Just Transitions and the Next Long-Term Development Cycle: Some Warnings from the African Continent

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“The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear.” – Antonio Gramsci


Introduction

As the world heads into the fifth year of the global depression, many have started to search for the coordinates of the next long-term development cycle. Inevitably, they are looking back over time to reinvent historical patterns which can then be projected onto the future. Even a short-run view back over the past 250 years since the start of the industrial revolution will confirm that there are, indeed, historical cycles to draw on (Gore 2010; Perez 2002). A longer-term view over millennia will also reveal socio-metabolic rifts as we have progressed from hunter-gatherers, to agricultural societies with new divisions of labour, and eventually to the more complex industrial nation-states of the modern era (Diamond 1997; Fischer-Kowalski & Haberl 2007). We can, of course, combine these longer- and shorter-term perspectives to find in the dynamics of the current cycles clues to the latter’s more pressing demands (Swilling & Annecke 2012). Given that 2009 was the first year since WW II that the global economy shrank, it arguably marks the end of a long-term ‘Kondratiev cycle’ and possibly the start of the next – or, at least, the start of a transition period that lies in between the post-WWII Kondratiev cycle that has ended and the start of the next that must still emerge (Gore 2010). As we ponder the ‘morbid symptoms’ of this interregnum, many writers cannot resist drumming up support from history to conjure images of the future to help influence the decisions taken today.

This paper will review some of the emerging stories of the future that have been generated by the global crisis. By drawing on the multi-level perspective on sustainability transitions (Grin et al 2010), neo-Schumpeterian perspectives (Gore 2010; Kohler 2012) and a political ecology perspective on transitions (Lawhon & Murphy 2011), it will be argued in the first part of the paper that these are attempts by elite actors to re-imagine a post-crisis landscape in ways that for some will preserve the status quo (using, for example, market-oriented ‘green economy’ discourses) while for others quite significant changes in the patterns of production and consumption that have dominated the post-WWII period are envisaged. As such, these re-imaginings deserve attention because - thanks to the pervasive use of computer-aided scenario-building in recent times - images of the future do influence decisions that can shape these futures. However, the primary concern of this paper is not just stories of the future, but also the kinds of real-economy conditions that could materially contribute to the possibility of a more sustainable and equitable future. In the second part of the
paper, it will be argued that rising resource prices have joined climate change and eco-system services as a key landscape driver of change. After over a century of declining resource prices, the steady rise of resource prices since the turn of the millennium is clearly a game changer. It will be argued that the rise to prominence of the ‘green economy’ discourse reflects a growing recognition of this inflection point. This does not, however, automatically imply the unfolding of a sustainability transition precisely because the socio-political regimes and institutions of the post-WW II era remain dominant. These images of the future and the emerging green economy discourse have highly uneven implications for different parts of the world. It will be argued that while rising resource prices can both undermine attempts to stimulate growth in the short term and/or spur innovations over the longer term in resource importing countries, rising resource prices can create new opportunities and threats for resource-rich resource-exporting countries on the African continent. In the final part of the paper I consider the implications of this unevenness by discussing possible institutional innovations that could connect Africa to the wider global transitions to greener and more resource efficient modes of economic growth and development. As the demand for resources in a finite world pushes up resource prices, how should resource-rich resource-exporting African countries respond? Does the temptation of rising resource prices reinforce the ‘resource curse’ in the name of generating short-term revenues to invest (ostensibly) in poverty eradication, or is a long-term perspective possible that envisages a steady flow of resource rents to fund the purposive build-up of technological capabilities and sustainability-oriented innovation systems that can over time result in an authentic sustainability transition? What kinds of niche innovations are creating spaces for learning that could either replace or transform the existing resource- and energy-intensive industrial regimes? I conclude by suggesting that the African case provides warnings for what could go wrong if an appropriate set of long-term policy frameworks and institutional arrangements are not put in place to take advantage of the underlying conditions that are making a sustainability transition possible. Do these countries want to yet again miss extra-ordinary economic opportunities because they failed to put in place an appropriate set of socio-political and socio-technical regimes to facilitate learning, innovation and technological capability development?

Re-imagining the landscape: crises, cycles and waves

According to the multi-level perspective (MLP) on sustainability transitions, the macro-level socio-technical landscape provides the context for the relatively autonomous institutionalisation of socio-technical regimes and the initiation of niche innovations protected somewhat from potentially hostile market and political dynamics (Grin et al 2010). Regimes are institutionalised configurations of shared assumptions, technologies, regulations, market norms and consumer preferences that ‘lock in’ a particular mode of production and consumption. Niches, on the other hand, are loci for radical innovation that can either subvert or reform existing regimes depending on the dynamics and intensity of the landscape pressures. A regime can reform itself by tapping internal innovations and/or external knowledge that has evolved in niches, or it can deny/resist change and eventually collapse (Smith et al 2005). If it collapses, a new regime is constituted from the knowledge sets that have evolved within the niches. The landscape includes “environmental and demographic change, new social movements, shifts in general political ideology, broad economic restructuring, emerging scientific paradigms, and cultural developments. Landscapes provide an influential backdrop with ramifications across a variety of regimes and niches: providing gradients and affordances for how to go about establishing socio-technical configurations that service societal needs.” (Smith et al 2010:7 - emphasis added)
Following Rotmans and Loorbach, a key aspect of the transition management approach is the facilitation of engagements between actors to develop shared visions of the future (Rotmans & Loorbach 2009). However, these actors – who are, as Lawhon and Murphy point out, largely drawn from corporate, scientific and policy elites (Lawhon & Murphy 2011) - arrive at these engagements with preconceptions of the future that shape the discourse. These preconceptions are, in turn, influenced by a variety of academic, semi-academic and popular writing that construct imaginaries of future trajectories. What follows below is a review of a set of typical perspectives that all aim in one way or another to re-imagine the “gradients and affordances” of a future socio-technical landscape that transcends the present crisis-ridden landscape on terms that may, depending on who uses the ideas, challenge existing power structures. To conduct this analysis, a neo-Schumpeterian perspective on ‘long waves’ is used to help elucidate the changing dynamics of the socio-technical landscapes as understood by the MLP. This is necessary because the “MLP views a transition as a one-off process in history” whereas what really matters is the way different waves overlap as one matures and the next starts to emerge (Kohler 2012:10).

Six key texts will be briefly reviewed, all of which systematize, in one way or another, a set of storylines about the future that are easily recognised in the diverse range of popular discourses about the future that have proliferated since 2007/8. They represent, therefore, clusters of discursive and cultural ontologies of probable futures (Geels 2010). These texts are: Standard Chartered, The Super-Cycle Report (2010); Arun Motianey, Supercycles: the new force transforming global markets and investment strategy (2010); Allianz Global Investors, The sixth Kondratieff - long waves of prosperity, (2010)¹; J. Bradfield-Moody & B. Nogrady, The Sixth Wave: how to succeed in a resource-limited world (2010); Von Weizsacker et. al.’s Factor Five (2009); and Jeremy Rifkin’s The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy and the World (2011).

Compiled by the research division of Standard Chartered, the core argument of their report is that there have been two major “supercycles” plus a third which is current; namely 1870-1913 when the global economy grew on average by 2.7% per annum; 1946-1973 when economic growth rates averaged 5%; and 2000 – 2030 when economic growth is expected to average out at 3.5% with the current recession seen as a relatively brief moment of “rebalancing” (Standard Chartered 2010). The definition of a supercycle is “a period of historically high global growth, lasting a generation or more” and which is characterised by a nation that becomes a dominant economic driver (Standard Chartered 2010:1) For Standard Chartered, the shift in economic power from the “West” to the “East”, rapid urbanisation and the massive future growth of the Asian middle class are seen as the key drivers of the next supercycle (2000-2030). Interestingly, the period between the 1970s and 2000 is seen as a period of weak debt-financed growth in the West, economic stagnation in Japan, collapse of the Soviet Union, debt and currency crises in Latin America, while China and India had not yet “opened up”. As a result “[t]here was no dynamic driver for the world economy” during this period (Standard Chartered 2010:3).

The key fact that is used to substantiate the argument that we are now well into a third supercycle is that the global economy in 2010 was almost twice the size it was in 2000 (i.e. a GDP of $32trn in

¹. This particular report uses the ‘Kondratieff’ spelling, whereas usual practice is to use ‘Kondratiev’ which is the spelling used in the remainder of the paper.
2000, rising to $62trn in 2010) – a trajectory driven mainly by growth in the East, a driver that is seen as lasting for at least two more decades. Yes, Standard Chartered admits, there are challenges today, but good policy decisions will sort out the economic problems in due course; and in a very short section it is argued that innovation will deal with the problems of climate change and rising resource prices (including rising oil prices which are specifically mentioned as an unpredictable threat). Global GDP is, therefore, confidently expected by Standard Chartered to be $143trn by 2030 (in real terms) which is, of course, more than double what it was in 2010.

Arun Motianey worked for Citibank for thirty years which, he says, allowed him to experience first-hand the real workings of the booms and busts of the global financial system as it evolved during the period of globalised financialisation starting in the late 1970s (Motianey 2010). He concluded that how this system actually works contradicts the prevailing theories of how it should work. He sets out to debunk the notion that we can understand national economies as aggregations of individual/household transactions, and the global economy as aggregations of national-level economic dynamics. Instead, the globalised architecture of the financial, trade and production system has given rise to a socio-technical landscape that he calls a “supercycle” that has its own autonomous logic and “laws”. He equates a supercycle to a large undulating integrated pipeline that is constituted at the level of the global economy unrelated to the specific dynamics of each national economy – a classic ‘landscape’ dynamic in MLP language. A supercycle starts with the extraction and processing of commodities, proceeds through to the production of intermediate goods, and ends with consumable goods and services that are bought and consumed by end-users (households, businesses). Waves of goods flow through the pipeline, expanding and contracting in line with the complex logics of price-regulated supply and demand. The problem is that in a world of nations comprising multiple currencies and exchange rates, as a price drops somewhere along the pipeline for whatever reason, this translates into higher profits and therefore over-investment in capacity, assets and expanded employment further down the pipeline. This would not be a problem if prices were a true reflection of economic value, but they are not because of institutional inefficiencies. Instead, the (frequently debit-financed) over-investment in capacity, assets and expanded employment translates into asset bubbles that end in crashes followed by deflation. This pattern starts at one end of the pipeline and gradually and steadily gets transferred down the pipe driving the booms and busts along the way that we now know so well. The hyper-financialisation of the global economy oiled the wheels of this roller coaster: fostered by the US Federal Reserve and the US Treasury, financialisation (made possible by the deregulation of financial institutions – or what former UK Prime Minister Gordon Brown called the ‘light touch’) created the space for financial innovations that were used to accelerate and profit from transacting these booms and busts. Speculators and transactors made their profits, leaving behind a trail of economic devastation. As Motianey puts it:

“Like a long snakelike balloon losing air, the pipeline begins to deflate at one end (the bust), which makes the next section closest to it on the balloon (the boom) appear to inflate. But then eventually the deflation travels through the entire length of the balloon.”

For Motianey, once deflation has worked its way through the pipeline, the end-point is either a great big crash due to policy failure (as happened after the 1929 crash), or a prolonged unproductive malaise similar to what has afflicted the Japanese economy since the 1990s. The Japanese malaise writ large is his metaphor for the future. Accordingly, therefore, he looks back and sees two great
socio-technical landscapes or “supercycles”. The first is what he calls the Classical Supercycle which began with the adoption of the Gold Standard in the 1870s and ended in the early 1930s with the mass destruction of productive capacity as states held back from intervening after the 1929 crash until it was too late. The second supercycle is what he calls the Modern Supercycle which began with the formation of what he calls the “Volcker Fed” in 1979 and continues well into the second decade of c.21st. The deregulation of the global financial system that the US Federal Reserve promoted made it possible to create a gigantic pipeline of interlinked sovereign surpluses and debt that drove the booms and busts around the world – from the Latin American debt crises of the 1980s, transferred to the Asian crashes of the 1990s, and then on to the sovereign debt crises of developed economies in the 2000s. However, the key difference is that unlike the end of the Classical Supercycle, states have learnt to respond with counter-cyclical measures that have transferred household and banking debts into sovereign debt coupled to austerity measures, while simultaneously keeping interest rates low in the hope of stimulating growth. Because monetary authorities are determined to also keep inflation low, the end result is what Motianey calls the Great Malaise – a prolonged uncreative deflationary depression. The only alternative, in his view, would be to accept that a new era of inflation is needed to devalue the debt and realign the prices of production and consumption. But the resulting “creative destruction” (to use Schumpeter’s famous words) not only runs contrary to economic orthodoxy, it is also contrary to the interests of the banks who resist all attempts to devalue what they are owed by the governments of the world. So contrary to the optimism of the Standard Chartered report, he concludes:

“We will not face the Second Great Depression; more likely we will face the first Great Global Malaise – where the whole world looks like Japan – or perhaps the Great Stagflation.”
(Motianey 2010:XX)

As the global economy bumps along the bottom into its 5th year of recession, the combined impact of debt-constrained fiscal intervention, the limits to monetary policy imposed by ultra-low or even negative real interest rates and the build-up of unprecedented reserves of unspent cash by investors seems to confirm Motianey’s profound pessimism. It must surely be more than a glitch in a long-term upward trend.

While reports like the one from Standard Chartered see a saviour in the birth of an Asian middle class (with, ironically, interventionist states as mid-wives – a factor conveniently left unmentioned), Motianey’s perspective blames economic orthodoxy for the gutless opposition to the inflationary dynamics needed to flush out the deadwood of accumulated debt that is responsible for the Great Malaise. Both, however, ignore the question of sustainability; while the next three perspectives directly link solutions to the global economic crisis to a transition to a more sustainable global economy.

The report published by the global asset management company Allianz Global Investors argues that the current global economic crisis marks the beginning of the end of the “fifth Kondratiev cycle” and the start of the “sixth Kondratiev cycle” (Allianz Global Investors 2010). Following the tradition started by Kondratiev, the Russian economist who first thought of economic history in terms of long waves of 40 to 60 years (Kondratieff 1935), Allianz notes that during the first phase of the Kondratiev cycle interest rates go up as demand increases for capital to fund the investments in new technologies formulated by the alliances between innovators and entrepreneurs. However, this is
not a problem because earnings from the new value chains that get created easily cover the costs of capital as profit margins soar. However, diminishing returns over time on investments in ever-maturing technologies reduces the demand for credit resulting, in turn, in a decline in real interest rates. Every major crisis, including the present one, has been brought on by this dynamic, the Allianz report argues. The conditions that lead to a new Kondratiev cycle include the exhaustion of the potential of mature technologies, an excess of financial capital versus physical capital, recessionary conditions and social/institutional transformation. Allianz argues that all these conditions pertain today. The obvious question, therefore, is what combination of technological innovations will become the focus of the next – the 6th - Kondratiev cycle. Their answer is as follows:

“While in the previous Kondratiev cycle the information age led to a tremendous increase in labour productivity, the key to a strong and sustainable economy in the next long cycle seems to lie in an increase in the productivity of resources and energy.” (Allianz Global Investors 2010:12 - emphasis added)

As reflected in Figure XX, by harnessing information technologies, innovations in the “green-tech”, biotechnology, nanotechnology and health care (driven by aging populations) sectors will become the drivers of the next cycle. Significantly, they see the developed economies as the technology leaders of this new socio-technical landscape because their levels of investment in innovation are higher than in developing countries where the focus is still on growth to meet rapidly expanding consumer demand. While developing economies are seen as the economic “accelerator” of future global growth, developed economies benefit from being the lead innovators [read: owners of the intellectual property that the rest of the world will need] – this being an interesting coupling of
quantitative (developing world) and qualitative (developed world) dynamics to imagine a future global socio-technical landscape.

Bradfield-Moody & Nogrady also imagine a future socio-technical landscape in terms of the dynamics of a “6th wave” (Bradfield-Moody & Nogrady 2010). Written in a journalistic style for a business audience, it is an upbeat manifesto for those who want to believe that a sustainable world can be brought about by smart investors with sufficient vision to realise that the best returns will be generated by technological innovations that reduce waste, generate renewable energy, increase resource productivity and copy the organising principles of nature (biomimicry). The “6th wave” is presumed to have started already because annual new investments in renewable energy have already overtaken new investments in fossil fuel-based energy. The 5th wave – the information and communication wave – is depicted as a response to the sclerotic bureaucratized business regimes that emerged during the inter-war years. By the 1970s these highly inefficient regimes were pushing up transaction costs in a way that restrained the growth potential of expanding global markets. By massively reducing transaction costs, the information and communication technologies subverted the institutional architecture of the post-WWII boom and created the extra-ordinary business opportunities that became the drivers of the 5th wave. But the “transaction cost revolution” drove down the costs of production as a new generation of information-driven regimes proliferated, accelerating global economic growth resulting, in turn, in rapidly rising prices of depleting natural resources, including climate space. The constraint now, therefore, is not transaction costs, but the resource costs generated by an entrenched set of resource- and energy-intensive regimes. It follows, therefore, that the 6th wave will be driven by innovations that will deploy the information technologies of the 5th wave to unleash a “revolution that will see our world transformed from one heavily addicted to the consumption of resources, to a world in which resource-efficiency is the name of the game.” They then conclude that: “In this next wave of innovation, resource scarcity and massive inefficiencies will be the big market opportunities.” (Bradfield-Moody & Nogrady 2010) In short, they envisage a whole new generation of resource-efficient regimes that will have responded appropriately via the market to the rising resource prices created by accelerated resource depletion at the landscape level.

Led by well-known sustainability thought leader Ernst Von Weizsacker, the co-authors of Factor Five tell a very similar story to Bradfield-Moody and Nogrady, albeit in a less triumphalist business-manifesto kind of way and with greater appreciation for the role of appropriately ambitious public policies to create the spaces for innovation (Von Weizsacker et al 2009). They repeat the familiar image of the five Kondratiev waves and suggest that a sixth “innovation wave” is already emerging driven by technological innovations that can improve resource productivity by 80%. What is significant about Factor Five is the systematic presentation of a wide range of empirical evidence from across the building, heavy industry, agricultural and transport sectors to substantiate the claim that niche-level innovations have already generated the technologies that are needed to create fully-fledged economy-wide socio-technical regimes that can improve resource efficiencies by 80% (i.e. by a factor of five). Put simply, by way of example, a fivefold increase in the energy efficiency of a

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3. Some of the Australian co-authors of this book had already elaborated the core logic of the “6th wave” in an earlier work entitled The Natural Advantage of Nations (Hargroves & Smith 2005).
house designed according to the German *passivhaus* standard will use 200 kWh/month instead of 1000 kWh. Likewise for many other innovations. What is significant about the current transition, they argue, is:

“...the availability of a wide range of fascinating new technologies promising to be roughly five times more resource efficient than those still dominating industry, households and the service sector. So we do not hesitate to call for and promote a new Green Kondratiev cycle.” (Von Weizsacker et al 2009)

![Graph showing innovation waves from 1785 to 2020](image)

(Source: Hargroves & Smith 2005)

Significantly, Von Weizsacker et al. clarify what they mean by resource productivity (used interchangeably with resource efficiency) by equating it to the more familiar notion of labour productivity. They point out that labour productivity increased twentyfold over the past 200 years. Labour productivity improved by 1% per annum up until the mid-c.20th, and thereafter by 2-3% per annum (Von Weizsacker et al 2009:15). This made rising real wages possible. Resource productivity, however, was never a priority, especially in light of the fact that real resource prices declined over the century ending in 2002 (Fischer-Kowalski & Swilling 2011). Labour, however, is no longer in short supply – the limiting factor now is depleting resources. It follows, Von Weizsacker et al. argue, that “[r]esource productivity should become the main feature of technological progress in our days” (Von Weizsacker et al 2009:17). Taking this to scale is the transformative driver of the emergent socio-technical landscape that *Factor Five* sets out to imagine by drawing from actually existing resource efficiencies generated across a wide range of niches and regimes.
This brings us to Jeremy Rifkin’s *The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy and the World* (Rifkin 2011). Rifkin is a sustainability superstar with a long record of high-level policy involvement in European policy-making circles. He writes, however, in an activist style for a broad popular audience about a ‘brave new world’ that can be brought about by those long-sighted enough to share his vision. Whereas Bradfield-Moody & Nogrady focus on entrepreneurial opportunities created by markets and Von Weizsacker et al. put their faith in the potential of sustainability-oriented technological innovations, Rifkin is interested in the reconfiguration of socio-institutional power relations brought on by the “conjoining of Internet communication technology and renewable energies”. “We are”, he argues, “in the midst of a profound shift in the very way society is structured, away from hierarchical power and toward lateral power.” It is this shift that is the distinctive mark of Rifkin’s “third industrial revolution”.

Indeed, for Rifkin the driving force of all major epochal shifts is the reconfiguration of conjoined energy and communication technologies that shape, in turn, the wider structures of economic and political power. The first industrial revolution, which commenced in the mid-c.19th, began when steam-powered technology was introduced into printing which, in turn, revolutionised communications and education with the latter responsible for the creation of the literate workforce needed to “organize the complex operations of a coal-powered, steam-driven rail and factory economy”. The Second Industrial Revolution began in the first decade of the c.20th when “electrical communications converged with the oil-powered internal combustion engine”. Long-distance power supplies, telephone lines and highways soon followed creating the connectivity infrastructure that made possible the emergence of mass production and consumption in the c.20th. The Third Industrial Revolution, which will come to dominate the c.21st, will emerge from the fusion of Internet and renewable energy technologies to create a new “intergrid” of intelligent distributed electricity networks. This is what will subvert the “conventional top-down organization of society” and replace it with “lateral power” - “distributed and collaborative relationships in the emerging green industrial era”.

Rifkin identifies five dimensions of this future socio-technical regime (his “five pillars”) that will characterise this green industrial era: 1. renewable energy will have replaced fossil fuel-based energy; 2. every building will become its own power station; 3. energy storage will be built into every building (including hydrogen); 4. using the Internet, smart grids will be used to manage the infrastructures that conduct resource flows through socio-ecological systems (including trading between households and neighbourhoods); and 5. the combustion engine will have been replaced by vehicles with electric engines powered (via battery or fuel cell technologies as the storage mechanisms) by an interactive power grid connected to renewable energy generation.

Standard Chartered and Motianey represent two ends of a spectrum of debate about long-term cycles that deal only with economic matters (with, at best, environment tacked on as a problem to be resolved by innovation): the former optimistically assumes that Asian demand is such a powerful landscape dynamic that it will continue to relentlessly drive global growth for another two decades, while the latter predicts a Japan-type Grand Malaise as deflation works its destructive way through the global economic pipeline reinforced by the all-pervasive fear of inflation.

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4. For this reason, maybe Rifkin is to the ‘6th wave’/3rd industrial revolution’ what Alvin Toffler was to the information revolution.
In contrast to these two economistic narratives, the Allianz report, Bradfield-Moody & Nogrady and the Factor Five group all go beyond economic dynamics to identify wider environmental landscape factors (primarily resource depletion and global warming). They all envisage a sustainability transition by invoking Kondratiev cycles to conjure up images of more sustainable long-term growth: for Allianz ‘greentech’ and ‘health’ will drive the next Kondratiev cycle; while for Bradfield-Moody and Nogrady, declining transaction costs and rising resource prices create the new market opportunities that will drive the “6th wave”. Factor Five assembles a vast empirical compendium of niche innovations and regime adjustments to substantiate the argument that the 6th innovation wave has already begun. However, they also warn that if major global environmental crises at the landscape level are to be avoided, investors and policy-makers will need to make sure the 6th innovation wave is aggressively accelerated by way of purposive policy interventions to upscale factor five technologies.

Rifkin introduces what might well be the operating system of the 6th wave – a vast and rapid institutional transition from hierarchical to lateral power as internet and renewable energy technologies conjoin to create a totally new set of energy-communication regimes. Significantly, these four perspectives on the sustainability transition are in agreement that the next Kondratiev cycle will be driven by a combination of technologies that respond to the economic consequences of rising resource prices. In this respect they are supported by UNEP’s International Resource Panel and the McKinsey Global Institute whose respective empirically rich and substantiated reports confirm that a century of declining resource prices has ended and that resource depletion is a major threat to business-as-usual (Fischer-Kowalski & Swilling 2011; McKinsey Global Institute 2011). Reports like the one produced by Standard Chartered have clearly ignored this threat to their optimistic scenario, and pessimists like Motianey may have failed to recognise the real underlying cause of their Grand Malaise. However, except for the UNEP report to a limited extent, none of these influential analyses draws attention to the uneven impact of these dynamics on the consumer-oriented developed world versus resource-rich resource-exporting developing countries. Before we get to this, we need a better understanding of the green economy discourse.

Making Sense of the Green Economy

During the course of 2009 both Barack Obama and Gordon Brown began talking about a “global green new deal”. Two substantial reports released in 2011 seem to substantiate this apparent ideological acceptance of the fact that the global economic crisis and the global environmental crisis are inextricably interlinked (Barbier 2009). The first is by UNEP entitled Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication commonly referred to as the Green Economy Report or GER (United Nations Environment Programme 2011); and the second is the United Nations World Economic and Social Survey 2011: The Great Green Technological Transformation commonly referred to as the UNWESS 2011 Report (United Nations 2011). By mobilising insights from models and vast amounts of empirical information from across all economic sectors, both reports confirm that solutions to the current global economic crisis that do not address global warming and the underlying resource and ecological constraints are doomed to fail. In a remarkable opening statement, the GER cuts to the root of the problem:

“The causes of these crises vary, but at a fundamental level they all share a common feature: the gross misallocation of capital. During the last two decades, much capital was poured into
property, fossil fuels and structured financial assets with embedded derivatives. However, relatively little in comparison was invested in renewable energy, energy efficiency, public transportation, sustainable agriculture, ecosystem and biodiversity protection, and land and water conservation.” (United Nations Environment Programme 2011:14 - emphasis added)

Both the GER and UNWESS Reports agree that a green economy is low carbon, resource efficient, restores eco-systems and is socially inclusive. Policy options for zero growth or an exclusive focus on population reduction to achieve environmental sustainability are ruled out because of the negative impact on poverty eradication programmes in developing countries. The only alternative is, therefore, “reducing non-renewable energy and resource use, reducing waste and pollution, and reversing land degradation and biodiversity losses” (United Nations 2011:VI). Both explicitly set out to transcend the “myth” that there is a trade-off between economic growth and sustainable resource management. And both emphasize the vital importance of public policy and the leading role of governments – as the UNWESS Report puts it: “[t]he needed acceleration of technological innovation and diffusion is unlikely to occur if left to spontaneous market forces.” (United Nations 2011:22-23).

The analysis and policy prescriptions of both reports relate to three dimensions: the traditional concerns with climate change mitigation (reducing CO2); reducing biodiversity losses and the need to restore degraded eco-system services; and what is generally referred to as resource and energy efficiency. Surprisingly, and in contrast to some of the texts reviewed in the previous section, rising resource prices and related innovations are not given much emphasis. Instead, carbon reduction and biodiversity restoration are clearly seen as more significant drivers than rising resource and energy prices.

The GER model analyses the potential impact of investing 2% of global GDP on an annual basis (about $1.3 trillion/annum) to 2050 into green economy sectors, and compares this to a business-as-usual scenario. Half of this investment is allocated to energy efficiency (buildings, industry and transport) and renewable energy measures that will achieve global carbon reduction targets by 2050 (mitigating the rising cost of oil is not emphasized). The remainder is devoted to waste management, public transport infrastructure and the restoration of eco-system services across a range of natural capital-based sectors (agriculture, fisheries, forestry and water supplies). The results show that a green investment of approximately $1.3 trillion/annum “delivers long-term growth over 2011-2050 that is at least as high as an optimistic business as usual case, while avoiding considerable downside risks such as the effects of climate change, greater water scarcity, and the loss of ecosystem services” (United Nations Environment Programme 2011). Other than the explicit modelling of energy prices, it is not clear whether or not the GER’s macro-economic model implicitly takes into account rising resource prices.

The UNWESS Report confirms that the kind of “fundamental technological and structural transformation” envisaged by a long-term investment in the building up of a green economy can only happen if the following five objectives can be achieved (United Nations 2011:11):

(a) Reduction of resource requirements in general and of energy requirements in particular, in both absolute terms and relatively, per unit of output;

(b) Substitution of renewable for non-renewable resources, given the total resource use;
(c) Substitution of biodegradables for non-biodegradables, at any given level of output or waste;
(d) Reduction of waste (including pollution), at any given level of resource use;
(e) Protection of biodiversity and ecosystems.”

Although both the GER and UNWESS Report envisage a radical transformation of the global economy that takes into account the poverty challenges of developing countries, it is surprising that despite explicit reference to resource efficiency in the GER and the need for “reduction of resource requirements in general” in the UNWESS Report, the potential space for sustainability-oriented innovations created by the market dynamics of – and policy responses to - rising resource prices is under-emphasized.

UNEP’s International Resource Panel (IRP), however, explicitly fills this gap. It was established in 2007 to deal with global material flows, resource depletion and decoupling (see http://www.unep.org/resourcepanel/). The IRP distinguishes between four categories of resources: biomass (everything from agricultural products, to clothing material like cotton, to forest products), fossil fuels (oil, coal and gas), construction minerals (cement, building sand, etc) and ores and industrial minerals.5 By the start of the c.21st the global economy consumed between 47 and 59 billion metric tons of resources (which is equal to half what is physically extracted from the crust of the earth). Between 1900 and 2005 total material extraction increased over this period by a factor of 8. The strongest increase was for construction minerals, which grew by a factor of 34; ores and industrial minerals by a factor of 27; fossil fuels carriers by a factor of 12 and biomass extraction increased by only 3.6-fold. Taking into account population growth, what this means is that although global resource use increased 8-fold, average resource use per capita only doubled from about 4.6 tons/capita in 1900 to between 8.5 and 9.2tons/capita by 2005. More significantly, while global resource use increased 8-fold, GDP increased by a factor of 23 for the same period (Fischer-Kowalski & Swilling 2011). As reflected in Figure XX, the result is relative decoupling between rates of resource use and global growth rates.

5. Note that water and land resources are excluded from this categorisation of global material flows – for a justification see (Fischer-Kowalski & Swilling 2011:8-9)
As the IRP Report shows, rising global resource use during the course of the c.20\textsuperscript{th} (including the metabolic shift that took place from mid-century onwards as non-renewables grew and dependence on renewable biomass declined) corresponded with declining real resource prices – a trend that came to an end in 2000-2002. Since 2000-2002, the macro trend in real resource prices has been upwards (notwithstanding dips in 2008/9 and against in 2012).
The McKinsey Global Institute report (which was published after the IRP report) generally confirms the trends identified by the IRP report (McKinsey Global Institute 2011). The McKinsey report calculates that resource prices increased by 147% in the decade since 2000 and that this cannot be separated from the fact that up to $1.1 trillion is spent annually on what they call “resource subsidies”. McKinsey argues that if resource subsidies are reduced and an additional $1 trillion per annum is invested in resource efficient production systems to meet growing demand (an amount similar to what the GER has in mind), the result will be the creation of a whole new set of “productivity opportunities” with an internal rate of return of 10% at current prices. In other words, from a long-term perspective, increasing resource productivity is a viable business opportunity for its client base. The top 15 business opportunity areas (that represent 75% of the potential resource savings) include (in order of potential) energy efficient buildings, large-scale farm yields, food waste, municipal water leakage, urban densification, energy efficiency in iron and steel production, smallholder farm yields, transport efficiency, electric and hybrid vehicles, land degradation, end-use steel efficiency, oil and coal recovery, irrigation techniques, road freight shift to rail, and power plant efficiency.

In short, the IRP and McKinsey Reports confirm the arguments reviewed in the first section of this paper that resource depletion may well drive up resource prices over the long term. As a direct input into production rather than a negative environmental impact (such as CO2), the cost of resources will unsurprisingly drive a wide range of responses from downsizing through to innovations that enlarge existing - or open up new - markets. It follows that this is a factor that deserves much greater attention when it comes to modelling green economy pathways.

According to conventional economic logic, to reduce deficits and debt, developed and some developing economies desperately need economic growth. However, high debt levels constrain
stimulatory fiscal interventions and ultra-low interest rates (in many places) means monetary policy can achieve very little. Putting aside for the moment the politically challenging alternative of lowering wage levels, there is really only one other alternative, namely investment to stimulate growth. However, investment has steadily dropped as confidence has eroded. Instead of taking risks, more and more spare funds have been squirreled away in safe low interest solvent sovereign bonds (such as Germany where the bond rate even went negative during the course of 2012).

By 2011 Gross Domestic Investment dropped to 16% of GDP in the USA which is below what it was in the early 1960s and way below the 1979 peak of 23%; and in the UK Gross Fixed Capital Formation dropped to just above 14% which is below what it was in 1960 and way below the 1990 peak of 22% (Zhengelis 2012). In plain English this means investors are not spending the profits they are making. The Economist reported on 31 March 2012 that the profits of American companies by early 2012 were higher than at any time in the past 65 years. In simple numbers, this amounted to over $1 trillion of unspent cash. In South Africa, the Minister of Finance moaned that in 2012 there was R500 billion of unspent cash held by corporates while poverty levels got worse as economic growth rates remained lower than what was required to absorb enough labour to reduce unemployment.

So if fiscal and monetary policies are ineffective, do green economy investments as proposed by the GER and the UNWESS Report (or investments in resource productivity opportunities as proposed by the McKinsey Report) really offer an investment pathway that can end the global investment strike? Dimitri Zhengelis from the London School of Economics and Senior Advisor to Cisco recently published a paper that makes a credible macro-economic case in favour of this proposition (Zhengelis 2012). Zhengelis disagrees with Paul Krugman’s unreconstructed Keynesianism which allows him to argue that debt constraints are overstated and that fiscal spending holds the key to economic recovery (Krugman 2012). He is also critical of the view that austerity measures will rebuild the levels of confidence needed to drive a sustainable global economic recovery. Unlike the Keynesians and austerity economists, his faith lies in the creation of new “additive” investment opportunities in green growth. For Zhengelis, there are two compelling reasons why investments in green growth can unlock unspent investment funds in ways that could stimulate growth: they can go to scale rapidly (decentralised renewable energy plants, for example) and they will be responsive to credible multi-year policy interventions that limit uncertainty and build confidence over time. In his words:

 Italics: “It is precisely the overwhelming and growing long-term need to address numerous market failures [such as climate change] through transformational investment and innovation that has the potential to make the opportunity from intervention so credible. ‘Green’ investment is also large-scale and offers potentially profitable markets for decades. It can therefore leverage in serious private money. As a result, much of this private investment should be additive (rather than displaced from elsewhere), helping to break out of the deflationary confidence spiral, much as Roosevelt’s New Deal did in the United States from 1933.”

Green growth, from this perspective, provides the most credible and viable way of unlocking the mountains of unspent cash chasing the diminishing pool of solvent sovereign bonds as fiscal and monetary policies fail to revive confidence in the unsustainable business-as-usual policies that prevailed in the bulk of OECD countries in 2012. Unless a credible long-term investment programme of this kind can be formulated and adopted by governments around the world, the optimistic
projections of the GER and UNWESS Report have little chance of being realised in practice. This then brings the discussion back to the dynamics of the current interregnum and what it will take to catalyse a transition to a more sustainable global economy.

**Conceptualising the Next Long-Term Development Cycle**

Thus far I have argued that diverse *stories of future landscapes* have started to emerge out of the contemporary global polycrisis. While they all project into the future their respective takes on the past, two of the six storylines reviewed (Standard Chartered and Motianey) basically ignore the natural limits to conventional economic growth models. Those that don’t ignore limits see tremendous potential in the innovations that these limits make necessary. Drawing on the proven potential across a wide range of niches, they force-march the upscaling of these innovations in order to imagine an entirely new generation of socio-technical regimes that they anticipate will be low carbon, resource efficient and restorative of the eco-system services that economies depend on. The massive quantities of detailed empirical and modelling work reflected in the GER, UNWESS, IRP and McKinsey Reports seem to confirm that there are a set of global conditions that could make possible the greening of the next long-term development cycle, especially if they help unlock the global glut of investment capital stashed away in low interest low risk bonds (Zhengelis 2012). These are, however, necessary but not sufficient conditions. To conceptualise a set of sufficient conditions, we will need to pay much closer attention to the institutional and governance structures that will be required to realise the potential for an effective sustainability transition. For this we will need a more robust understanding of the relationship between technological change, economic growth and institutions. Following Kohler it is argued that the neo-Schumpeterian perspectives on the dynamics of ‘long waves’ provides a useful understanding of the political economy of these relationships (Kohler 2012).

The substantial body of work by Venezuelan economist Carlota Perez has deeply influenced those who write about technological cycles. She identified five ‘transitions’ that she associates with specific technological innovations that emerged at particular historic moments since the dawn of the industrial era in the 1770s (Perez 2002). These transitions were roughly 50-year cycles that began with technological innovations (steam, then steel, followed by oil, and finally information) that were funded initially by high-risk investors, enticed by the profits that revolutionary new processes could generate. As reflected in Figure XX, after disrupting the previous structure of industrial organisation over two or even three decades, these innovations were themselves displaced after enjoying fairly long periods of technological dominance during a ‘deployment period’ that could last for two to three decades (Perez 2002; Perez 2007).
In the words of UNCTAD economist Charles Gore, each of these transitions is characterised by ‘the introduction of a few leading sectors which provide cheap inputs to a wide range of economic activities; the installation of large-scale transport, communications and energy infrastructures; induced investment and innovation in economic activities, which are related to the leading sectors and the new infrastructures through forward and backward linkage effects; and the creation of new organisational and managerial practices.’ (Gore 2010: 719) Each of the five periods resulted in unique configurations of primary resource inputs, infrastructures and associated innovations in order to consolidate the hegemony of the lead sectors that had become the focus of financial investment. This can only be achieved by designing and establishing an appropriate set of institutions to direct, manage and monitor capital flows, up skilling and infrastructure development.

Significantly, Perez demonstrates that each transition goes through distinct periods, starting off with an ‘irruption’ phase during which the innovations are generated, followed by a phase of ‘frenzy’ as investors rush for a stake in the businesses spawned by the innovations. After this crowding-in of investments in search of capital gains triggers a bubble and associated financial crisis (devaluation), the state steps in to reorganise institutions to absorb the new technologies, leading to a phase of ‘synergy’ during which there is a generalised global dispersion of production systems across the economy as a new ‘golden age’ (of steady growth and long-term profitability from dividends rather than capital gains) sets in. The transition ends with a ‘mature’ phase during which the new technologies reach saturation point and production systems are stabilised with diminishing returns on investment.

Significantly, the financial crisis in each case is followed by massive state interventions aimed at managing the crisis, but also to fundamentally restructure the institutional and moral orders of society to prepare the way for the mass deployment of the new technologies and production.
systems. As power shifts from financial capital that drove the installation phase, to productive capital that drives the deployment stage, innovations get embedded in newly structured regimes of accumulation and governance, that are often seen as the ‘golden ages’ that follow the crisis period as solutions are introduced to ‘resolve’ the problems that are seen to be causes of the crisis. Without new roles for the state and the establishment of a new set of institutions, such a transition would be impossible. Although in each case the ideological language of interventionism was different (‘Keynesianism’ after 1920 and ‘free-market economics’ in the 1980s), the goals and modalities of the interventions were similar.

The obvious question, therefore, is whether the analytical framework developed by Perez helps us to understand the global economic crisis that began with the sub-prime financial crisis in the USA in 2007. What makes this a tricky question is that the ‘Information Age’ has, in fact, experienced what Perez has called a ‘double bubble’ – the so-called ‘dot com’ bubble of 1997–2000, followed by the financial bubble of 2004–2007. Perez has argued that these ‘two bubbles of the turn of the century are two stages of the same phenomenon’ (Perez 2009:780). She argues against the Keynesian argument that explains the financial crisis as a ‘Minsky moment’ in terms of which debt markets have an in-built tendency towards financial instability, which can only be mitigated by increased state spending (Krugman 2012). Instead, she argues that the most significant crises are triggered by the financial opportunities created by new technologies that result in ‘major technology bubbles (MTBs)’ that eventually burst. This is what the Internet mania of 1997–2000 was all about. However, instead of a deep economic recession that would have necessitated extensive state intervention to prepare the way for productive capital to take over from financial capital after the bubble burst in 2000/01, the post-crisis recession was mitigated by the rapid financialisation of the global economy that deregulation combined with the IT revolution made possible. Accessing Chinese exports not only brought down the cost of mass consumer goods (which effectively raised real wages), it also became the world’s largest lender of cash to developed world consumers via the purchase of massive quantities of US Treasury bonds. Indeed, the preference for liquid assets and quick operations within the paper economy that this created skyrocketed capital gains between 1996 and 2000, while profits in the real economy remained flat (Perez 2009:787). After the ‘dot com’ crash, instead of interventions to restrain financial capital, the opposite happened as various interventions by the Federal Reserve and neoliberal governments around the world effectively allowed the paper economy to mushroom into a gigantic unregulated global casino (Gowan 2009). The resulting bubble was not, according to Perez, another MTB, but rather a Ponzi-type ‘easy liquidity bubble (ELB)’ driven by massive concentrations of investments in paper assets (or what Warren Buffet famously called ‘financial weapons of mass destruction’) that eventually lost their value in 2007–2009 (Perez 2009).

Striking a possibly over-optimistic note, Perez wrote in 2009:

“What came after the internet bubble was not the restructuring of the real economy that tends to occur in the aftermath but a casino revival that only fulfilled part of that task. There can be, however, little doubt that this second major bust and its consequences are likely to follow the script and facilitate the necessary institutional recomposition to unleash the deployment period of the current surge.” (Perez 2009:800)

While pointing out that a spate of mergers and acquisitions brought on by the crisis has put in place the conditions for productive capital to take the lead, Perez admits that this time round it will not be easy to discipline financial capital. The Stiglitz Report has described, in practical terms, what it might take to restructure the global financial system in order to prepare the way for the re-emergence of the ‘real economy’ as the centre of global economic gravity (Stiglitz 2010). However, by 2012 there was little evidence of fundamental restructuring of the global financial system. Instead, the evidence suggests an interregnum between the old, which has not died and the new waiting to be born: we have the rivalry between China and the USA about the value of the Chinese currency; the ongoing
financial instabilities in the EU, exacerbated by the multiple sovereign debt crises; the de facto bankruptcy of the USA; the relatively unfettered flow of speculative finance through global markets despite the Dodd-Frank regulatory reforms of 2012; the hoarding of cash as investors wait for short-term capital gains opportunities to return, instead of looking for long-term productive investments in the real economy; and national governments who, having experienced massive devaluations in the past, continue to build up currency reserves to counteract financial shocks, thus keeping much-needed investment capital away from productive investment.

To make the links between the socio-technical cycles that Perez has identified and long-term economic growth waves, we turn to the work of UNCTAD economist Charles Gore. He has located the socio-technical cycles described by Perez within the Kondratiev-like ‘global development cycle’ that took off in the 1950s and ended with the global economic contraction of 2009. For Gore, a Kondratiev cycle cannot be equated to a technological cycle. While technological cycles follow the typical S-curve used by the MLP and Perez of irruption-crisis-deployment (Figure B below), as Figure A suggests the global economic development cycles adhere to a very different logic: growth-plus-price-inflation during the spring-summer period ending in a stagflation crisis; followed by another growth-without-much-inflation during the autumn-winter period ending in deflationary depression.

![Diagram of socio-technical cycles](image-url)

**Figure 2.** The synchronisation of growth cycles, price cycles and the life-cycles of technological revolutions (A) Growth cycles and price cycles in the Kondratiev long wave (based on USA); (B) The life cycle of technological revolution. *Source:* Based on Berry, 1991, figure 51; and Perez, 2007, figure 3.
As Gore points out, the post-World War II, long-term development cycle (1950s–2009) does not correspond to the socio-technological cycles that Perez describes. Although Perez tried to link technological cycles to economic growth, in her later work she gave up this effort. Gore has completed the picture. His first key insight is that the post-1970s growth phase was driven both by the deployment phase of the 4th cycle or Age of Oil (‘Revolution A’ in Figure xx) and the installation phase of the fifth cycle or Information Age (‘Revolution B’ in Figure xx), with the mid-point crisis of the fifth cycle marking the break between the post-WWII Kondratiev cycle and the next Kondratiev cycle. His second key insight, then, is that it follows that the next Kondratiev cycle will again be driven by two technological cycles – the deployment phase of the Information Age (fifth cycle) and the installation of the 6th cycle which may be over-determined by technologies that address climate change, rising resource prices and the consequences of eco-system breakdown.

If we combine the perspectives from Gore, Perez and the GER/UNWESS/IRP/McKinsey Reports, the result is a synthesis captured in summary form in Table XX. As per rows 1, 2, 3, 7 and 8 the first phase of the post—WWII long-term development cycle comprised a ‘spring’ of accelerated growth (1950s/60s) followed by a ‘summer’ of growth deceleration that ended in a stagflation crisis (1970s); while the second phase consisted of an ‘autumn’ of another growth acceleration (1980s/90s) followed by a ‘winter’ of contraction that began with the technology and liquidity bubbles of the 2000s. The full Kondratiev-type cycle runs from ‘spring’ through to ‘winter’ - a growth-crisis-growth-crisis pattern that typically lasts 50–60 years and is common to all five previous Kondratiev cycles.

Gore notes that the ‘spring/summer’ period of all Kondratiev cycles tends to be dominated by heavy investments in new long-term communications, transport and energy infrastructures that manifest the technologies of the time (steam and printing in the c.19th, electricity and the combustion engine in the c.20th, and the internet and renewable energy grids in the c.21st). Indeed, the mid-cycle stagflation crisis is often caused by over-investments in these infrastructures relative to the value of the economic output of the economy that takes time to catch up (similar to a kind of ‘supercycle’ as conceived by Motianey 2010). The next Kondratiev cycle (Row 6) — or, rather, the next long-term development cycle that should follow the current crisis — is unlikely to be much different, hence the importance of tracking (following Rifkin 2011) current and future investment flows into the new internet-based communications and (potentially decentralised) renewable energy infrastructures, and the investment flows into resource productivity (following McKinsey Global Institute 2011; Von Weizsacker et al 2009). The kinds of infrastructures that become the focus of mainstream investment flows will provide clues to the nature and dynamics of the next long-term development cycle.

For both Gore and Perez, if the information technology revolution is to proceed through to the ‘synergy’ and ‘maturity’ phases (Row 5, last 2 columns), the socio-institutional order still rooted in the Oil Age and associated with out-dated technologies on which it depends will need to be dislodged and replaced. However, for Gore it is not only information and communication technologies which could potentially “carry” the next Kondratiev cycle but also new renewable sources of energy and the deployment of a low-carbon economy (Gore 2010:725). In other words, the problem is not just institutional blockages for the information revolution (as argued by the institutional economists), but deeper resource constraints that could undermine the initiation of the next long-term development cycle as argued by the ecological economists (Rows 9&10).

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6. It is worth noting
Table XX: The global development cycle, 1950s–2030s

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<tbody>
<tr>
<td>1</td>
<td>Phase of Kondratieff cycle (Gore)</td>
<td>&lt;-Spring-&gt;</td>
<td>summer</td>
<td>&lt;-autumn- -&gt;</td>
<td>winter</td>
<td>&lt;-Spring ?-&gt;</td>
<td>summer</td>
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<td>2</td>
<td>Price cycle</td>
<td>rising price inflation</td>
<td>falling price inflation</td>
<td>rising price inflation (driven by rising resource prices, debt devaluation &amp; capital demand/interest rates</td>
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<td>3</td>
<td>Growth cycle</td>
<td>growth acceleration</td>
<td>growth deceleration</td>
<td>growth acceleration</td>
<td>growth deceleration</td>
<td>stagnation</td>
<td>growth acceleration, beginnings of deceleration from late 2030s?</td>
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<td>4</td>
<td>4th industrial transition (Perez)</td>
<td>deployment phase</td>
<td>maturity, but persistence of Oil Age socio-technical regimes</td>
<td>decline?</td>
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<td>5</td>
<td>5th industrial transition (Perez)</td>
<td>irruption</td>
<td>frenzy</td>
<td>crisis</td>
<td>synergy</td>
<td>maturity</td>
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<td>6</td>
<td>6th industrial transition (Perez)</td>
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<td>7</td>
<td>Nature of financial crisis</td>
<td>stagflation crisis</td>
<td>from 2007: deflationary crisis</td>
<td>start of stagflation crisis from late 2030s?</td>
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<td>8</td>
<td>Pattern of economic development</td>
<td>equalising (welfarism, Keynesianism, actually existing socialism, decolonisation)</td>
<td>unequilising (globalisation, privatisation, deregulation, markets)</td>
<td>equalising? (rise of the BRICs, return of Keynesianism, developmental states, etc)</td>
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<td>9</td>
<td>Resource flows (Fischer-Kowalski &amp; Swilling)</td>
<td>mainly biomass, 10-20bt/yr</td>
<td>doubling of non-biomass materials, 20-30bt/yr</td>
<td>non-biomass materials become dominant, increase to 50bt/yr</td>
<td>two thirds non-biomass, 60bt/yr, relative decoupling</td>
<td>relative &amp; absolute resource reduction?</td>
<td>absolute resource reduction?</td>
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<td>10</td>
<td>Resource prices (IRP/McKinsey)</td>
<td>declining resource prices</td>
<td>rising resource prices</td>
<td>stable/declining resource prices</td>
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<td>11</td>
<td>Socio-ecological regime (Fischer-Kowalski)</td>
<td>industrial socio-ecological regime</td>
<td>(transition to) sustainable socio-ecological regime</td>
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Gore’s argument provides the connection we need between macro-economic growth cycles, socio-technical cycles as described by Perez and the discussions reviewed in this paper about transition to a more sustainable or green economy as anticipated by the GER and UNWESS Report. If Gore’s application of Kondratiev cycles to the current crisis is correct, it means that the spring/summer period of the next (post-2009) long-term development cycle will need to be powered by the deployment phase of the Information Age (fifth industrial transition in Perez’s terms) and the socio-technical imperatives of the transition to a green or more sustainable global economy (6th wave). But this is by no means inevitable. In her recent work Perez is concerned about the logics of the global financial system that could block the shift in power from finance to productive capital that is the defining feature of a successful transition (Perez 2009). The persistence of austerity suggests that finance capital has not been dislodged. At the same time, the interests of the global energy complex are already blocking the transition to a low-carbon economy by defending their right to subsidies that are now running well over the $1 trillion mark. It therefore follows that the next long-term development cycle will only emerge when ways are found to reconcile the rapidly evolving information technologies that are moving into a deployment phase in the social and real economies (following Perez 2010b; Rifkin 2011), the sustainable use of resources to counteract rising resource prices (following Bradfield-Moody & Nogrady 2010; McKinsey Global Institute 2011; Von Weizsacker et al 2009), and a set of institutional and financial arrangements that make it possible to deploy the expanding amount of unspent investment capital on the best long-term needs of the economy, society and the environment (following United Nations Environment Programme 2011; Zhengelis 2012).

Can Africa Transcend the Resource Curse?

Many African countries are resource-rich resource-exporting countries that face the twin challenges of inequality and widespread poverty. However, rising resource prices are paradoxical: they can drive innovation in countries that import resources (Europe, for example, see European Commission 2011), while rising revenues can increase dependence on resource extraction in countries that are the resource exporters. This reinforces the argument proposed by Allianz that developed countries (most of whom are resource importers) may well become the centres for innovation for the 6th Kondratiev cycle. Over the long run, this could end up reinforcing global knowledge inequalities at exactly the time when the opposite should be happening.

Two recent volumes by mainly African researchers have raised critical questions about the implications of changed and escalated involvement in Africa by the world’s major economic powers (Ampiah & Naidu 2008; Southall & Melber 2009). In his comprehensive introduction to one of these volumes, Southall captures a consensus view when he notes that ‘[t]he thrust of the new scramble is to systematise the exploitation of Africa’s natural resources and markets’ (Southall 2009:20). However, the new scramble is different from the old scramble for Africa: what has changed is that there is a new global configuration of economic and political power; what has not changed is the fact that Africa remains a resource exporter and importer of capital goods and consumables (Southall 2009).

At the same time there is a new wave of optimism sweeping across Africa as growth rates climb, consumer spending rises and returns on investment are higher than in most other parts of the world since the onset of the economic recession in 2007. By 2008 Africa’s collective GDP was US$1.6
trillion, roughly equal to Brazil’s and to Russia’s. Real GDP has increased by 4.9 per cent per annum since 2000, more than twice what it was in the 1980s and 1990s. During the decade 2000-2010 Angola’s economy grew faster than any other economy in the world. Although these levels of growth are not uniform across all of Africa’s sub-regions, at current growth rates, GDP by 2020 is projected to be US$2.6 trillion underpinned by a rapidly urbanising youthful and increasingly educated population, with over 128 million households expected to be moving into the middle class to become vibrant consumer spenders (McKinsey Global Institute 2010). According to the African Development Bank’s 2010 African Economic Outlook Report released in May 2010 (African Development Bank 2010), the average 6 per cent growth rate for 2006–2008 dropped to 2.5 per cent in 2009. However, the report was optimistic that growth would rebound to 4.5 per cent in 2010 and 5.2 per cent in 2011 due to sound macroeconomic policies, counter-cyclical interventions, sustained aid flows and increased international loans. In reality, it was continued strong demand, despite the economic recession, for primary resources from other fast industrialising Asian countries (in particular China, but also India and Russia) that has been significant in protecting Africa from steep declines in GDP growth rates.

Although the boom in resource prices has clearly been a dominant driver of African economic growth, it would be a mistake to assume that other economic sectors remained stagnant. In reality, growth was spread across a number of sectors with resources reduced to 24 per cent of Africa’s total GDP by 2009 (McKinsey Global Institute 2010: 3).

The McKinsey Global Institute has clustered Africa’s economies into four distinct clusters (see Figure XX). The ‘diversified economies’ (Egypt, Morocco, South Africa and Tunisia) are Africa’s ‘growth engines’ having significant manufacturing and service industries. These economies are characterised by growth in the service sectors, rapid urbanisation and growth in consumer spending of between 3–5 per cent. The ‘oil exporters’ have the highest GDP per capita, but they have the least diversified economies. Their key challenge is to ensure that oil wealth is reinvested in education and infrastructure as a basis for more diversified growth. The ‘transition economies’ such as Ghana, Kenya and Senegal have lower GDP per capita than the diversified economies and oil exporters, but they are growing steadily as they gradually diversify and benefit from intra-African regional trade. The ‘pre-transition economies’ are very poor but are growing rapidly, albeit in unstable ways. Much will depend on whether they can get the ‘basics’ in place, such as stable governments, macroeconomic stabilisation, and reliable food production (McKinsey Global Institute 2010:5-6).
The optimistic picture painted by the McKinsey report under-emphasises the significance of the fact that primary resources still make up 80 per cent of Africa’s exports (which is the highest compared to all other regions). Furthermore, it ignores research by Paul Collier which shows that resource-dependent growth tends to stimulate short-run growth, but undermines long-term growth because there are limited incentives to diversify into sectors that could stimulate higher rates of growth (Collier 2010:1105). Future growth and development, therefore, will depend on whether resource rents are in fact reinvested in education/human capital, infrastructure (in particular urban infrastructure) and the effective management of resource exploitation (including ensuring sales at high enough prices).

In 2000, the export of primary natural resources accounted for 86 per cent of all exports from Africa (Mayer & Fajarnes 2005:8). This was much higher than the rest of the world – the export of primary natural resources accounted for only 31 per cent of all exports from all developing countries in 2000 and 16 per cent of the exports from advanced industrial countries in the same year. According to the 2012 Report on Africa by the UN Conference on Trade and Development (UNCTAD), Africa is a net exporter of resources (United Nations Conference on Trade and Development 2012). Figure 2 shows that Domestic Material Extraction increased by 87% between 1980 and 2008 (from 2.8 billion tonnes to 5.3 billion tonnes). Figure 3 reveals that exports have increased from 400 million tonnes to over 700 million tonnes, with fossil fuels playing a dominant role.

**Figure XX: Domestic Material Extraction (billion tonnes), 1980-2008**

*Figure XX: Africa’s four clusters*

(Source: McKinsey Global Institute 2010:4)
Figure XX: Africa’s Physical Exports (million tonnes), 1980-2008

(Source: United Nations Conference on Trade and Development 2012)

Figure XX: Africa’s Physical Imports (million tonnes), 1980-2008

(Source: United Nations Conference on Trade and Development 2012)
It is clear from Figures XX-XX that Africa is a net exporter of non-renewable resources and a net importer of biomass. As far as fossil fuels are concerned, Africa exports 500 mt and imports 100 mt (mainly refined fuels). Africa exports 14.5 mt of biomass, and imports 95.8 mt (mainly cereals followed by biomass-products - mainly vegetable fats and oils, timber and sugar crops).

In a remarkable 2006 report entitled *Where is the Wealth of Nations?*, the World Bank estimated the ‘genuine savings’ of all countries by adjusting the national income and savings accounts by deducting the costs of resource depletion and pollution, and then adding investments in education (World Bank 2006). Resource depletion includes the gradual depletion over time of natural assets, which include forests, mineral reserves, and energy resources (such as oil). Echoing the clusters described in the McKinsey report cited earlier, the countries that were the most dependent on exports of primary resources and lowest capital accumulation (measured in terms of ‘genuine savings’) included some of the largest resource exporters, namely Nigeria, Zambia, Mauritania, Gabon, Congo and South Africa. Indeed, the World Bank report shows that the more dependent an economy is on resource exports, the poorer it becomes over time if the full costs of resource depletion and pollution are taken into account. This, of course, is the end result of trade liberalisation over 20 years and structural adjustment. Contrary to the development strategies pursued by the successful Asian tigers over the same period, African Governments were forced to lift protective tariffs, thus killing off local industries that were unable to compete with the prices of imported goods. In the name of increasing trade, the opposite was achieved. According to Christian Aid, ‘[t]rade liberalisation has cost sub-Saharan Africa $272 billion over the past 20 years. Overall, local producers are selling less than they were before trade was liberalised’ (Christian Aid, 2005: 3).

In sum, the evidence suggests that rising rates of economic growth is related to increased revenues from resource exports. Although there is also evidence of diversification, this is clearly retarded by the disincentives created by the expanding pool of disposable resource rents. Fossil fuels (i.e. mainly crude oil) are Africa’s largest exports. At the same time it imports back onto the continent a substantial chunk of its refined fuel requirements points. This starkly reveals the consequences of insufficient oil refining infrastructure and the related skills sets.
Concluding what is the first review of Africa’s future economic prospects from a sustainable resource use perspective, UNCTAD argues that:

“[A]chieving sustainable development in Africa requires deliberate, concerted and proactive measures [by the State] to promote structural transformation and the relative decoupling of natural resource use and environmental impact from the growth process” (United Nations Conference on Trade and Development 2012:131).

This is all very well, but it ignores the consequences of the ‘resource curse’ (Sachs & Warner 2001). Paul Collier’s classic and highly influential elaboration of the original resource curse thesis is as follows:

‘[T]he political systems best suited to harnessing natural assets are those least likely to develop once natural assets have become important in the economy.’ (Collier 2010:1106)

This profoundly pessimistic conclusion is derived from econometric analyses that correlate the prevalence of national resource endowments with the state of governance capabilities. The evidence is compelling: the greater the resource endowment, the greater the probability of weak governance. Hence Collier’s influential conclusion. The obvious question this raises is whether Collier’s thesis is an ‘iron law’ of African governance, or whether there are ways out that may make it possible to envisage the inflow of resource rents as the funding source for diversification and the “structural transformation” envisaged by UNCTAD.

The usual practice when comparing Asian states to African states is to insist on what Mkandawire calls the “impossibility thesis” – what was achieved in Asia cannot be achieved in Africa (Mkandawire 2001). In their penetrating analysis, Rock et. al. conclude that “capitalist developmental states” that were built up in Asia to drive accelerated industrialisation from the 1970s onwards succeeded for two primary reasons: their “openness to the global economy as manifest in trade and investment policies”, and their successful efforts to build state systems “capable of creating the kinds of selection environments or socio-political landscapes for the development of more productive socio-technical regimes” (Rock et al 2009:246). They conclude that the institutional modalities of the capitalist developmental state in Asia are well suited to driving a sustainability transition, in particular the capacity to develop and implement long-term policy frameworks, regulatory and enforcement capabilities, the rapid incorporation into production systems of environmental standards required by external trading markets, and leadership abilities to forge knowledge partnerships that drive technological innovations (Rock et al 2009). These are clearly the same modalities that would need to be in place in African states to realise the structural transformation that UNCTAD has in mind.

Despite aspirations by the Ethiopian and South African states to emulate this model in recent years, only Botswana seems to have been able to sustain a long-term institution-building tradition. This does not mean such a tradition is absent in Africa, nor impossible. As Mkandawire shows, capable developmental states have existed in the past and drove successful economic development across many African countries during the 1960s and 1970s. However, the combined impact of rent-seeking and the application of neo-liberal prescriptions in Africa from the 1980s onwards not only resulted in minimising the role of the state in favour of the market, but unlike the Asian case it also involved the hollowing out of state capacity in the name of ‘civil service reform’, privatisation and deregulation. This prevented African states from building the institutional/ideational capacity and class
partnerships to take advantage of the global capital and knowledge flows unleashed by globalisation in the 1980s and 1990s (Mkandawire 2001). This now leaves them ill-equipped for the next transition.

The gradual reassembling of the African developmental state is reflected in the recent continent-wide discussion about ‘resource nationalism’. On the surface, the rise of ‘resource nationalism’ seems to signal that African states are, in fact, taking seriously the need to generate greater social returns on resource extraction. This was part of a global trend with 25 countries announcing their intention in 2011 to extract more profits from mining companies (The Economist 2012), many of which were African countries. According to Ernst and Young, 7 of the 10 largest mining deals that were concluded in 2011 were in Africa (cited in The Economist 2012). This suggests that much closer attention needs to be paid to the institutional micro-dynamics of resource governance before one can become too optimistic about the longer-term social benefits of ‘resource nationalism’. As demonstrated by Acemoglu & Robinson, the history of redistributive economic development over the past 250 years clearly shows that unless political elites make an explicit long-term commitment to replacing “extractive institutions” with strong “inclusive institutions”, resource rents will continue to be captured by elites while long-term development opportunities get squandered (Acemoglu & Robinson 2010).

Following Collier (Collier 2010), to counteract the damage inflicted on political governance systems by the kleptomaniacal flow of resource rents, three positive institutional interventions aimed at promoting what could be called ‘resource use integrity’ are worth noting. The first is the Kimberley Process which put in place a tracking system for diamonds which, in turn, has made it far more difficult to finance resource wars from the proceeds of blood diamonds. In 2008 the Nigerian President proposed a similar system for oil. The second is the establishment of Extractive Industries Transparency Initiative (http://eiti.org). Modelled on the success of Transparency International which tracks and exposes corruption, the EITI tracks resource extraction activities in order to place strategic information in the public domain so that it becomes more difficult for companies to cheat governments and rent seeking government officials find it more difficult to steal public funds. The third is the Sovereign Wealth Fund (SWF) idea similar to what Norway established to capture the benefits of North Sea oil. A Norwegian-funded aid programme to Angola is aimed at installing a similar structure for that country. Nigeria has similar plans. The underlying logic is that resource rents are ring-fenced so that they can be reinvested in socially beneficial projects. If successful, this kind of approach could demonstrate a way of reducing the corrupting effect of resource rents.

There are also various institutional interventions for improving the integrity of resource governance. The first of these involves replace secret negotiations with extractive industries with public auctions. This makes sure information remains in the public domain and restricts rent seeking behaviours. The second set of interventions must address the short-term calculations made by extractive industries and governments. Extractive industries working in unstable environments have an incentive to extract as much as possible as quickly as possible which, in turn, limits the long-term developmental benefits of this economic activity. Governments also have an interest in ensuring that as much as possible is extracted as quickly as possible because they want to minimize access to the resource rents by a rival political elite that could be elected at the next election. A SWF that can ring-fence resource rents might be one option, while the Nigerian Fiscal Responsibility Act or the South African approach to mandatory reinvestment of resource rents in economic activity after mine closures
might be other options. Another option might be the types of deals that the Chinese prefer, namely instead of paying royalties in the form of monetary payments they build infrastructures that (in theory) promote economic development. In such deals, resource rents are directly translated into public goods thus reducing the risk of rent seeking.

A third set of interventions should be aimed at creating the basis for broad-based civil society mobilisation underpinned by information. While the EITI tracks resource extraction activities, UNEP’s International Resource Panel (IRP) (http://www.unep.org/resourcepanel/) is steadily building up an understanding of global resource flows and why economic growth needs to be decoupled from rates of resource extraction. However, such initiatives are insufficient. They need to be coupled to normative initiatives such as the Natural Resource Charter movement that is spearheaded by an eminent group supported by renowned economists (see www.naturalresourcecharter.org). As this movement has gathered momentum, it has effectively set a new ‘gold standard’ for sustainable and accountable resource governance. As the crisis of resource depletion deepens and the social and economic costs of resource wars mount, there is a distinct possibility that the principles of the Natural Resource Charter could well become the basis for what will be needed at some point in the future – namely a global accord on how to best extract and use what is left. Like the UN Charter which emerged from two world wars, documents like the Natural Resource Charter are effectively humanity’s response to the devastating consequences of spreading resource wars which are, in turn, fuelled by steadily rising resource prices (see Chapter 7 of Swilling & Annecke 2012).

In summary, although the pessimism of the ‘impossibility thesis’ pervades much of the literature about Africa’s options, rising economic growth rates, accelerating diversification and recent references to ‘resource nationalism’ may well combine to provide opportunities for the kind of ‘structural transformation’ that the UNCTAD Report has called for. However, much will depend on whether ‘inclusive institutions’ get built that can ensure that Africa takes advantage of the next long-term development cycle. If state incapacity and destructive external policy interventions were the reasons why African economies failed to exploit the opportunities of the neo-liberal era in similarly opportunistic ways as many Asian economies, then to avoid a repeat of this missed opportunity clearly African states need to prepare themselves to take advantage of the next long-term development cycle. If the argument in this paper is correct, this will entail building up the knowledge capacities for sustainability-oriented innovations that could for once turn African resources into a blessing rather than a curse.

**Conclusion**

This paper started out by reviewing the stories of future landscapes encapsulated in a range of recent influential texts. Except for Motianey’s dystopian Grand Malaise, these texts all represent the transition to a post-global crisis future in terms of Kondratiev-type historical cycles that have occurred in the past and therefore are bound to repeat themselves. Significantly, they recognise - in weaker and stronger ways - that there are natural limits to long-term future economic growth and development trajectories. For Standard Chartered this is a minor irritation that will be overcome by innovations. For the others, these natural limits - especially resource depletion and rising resource prices - will become the primary catalysts for the next wave of sustainability-oriented innovations that will, in turn, transform the global economy. Indeed, they all in one way or another argue that this wave has already begun by referring to a wide range of niche-level innovations and even some
regime-level reforms. But they all call for greater urgency and more policy-level commitments to accelerating these processes. A recently released set of Reports seem to confirm these stories of future landscapes: the GER, UNWESS, IRP and McKinsey Reports all provide vast amounts of empirical and modelling-based evidence to directly or indirectly support the notion that the next Kondratiev cycle could indeed be coterminous with a transition to a ‘green economy’ if economic growth can in reality be reconciled with sustainable resource use and social inclusivity.

To conceptualise these apparently converging lines of argument about the dynamics of a global sustainability transition, it was necessary to factor in the challenge of institutional change and, in particular, the institutional implications of the information technology revolution for niche- and regime-level innovations. A synthesis was developed which suggested that the potential for a ‘sustainability-oriented transition’ during the ‘spring/summer’ phase of the next Kondratiev cycle certainly exists, especially if factors like resource depletion and rising resource prices are recognised. However, the length of the interregnum during the 2010s will depend to a large extent on whether a new generation of institutions could emerge that make possible a very different set of capital and resource flows to those that were reproduced by the globalised corporate and financial institutions built up during the course of the 19th and 20th centuries. These institutions (and the constellation of socio-technical regimes they entailed) managed unprecedented levels of material accumulation that benefitted a billion or so uber-consumers while externalising the costs of resource depletion, environmental degradation and GHG emissions. The shift in power from finance to productive capital will be a key marker that the interregnum is ending and the ‘5th wave’ is moving into its deployment phase; so too will be acceptance of the need for inflation to reduce the debilitating effects of the sovereign debts that ballooned after governments nationalised private banking debts after 2008. A policy regime to direct the growing mountains of un-invested cash into real-economy investments directly linked to the primary green economy goals would signal that financial capital and sustainability-oriented innovations had finally connected and converged to drive the installation period of the ‘6th wave’. The combined impact of the deployment phase of the 5th and the installation phase of the 6th waves could well accelerate the consolidation of a new generation of labour-absorbing socio-technical regimes generating significant returns on capital. Both waves, however, will be held back if the global institutional structure of financial and resource extractive power is left intact.

This then provides the contextual framework for taking a fresh look at Africa's prospects and options. Accelerating continent-wide growth is cause for optimism, especially as some African economies diversify beyond resource extraction regimes. But the ‘resource curse’ remains a challenge. Africa continues to be a net exporter of resources and the hollowing out of the state during the lost decades of the 1980s and 1990s ill-equips Africa for strategic redirection of resource rents into sustainable development. Unlike Asia, Africa did not emerge from the neo-liberal era with institutionally capable developmental states that can drive purposive long-term development strategies. An appropriate institutional mix still needs to be built up for this task by Africans themselves with, ideally, as little external meddling as possible. While the rise of resource nationalism should be welcomed, the real challenge is whether Africa will miss the next long-term development cycle like it did the second half of the last one; or whether it will find a role that allows it to benefit from both the deployment phase of the 5th wave and the installation phase of the 6th wave. While there is rapid progress in connecting African economies up to the information highway, the resource curse could reinforce Africa’s traditional role as a mere provider of cheap primary
materials. The best option for Africa would entail the re-investment of resource rents into the human capabilities, institutional capacities, infrastructures and eco-system services that will accelerate sustainability-innovations across the continent.
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