations like Second Bite are dedicated to rescuing and reallocating fresh food to people in need across Australia. In 2012, Second Bite rescued 3 million kilograms of fresh food that would otherwise have gone to waste.

‘Localising’ food production, however, is only a relatively small part of the transformation needed. ‘Food miles’ is a concept that gets a significant amount of attention, but analyses suggest that the embedded carbon in the ‘transporting’ of food is only somewhere around 5-10% of the total emissions flowing from food. This is still a significant percentage, of course, and it suggests that localising food production can indeed reduce carbon emissions by reducing food miles (as well as build food resilience and security). But what it really shows is that the *way* food is produced (e.g., industrial vs. organic) and the *type* of foods produced and consumed (e.g., high meat vs. low meat diets), are more relevant to the carbon footprint of food than *where* food is produced (distant vs. local). Furthermore, ‘food miles’ can mislead insofar as different modes of transport change the carbon footprint. For example, transporting food by a truck can be 10 times more carbon intensive than using a train, so again, it is not simply about *where* food is produced, but *how* it is produced, *what* is produced, and *how* it is transported.

What, then, could provoke a radical change away from carbon-intensive methods of food production, distribution, and consumption? Rising energy costs – due to the peaking of oil production or by internalising the full costs of carbon (e.g., a carbon tax) – could be a significant means of changing the economics of the current system. Expensive energy would make organic and local production more economically competitive, and high meat consumption less affordable. In much the same way that we can expect a rapid transition to renewable energy the moment it is cheaper than fossil energy, so too could we expect a rapid transition to organic food production if high energy costs made industrial methods uneconomic. A third mode of transformation could be a culture shift away from high-impact diets, through which people

choose to buy local and organic, and reduce meat consumption, due to *ethical* considerations more than *economic* ones. Ethical enlightenment, however, may not be a pathway to rely upon.

Whether a low-carbon system of food production is forced upon us or voluntarily chosen, the case of Cuba provides an inspiring example of what such a system might look like. With the collapse of the USSR, Cuba's oil imports were reduced significantly, forcing the nation, over a short time frame, to move away from oil-intensive, industrial methods of production to more local and organic systems of food production (see Freidrichs, 2013). In the early 90s, the urban landscape changed drastically, with all available growing spaces cultivated for organic production. Although the Cuban government played a role in this transition, the primary driving force came from people themselves, who just did what they needed to do to survive.

Could more urban centres adopt urban agriculture to the extent Cuba did during its oil crisis? Throughout the developed world and beyond, small but growing subcultures of food activists are experimenting with exciting methods of urban agriculture – food swaps, guerrilla gardening, home aquaponics, vertical gardens, green roofs, 'slow food' practices, community gardens, urban farms, etc. – but as yet, it must be admitted, these practices have been unable to 'scale up' sufficiently to threaten the existing system. But the case of Cuba presents one vision of urban agriculture's potential. It also demonstrates the speed at which food systems can change when ignited by some disruptive force.

2.6. *The Voluntary Simplicity Movement: Reimagining the good life*

Throughout history there have been individuals, communities, and subcultures that have expressed doubts about the ethics, and even the desirability, of materialistic lifestyles and value-orientations (Vanenbroeck, 1991; Kasser, 2002). However, in the present era of chronic environmental degradation, climate change, and burgeoning population, social movements exploring alternatives to Western-style consumer lifestyles are becoming increasingly relevant, insofar as they offer a direct and coherent response to such global problems. If the economy is in ecological overshoot, it follows that the global consumer class must reduce consumption; by doing so the wealthiest segments of the population also leave more resources for those living in destitution (Vale and Vale, 2013). Of course, reducing consumption at the personal or household level is unlikely to be a *sufficient* response to social and ecological

problems, but many argue that a cultural rejection of high-impact consumer lifestyles is a *necessary part* of the transformation needed to achieve a just and sustainable world (Trainer, 2010; Alexander, 2012a; Burch, 2013).

Indeed, climate scientist Kevin Anderson (2012, 2013) has recently been receiving considerable attention for arguing that climate stabilisation requires that most people in the wealthier parts of the world must consume, not just differently and more efficiently; they must actually consume *less*. This is not a strategy or approach that many climate scientists or other sustainability advocates have either recognised or been brave enough to acknowledge publicly, but Anderson does not shy away from the radical implications of the numbers. It is worth unpacking Anderson's forceful emissions-based justification for consuming less, because this is a theoretical innovation with potentially 'disruptive' social and political implications.

Anderson's justification for reducing consumption can be summarised quite briefly. In the Copenhagen Accord of 2009, the international community agreed to take the actions necessary to stop temperatures rising 2° above pre-industrial levels. In order to meet this goal (and keep within the estimated 'carbon budget' that goal implies), Anderson shows that the wealthier nations will need to reduce their emissions by around 8-10% a year, if they are to leave the poorer parts of the world a fair share of the carbon budget (see Anderson, 2013; Anderson and Bows, 2011). The great challenge this presents, however, is that economists claim that emissions reductions above 3% or 4% p.a. are incompatible with economic growth (see, e.g., Stern, 2006). It follows that higher reductions of 8% or 10% p.a. will necessitate giving up economic growth as a national goal and embracing degrowth policies that deliberately initiate a process of 'planned economic contraction' (Alexander, 2012). In terms of lifestyle implications, this evidence-based response to climate change would mean that people in wealthy nations would have to 'cut back very significantly on consumption' (Anderson, 2012: np).

This argument is supported by the fact that it is likely to take much more than a decade to really scale up renewable energy and reduce emissions significantly through *energy supply* transitions (Anderson, 2011). While it is necessary, of course, to transition to renewable energy supply, Anderson (2013) concludes that the only way to reduce emissions sufficiently in the short-to-medium term is to greatly reduce *energy demand* by consuming and producing less goods and services. This is because decoupling of energy and economy is either not occurring, or not occurring fast enough or deeply enough (see Alexander, 2014). Anderson's position goes

directly against other climate and broader environmental analyses, most of which continue to insist that increases in consumption and economic growth in the rich world are compatible with environmental health, climatic stability, and social justice (e.g., Grantham Institute, 2013; UN, 2012).

Against this backdrop, the significance and disruptive potential of the Voluntary Simplicity Movement becomes apparent. This movement can be understood broadly as a diverse and loosely-knit social movement made up of people who are resisting high consumption lifestyles and who are seeking, in various ways, a lower consumption but higher quality of life alternative (Grigsby, 2004; Alexander, 2009). In practice, this way of life might involve growing organic food or supporting local farmers' markets, harvesting rainwater, mending or making clothes, cycling or walking rather than driving, avoiding air flight, limiting work hours, co-housing, purchasing second-hand or 'fair trade', progressively reducing energy consumption, and generally minimising waste and all superfluous purchases. Although participants in this anti-consumerist movement find justification and motivation in a wide range of personal, social, ecological, economic, and even spiritual grounds (Burch, 2013), Anderson's new emissions-based case for consuming less arguably provides the movement with one of its most compelling and urgent justifications.

The largest empirical analysis of the Voluntary Simplicity Movement (Alexander and Ussher, 2012) shows that there could now be as many as 200 million people in the developed regions of the world exploring, to varying degrees, lifestyles of reduced and restrained consumption. This signifies an emerging social movement of potentially transformative significance, especially if it were ever to radicalise and organise itself with political intent. Notably, that same empirical study showed that the movement was developing both a 'group consciousness' and a 'political sensibility', features that are arguably necessary for any social movement to use its collective power in influential ways. As more people are exposed to the type of reasoning unpacked by Kevin Anderson – that is, as more people see that responding to climate change actually requires consuming less – the Voluntary Simplicity Movement could well grow in size and influence, perhaps with surprising speed.

Interestingly, the justification for embracing a lifestyle of voluntary simplicity does not begin and end with ecological or humanitarian arguments. In recent decades there has been a huge amount of literature exploring the relationship between income and subjective wellbeing (see Alexander, 2012b), and the results undermine the culturally entrenched assumption that 'money buys happiness'. Although the empirical debate is not over, the weight of

evidence strongly suggests that money and material wealth is important at low levels of income, but once basic material needs for food, shelter, clothing, etc. have been met, money has fast diminishing marginal returns. In other words, beyond the basic needs threshold, the things that really contribute most to human wellbeing are not monetary or material, but instead things like socialising, creative activity, meaningful work, and other *non-material* sources of meaning and satisfaction. This literature is arguably a ticking time bomb for consumer culture, because if more people came to see that consumerist lifestyles are not a reliable path to a happy and meaningful existence, they would presumably give up the consumerist lifestyle and seek happiness and meaning in realms other than consumption. Although this culture shift might be motivated primarily by self-interest, clearly it would have beneficial social and ecological implications. The point is that a very strong case is developing for people to explore post-consumerist lifestyles of reduced or restrained consumption, suggesting that the conditions for a cultural revolution are ripe.

It is also worth acknowledging a new and controversial analysis presented by David Holmgren (2013), co-originator of the permaculture concept, which provides further grounds for thinking that the Voluntary Simplicity Movement could have disruptive potential. Voluntary simplicity has always been an *implicit* feature of the permaculture worldview, insofar as permaculture is about designing a way of life that minimises waste in order to work with nature rather than against nature (Holmgren, 2002). But Holmgren recently placed voluntary simplicity at the centre of his thinking, and arrived at a theory of change that has received a vast amount of online attention.

Always doubtful of the prospects of convincing politicians to lead the necessary transition to a low-carbon world, Holmgren has grown increasingly sceptical that any mass movement at the social level is going to produce significant change either. Accordingly, his pessimism has driven him to conclude that the best we can hope at this late stage is to deliberately ‘crash’ the existing fossil fuel-based system and build a permaculture alternative as the existing system deteriorates. His provocative theory, to oversimplify, is that if a new, relatively small social movement of anti-consumers were able to radically reduce their consumption, this reduction in demand for commodities could destabilise the global economy, which is already struggling. More precisely, Holmgren hypothesises that if merely 10% of people in a nation could reduce their consumption by 50%, this could signify a 5% reduction in total demand, which, although small, would likely cause havoc with any growth-based economy. It is important to emphasise that Holmgren does not romanticise the

process of collapse; he acknowledges the worrying risks his strategy poses. First and foremost, it is unpredictable in its consequences. Nevertheless, he argues that whatever risks his strategy poses, there are greater risks – both socially and environmentally – in letting the existing system continue to degrade planetary ecosystems. What is most interesting about Holmgren’s strategy is that it does not rely on a mass movement. He believes that a relatively small but radical anti-consumerist movement could be a truly disruptive force.

Whether one agrees with Holmgren’s strategy or not, it provides further grounds for seeing the Voluntary Simplicity Movement as a social movement of potentially transformative significance. If growth-based economies require cultures of insatiable consumers to function, this suggests that such economies could be fundamentally transformed if enough people withdrew their support and instead embraced lifestyles of voluntary simplicity. Furthermore, it should be clear enough that any transition beyond fossil fuels is going to have hugely significant lifestyle implications, and voluntary simplicity – the idea of living more with less – is arguably the most coherent and attractive way of ‘reimagining the good life’ beyond a fossil-fuel-based economy. Indeed, one of the most radical acts of liberation and opposition in a consumer culture is the ‘great refusal’ to consume more than one needs. Admittedly, this is not an organised movement that draws attention to itself, and it is not attached to a ‘buzz word’ that excites much media attention. But it does seem to be bubbling under the surface of the dominant culture of consumption, threatening to expand.

2.7. Redefining ‘progress’ through alternative indicators to GDP

If social movements based on notions of transition, voluntary simplicity, collaborative consumption, permaculture, etc., provide coherent and attractive means of reconceptualising life at the personal, household, and community levels, the emergence of ‘alternative indicators’ to Gross Domestic Product (GDP) present themselves as an important way to reconceptualise the meaning of macroeconomic ‘progress’ on the path to a just and sustainable, low-carbon world. While this subject, at first instance, might seem to be more of an economic innovation than a socio-cultural innovation, the fact that these alternative indicators seem to be receiving increased socio-cultural attention and support is the ‘movement’ which it will be suggested has disruptive potential. As noted in the introduction, economic, political, and technological innovations are unlikely to be disruptive until there is a culture that desires them, or

is at least receptive to them, and there are reasons to think that support for alternative indicators are on the rise. As leading advocates for alternative indicators have recently noted, ‘The chance to dethrone GDP is now in sight’ (Costanza *et al.*, 2014: 283). In this section we explore why this might be significant.

Economic growth is conventionally defined as a rise in GDP. These national accounts first emerged in the 1930s with the onset of the Great Depression, and developed significantly during World War II to assist with planning. But it was really in the post-war era that GDP came to prominence, not only in the US but also increasingly around the world (Collins, 2000). Almost immediately international comparisons of GDP per capita were made as a way of assessing the relative ‘progress’ of nations (Purdey, 2010), and today almost all governments around the world consider growth in GDP to be their overriding objective (Hamilton, 2003). Not only is growth widely considered the best means of keeping unemployment at bay, growth is also considered the best means of providing individuals and governments with more economic power to purchase those things they need or desire most. The underlying assumption is that growth in GDP is always good, such that a bigger economy is always better.

The critical flaw in this macroeconomic paradigm lies in the fact that GDP is by no means a holistic measure of a nation’s ‘progress’, a point made decades ago by pioneering ecological economists Herman Daly and John Cobb (Daly and Cobb, 1989). GDP is merely a measure of the total market activity of a nation over a given period – a measure that makes no distinction between market activity that contributes to wellbeing and activity that does not. For example, GDP treats market expenditure on guns, antidepressants, and cleaning up oil spills no differently from expenditure on education, solar panels, and bicycles. All market activity is considered good. But obviously the *nature* of market activity influences a society’s wellbeing, not just its extent, so GDP is a very crude measurement of progress, at best.

Furthermore, GDP says nothing at all about the level or nature of *non-market* activity in a society, such as community engagement, health, or the functioning of ecosystems; nor does GDP say anything about the distribution of wealth in a society (see also, Stiglitz, Sen, and Fitoussi, 2010). That last point on inequality is important in light of recent evidence showing that economies that have broader distributions of wealth do better on a whole host of social indicators (Wilkinson and Pickett, 2010). For present purposes, however, it is the absence of ecological factors within the GDP accounts that signify their greatest failing. It is no good having a growing, carbon-intensive economy if such growth undermines the ecosystems

(including climate systems) upon which wellbeing fundamentally depends.

What all this means is that GDP should not be used as a proxy for national progress, because it totally overlooks these critically important factors. Indeed, as Robert Kennedy famously noted, GDP measures ‘everything except that which makes life worthwhile’ (as quoted in Costanza, 2014: 283). Furthermore, treating GDP as a proxy for progress obviously encourages governments to shape their policies to maximise GDP, even if that means degrading the environment, destroying communities, and increasing inequalities of wealth. In other words, fetishising GDP can lead nations to seek growth of the economy, even if that would have negative impacts on the overall wellbeing of a nation.

Wanting to provide much more nuanced and comprehensive indicators of the overall progress, Daly and Cobb (1989) pioneered the development of the Index of Sustainable Economic Welfare (ISEW). This index, and others like it – such as the Genuine Progress Indicator (GPI), the Happy Planet Index (HPI), and the Bhutanese notion of Gross National Happiness (GNH) – take into consideration important social and ecological factors that GDP simply does not reflect (e.g., Lawn, 2006; Lawn and Clarke, 2008). For example, the ISEW and GPI begin with total private consumption expenditure and then make deductions for such things as resource depletion, pollution, income inequalities, crime, loss of leisure, ‘defensive expenditures’, etc., and make additions for such things as public infrastructure, volunteering, and domestic work. The aim is to measure, as accurately as possible, the overall wellbeing of a nation, including its sustainability, not just its total market activity.

The results from such indexes tend to show that despite steady growth in GDP over recent decades, the genuine progress of many developed nations has been stagnant or even in decline (Kubiszewski *et al.*, 2013). Put otherwise, the results indicate that growth has stopped contributing to wellbeing in most parts of the developed world and now may even be causing the very problems that growth is supposed to be solving, suggesting that many developed nations have entered a phase of ‘uneconomic growth’ (Daly, 1999). If this is so, it would mean that developed nations should stop treating GDP growth as the primary answer to societal problems and instead develop policies that more directly advance wellbeing. Such policies could include eliminating poverty, broadening the distribution of wealth, and protecting the environment, with GDP growth being a goal of lesser importance.

Importantly, some governments and institutions around the world are beginning to take these alternative indicators very

seriously, led by the Bhutanese government, which has been shaping policy based on notions of Gross Domestic Happiness since 1972. During his presidency of France, Nicholas Sarkozy commissioned three prominent economists – Amartya Sen, Joseph Stiglitz, and Jean-Paul Fitoussi – to examine alternatives to GDP measures; the commission concluded that GDP was grossly inadequate as a measure of progress and that alternatives were necessary. In the past three years the US states of Vermont and Maryland have adopted the GPI as a measure of progress, and have implemented policies specifically aimed at improving it (see Costanza *et al.*, 2014). Even David Cameron has stated: ‘It’s time we admitted that there’s more to life than money and it’s time we focused not just on GDP but on GWB – general well-being’ (see Stratton, 2010). Perhaps most significant of all, however, is the message flowing from the United Nations, which recently expressed the need for a new economic paradigm, convening an international conference on this theme in April 2012, tellingly hosted by the government of Bhutan (see Royal Government of Bhutan, 2012). These types of politico-economic developments have arguably been made possible by a growing cultural dissatisfaction with conventional measures of progress based on GDP, evidenced by the surge of interest in alternative indicators.

The disruptive potential of this shift in thinking lies in the fact that ‘what we measure affects what we do’ (Sen, Stiglitz, and Fitoussi, 2010: *xvii*). If alternative indicators continue to take root in the public consciousness, this may make it much easier to frame the transition to a low-carbon world as something that is genuinely in a nation’s interest, even if it is not a policy that maximises GDP.

2.8. Taking control: Direct action, political protest, and democratic awakening

In any social context that is shaped by an apathetic citizenry, the decisions of government are more likely to be influenced by lobby groups and narrow, corporate interests, which will tend to privilege profits over people and planet. It follows that any transition beyond fossil fuels is going to depend not only on a citizenry that *wants* such a transition, but also on a citizenry that is prepared to *struggle* for it against such vested interests. Movements such as the divestment campaign and transition initiatives, especially, are examples of communities getting active in driving change in the socio-cultural sphere, attempting to undermine the status quo and build an alternative by participating in transformative, grassroots action. Promisingly, there also seem to be other signs of a renewed

political sensibility that recognises the importance of participating, as far as possible, in the decisions that affect one's community, and actively resisting when the voices of ordinary people seem to be ignored. These political acts go beyond being merely transformative, and at times can be better characterised as transgressive.

One such example is the new 'Lock the Gate' movement in Australia. On its website (Lock the Gate, 2014), the movement defines itself as follows:

Lock The Gate Alliance is a national coalition of community groups from across Australia who are uniting to protect our common heritage – our land, water and future – from reckless coal and gas expansions. In a David-and-Goliath struggle of farmers against mining giants, everyday citizens against global corporations, our communities are choosing grace under fire and displaying incredible courage, integrity and imagination.

Formed in 2010, this people's movement has grown to include thousands of participants and over 160 community action groups. The movement is mobilising against the fossil fuel industry, organising town meetings, and even engaging in acts of civil disobedience, in order to ensure that their voices are heard. More transgressive still is the relatively small but prominent activist group 'Quit Coal', who regularly employ peaceful acts of civil disobedience – such as scaling public buildings and locking themselves to industrial equipment – to bring public attention to climate-related issues in the hope of disrupting the expansion of the fossil fuel industry. As the climate situation worsens, it could be that more people are driven to what might seem, at first, like desperate acts of resistance. Desperate times arguably call for desperate measures.

Although these types of political resistance movements are focused directly on the fossil fuel industry, there are other movements, both in Australia and around world, which are similarly transgressive without being directly or exclusively focused on the fossil fuel industry. The relevance of these broader political movements to the present discussion lie in the fact that, while they may not be solely or even primarily defined by climate issues, they may contribute to the 'disruption' needed for our world to change course, through their direct confrontation with the power structures of global capitalism.

The Occupy Movement is one of the most prominent and 'disruptive' social uprisings of recent times, and deserves special note. Branded and organised by the anti-consumerist magazine *Adbusters*, the Occupy Movement was launched on 17 September 2011, when protesters set up a demonstration 'camp' in the Zuccotti Park, New York, situated symbolically close to the world's most

significant financial base: Wall Street. Over coming months, similar occupations took place in over 951 cities, across 82 countries. This was an innovative form of political demonstration, which brought huge media attention to the issues of inequality and democracy that seemed to be the primary (though by no means the exclusive) motivations for the occupations. Media attention was heightened further when police forces around the world began forcefully removing the protesters from their places of occupation, often resulting in scenes of intense confrontation, sometimes violence. Although the movement has since lost momentum (and its media attention), Cornel West asserts that the Occupy Movement represents a ‘democratic awakening’, and the *Financial Times* states that the movement altered ‘the terms of political debate’.

The expectation of further and more regular political demonstrations is not without grounds (irrespective of whether future demonstrations march under the banner of ‘Occupy’). A recent report by the Initiative for Policy Dialogue (IPD) presents a comprehensive review of protests around the world between 2006 and 2013, and concludes that there has been ‘a steady increase in the overall number of protests every year’ (IPD, 2013: 5). Not only are protests becoming more regular, the number of people protesting is rising. The IPD report (2013: 6) states that ‘Crowd estimates suggest that 37 protests had one million or more protesters; some of those may well be the largest protests in history (e.g., 100 million in India in 2013, 17 million in Egypt in 2013).’

And why shouldn’t many citizens of the world feel aggrieved by the way their economies have distributed the product of decades of unprecedented economic growth? A recent report by Oxfam (Fuentes-Nieva and Galasso, 2014) shows that the 85 richest people now own the same as the poorest half of humanity (3.6 billion people); the richest 1% own 65 times more than the poorest 3.6 billion people; seven out of ten people live in countries where economic inequality has increased in the last 30 years. This extremely skewed, and indeed increasing, disparity of wealth is a result of political choices that have shaped property, market, and tax structures over many decades, and increasingly it seems that people are demanding that their governments reshape those structures to systematically broaden the distribution of wealth. This is part of a broader call for ‘real democracy’, which is reportedly the primary issue that has motivated political protests globally in recent years (IDP, 2013).³ Similarly, from an environmental perspective, Naomi Klein (2013) argues that ‘science is telling us all to revolt’.

³ There have also been promising experiments in ‘deliberative democracy’ in various parts of the world, through which lay people are given responsibility

Another reason for thinking that political demonstrations could grow in number and intensity in coming years – potentially disrupting the status quo – is that the global economy continues to struggle and show signs of instability. When economies are doing well, keeping unemployment low and promising a rising living standard, people are less inclined to take to the streets in protest. A comfortable citizenry does not often call for a revolution. But what if historic rates of growth are coming to an end due to resource scarcity (Turner, 2012), the end of cheap energy (Heinberg, 2011), and/or further credit and debt crises (Tverberg, 2012)? What if more and more people find themselves without jobs, or with declining living standards, even as the world's richest get richer? Food crises and expensive energy have been widely cited as grounds for the revolutionary uprisings in Egypt in recent years, producing what is now referred to as the 'Arab Spring'. This is indicative of the type of dynamic being discussed – namely, that as life gets harder, eventually there comes a threshold point when civil discontent develops, sometimes explosively, into political resistance, sometimes with revolutionary intent. Bearing that in mind, it is worth noting that in the US, 95% of post-financial crisis growth went to the top 1%, with the bottom 90% getting poorer. How long this will be tolerated is an open question.

Again, the reason for discussing these issues is not because these forms of political protest are directly or exclusively related to climate issues. Sometimes climate has nothing to do with them. But if future civil discontent – locally, nationally, globally – manages to produce a different kind of political reality – something 'other' than capitalism as we know it, perhaps something 'other' than capitalism in any form – then it may be that whatever it is that existing capitalism is replaced with could advance the movement toward a low-carbon society. The reasoning here is that if escalating demonstrations of political resistance manage to create political systems that truly advance the common good, and respect the rights of future generations to a healthy planet, then one would think that such a system would recognise the risks of fossil fuels and initiate a rapid transition away from them.

for allocating funds to council. Interestingly, it seems that these modes of democracy produce more socially and environmentally conscious policies, suggesting that many politicians would make more progressive decisions if they truly represented their constituencies.

3. Conclusion

Any transition beyond fossil fuels is going to need a coordinated, multifaceted effort between various spheres of life: social, economic, technological, institutional, and political. This chapter has reviewed various innovations in the socio-cultural sphere – innovations that have the potential to ‘disrupt’ the current trajectory and rapidly reorient the world toward a low-carbon future. Just as the socio-cultural sphere will need the support of disruptive innovations in other spheres of life, it is also likely that even the innovations *within* the socio-cultural domain will need to be coordinated in order provide mutual support, if they are to fulfill their transformative potentials. Although this analysis has only skimmed the surface, the innovations, campaigns, movements, and strategies reviewed in this chapter can be summarised as follows:

- The divestment campaign has the potential to undermine the financial foundations of the fossil fuel industry and provide a huge amount of reinvestment capital to scale up renewable energy systems. As well as gaining increasing support from those motivated primarily by climate issues, the fear of ‘stranded assets’ could also mobilise large shareholders in the fossil fuel industry to divest for self-interested reasons. Whatever the motivation for divestment, the fossil fuel industry cannot exist without financial support from investors.
- The Transition Towns Movement could be the social movement which shows that communities have the power to lead the way to a low-carbon future. Through the strategy of localising the economy, Transition Initiatives are turning crises into opportunities for cultural renewal. In a time of widespread political paralysis, not waiting for governments to lead the way is a necessary strategic move.
- Collaborative consumption and the ‘sharing economy’ are providing ways to reduce fossil fuel-driven production through sharing existing goods, spaces, skills, etc. Online technologies are reducing the ‘transaction costs’ of sharing, creating innumerable new opportunities for collaborative consumption and threatening to undermine ‘traditional’ economic relationships and structures based on exclusive ownership.

- New community-based renewable energy projects are seeking to overcome political paralysis by side-stepping politics. While top-down support for renewable energy is still highly desirable, and perhaps necessary, energy and financing innovations in the socio-cultural domain are threatening to achieve what most of our political actors are refusing even to aim for.
- Community-driven urban agriculture projects are many and varied – as they should be. While each of them in isolation can seem insignificant, together they point to a growing social concern over where our food comes from and how it is produced. New open source innovations, such as Open Food Network, are connecting local farmers with urban markets, in ways that have the potential to fundamentally change how urban populations source food while radically reducing the carbon-intensity of food production and distribution.
- The Voluntary Simplicity Movement presents itself as the social movement that most coherently ‘reimagines the good life’ – directly challenging energy-intensive consumerist cultures by showing that lifestyles of reduced and restrained consumption can produce a high quality of life. If more people were to see the personal benefits, as well as environmental and social benefits, of embracing lifestyles of voluntary simplicity, then a new low-carbon culture of consumption could be born. David Holmgren argues a relatively small but radical anti-consumerist movement could disrupt the existing growth-based economy.
- By entering public consciousness, alternative indicators to GDP could fundamentally redefine what we mean by ‘progress’, providing measurement tools that highlight the social and ecological costs of narrowly economic conceptions of wellbeing, while opening up political space for bold policies seeking radical reductions in emissions.
- Direct forms of democracy and political protest seem to be on the rise, exemplified by movements such as ‘Lock the Gate’ and ‘Occupy’. In good economic times, people are less likely to mobilise for political resistance. If it is the case, however, that historic rates of economic growth are being constrained by the biophysical limits to growth, then populations once pacified by the promise of increasing

living standards might become increasingly agitated, especially if disparities of wealth remain so vast. While it is impossible to predict the ways in which such social agitation could transpire, political resistance to the status quo becomes more likely, in more places, as the steam of discontent builds pressure.

Could it be that the socio-cultural conditions for rapid transformation are almost here? While it remains difficult to be confident, this review suggests that it would be premature to despair.

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