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From Credit Crunch to Planet Crunch - or Revival?

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Abstract

This is crunch time. The experiment with endless economic and ecological debt is ending in a 'planet crunch' of multiple converging shocks that threaten everyone. There have been decades of warnings so what went wrong? A global society of generally well-meaning and intelligent individuals has collectively not made a meaningful or intelligent response. As with the credit crunch, colossal accumulative risks are not prevented. Our minds trick us into trying to solve the planet crunch with the same thinking that caused it. Problems that are divided up to suit society's specialisms may appear more manageable yet if the problems are actually indivisibly joined-up then joined-up thinking and joined-up solutions are required. Systemic global problems require systemic global solutions designed with creativity and engagement rather than by reinforcing predetermined 'right answers'.

Planning to make global problems less bad has allowed them to worsen. Proposals for constraints (such as ending economic growth) and caps (such as limiting resource use and emissions) are proliferating. Yet global problems must be reversed, not just slowed, and the market mechanisms that cause them must be adjusted to do this, not shackled with centrally-planned restrictions. Recent research in the NATO Science Programme shows how systems thinking can be used to design systemic tools to make adjustments that match the scale and urgency of the problems. One proposed economic tool, 'precycling insurance', uses waste as a leverage point for a global revival of lasting wealth, stable productive ecosystems and co-operative societies. This tool provides an efficient growth-friendly market mechanism to swap the unaffordable worsening of planet crunch problems for affordable activities to reverse those problems. Today's resources-to-waste 'linear economy' can be switched to a resources-to-resources 'circular economy' in just a few years. Global self-destruction can be switched to global regeneration and revival.

Keywords: credit crunch, planet crunch, silo thinking, systems thinking, waste, climate change,

externalities, precycling insurance, circular economy, economic growth, revival.
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From Credit Crunch to Planet Crunch - or Revival?

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1. The 'Age of Stupid'

1.1 The 'credit crunch' of 2008-2009 marks the beginning of a period of escalating volatility throughout the global economy. The pattern of incentives that had prevailed can now be seen to have inflated a speculative bubble of intricate financial trickery. The bursting of this bubble has triggered the credit crunch where loans are scarce and investors lack secure opportunities. Economic activity is slowing worldwide, replacing irrational exuberance with irrational hesitation and domino-effect losses and hardships. However this is also a time of opportunity for rethinking economic assumptions and building a global revival based upon real lasting value.

1.2 Politicians are understandably desperate to see signs of economic recovery and have injected unprecedented doses of 'printed' and borrowed money into their national economies in the hope of resuscitating public and market confidence. Great faith is devoted to economic cycles and the expectation that however bad things become, a recovery must surely be on its way. Politicians are fond of pronouncing the 'strength of economic fundamentals' and of announcing public investments in conventional icons such as cars, roads and incinerators, in the forlorn hope of returning to growth-as-usual and the tax revenues to which they were accustomed.

1.3 More realistically, any hope of a fast recovery depends not on reinforcing the old ways, but in rigorously questioning them. Why was the world economy so dependent upon expanding credit? How can lasting wealth be created and not just another bubble of pretend wealth? What really are the fundamentals? Albert Einstein's advice remains relevant, "We can't solve problems by using the same kind of thinking we used when we created them." This indicates that the starting point for recovery of economic growth, and of all other critical global challenges, should be our habits of thinking.

1.4 A movie documentary was released in March 2009 called 'The Age of Stupid' (Armstrong, 2009), asking why humanity knew how climate change could make life unlivable and yet acted in ways that were entirely ineffective at solving it. More generally, how could societies including vast intelligent populations together act so stupidly? Nobody wishes to cause wealth to vanish, ecosystems to collapse or institutions to crumble. Nobody wishes their children to inherit a failing world. Individuals can be impressively smart but collectively, humanity takes on the problem-solving capacity of a herd of sheep. This paper sets out how our global society could instead respond with collective intelligence.

2. Less Bad is Not Good Enough

2.1 The essence of unsustainability is that, one way or another, it will end. Humanity has initiated a 'planet crunch' that combines unpredictable financial, ecological, security and social shocks. This already impacts everyone on Earth in different ways and the longer it continues, the greater the scale of irrecoverable shocks. Although a plethora of serious damage has been reported over recent decades, the planet crunch marks a period where economic activity runs into the 'economic inactivity' built up by all the damage. Today's complex troubled society is precariously fragile in the face of a barrage of foreseeable shocks.

2.2 Terms such as 'systems failure' and 'systemic crisis' may now be heard regularly in the media, having been unheard of previously. This marks the beginning of a turning point in society's herd intelligence. Policy-making is as stupid as its blindness about systems and as smart as its perception of systems. The underlying assumption has been that global problems are like mechanical problems - find which piece is broken and bring in specialists to fix it. This assumption is convenient for a specialised society and for specialised fields of knowledge but it is entirely

unfounded. Global problems are not neatly divisible into pieces and the experiment over recent decades of trying to manage global problems separately has conclusively solved nothing. A more reliable working assumption would be that global problems are an indivisible whole and solutions must be designed to work across them all on a planetary-scale.

2.3 Decades of persistent global problems have made it appear unrealistic to expect any global-scale problem to be reversed. The reversal of multiple problems appears even less realistic and consequently society has neglected to even try. Policy-makers have been content with planning for 'less-bad' rather than better since this is less challenging both psychologically and intellectually. However, less bad is not good enough. Incremental planning to cut waste has produced net increases in waste and incremental planning to cut emissions has produced net increases in emissions of greenhouse gases (GHG). The consequent continuing global loss of resources and rise in GHG concentrations is removing the potential for future wealth creation. Incrementalism is powerless to help and a new strategic approach to global problems is needed.

2.4 Everyone knows of organisations with a habit of silo thinking, of thinking in boxes, with staff who function well right up to the boundaries of their job descriptions but no further. Governments are infamous for compartmentalised silo thinking although the election of Barack Obama in the USA has set a popular expectation for all governments to get to grips with his ambitious rhetoric of global problem-solving. Silo thinking offers the illusion of managing complexity (by ignoring much of it) whereas joined-up or 'systems thinking' offers the possibility of actually managing complexity (by understanding it). Systems thinking discards the rigid boundaries of silo thinking, allowing innovative solutions that are vastly more ambitious and vastly more effective.

3. Learning to See Systems

3.1 There is a stereotype of white-coated systems scientists with high-powered computers and intricate drawings covered with feedback loops. These people no doubt can be found in their laboratories, yet in a time of upheaval systems thinking is a basic survival skill for everyone. We cannot tackle climate change without knowing the difference between stocks and flows (Sterman, 2007). Without understanding systems we remain stuck attempting solutions led by the same thinking that caused the problems. We remain stuck being surprised by predictable events, such as the credit crunch. We remain stuck enacting policies that respond to events rather than shape them. And we remain stuck in a flood of data without learning. Fortunately this scenario is optional.

3.2 Getting unstuck mentally is a change of mind and need not be a struggle. By contrast the mind that lacks flexibility is in a state of continual struggle that is expressed in real-life stresses and struggles. The incentive for encouraging creative thinking on a global scale could not be greater. There is the opportunity to sustain all life, including human civilization. There is the opportunity to achieve an economic and ecological revival of a scale and speed that today can hardly even be imagined. These opportunities are available globally by starting to use education's vast untapped potential to inspire critical creative thinking and engagement.

3.3 "Kids start out creative but we lose it at school" was a nine year-old girl's comment recorded during the author's recent work in the UK government's flagship creativity project for government-funded schools (Greyson, 2009). Habits of creative thought cannot be cultivated by assuming that inquisitive young minds must be moulded into established patterns of thinking. In modern centralised education, knowledge is chopped into lesson-sized chunks, pre-packaged and fed to children. Success is measured by children's acquiescence in first 'swallowing' and then 'bringing up' facts and skills when probed with tests.

3.4 George Bernard Shaw long ago paraphrased the switch that is available, "what we want to see is the child in pursuit of knowledge and not knowledge in pursuit of the child." Schools that have made this switch, such as Lewes New School (Kettles, 2009) simply allow learning to follow the curiosities of the class, which range freely across the entire curriculum and the possibilities of our time. As role models for the fascination of discovery, teachers guide and facilitate an endless

flow of learning. Children who experience this system get the same basic skills as other children, they get strong personal and social problem-solving skills, but they don't get pre-packaged thinking.

3.5 If education made this switch, society would be endorsing and instituting a culture of creativity and innovation. The quality of ideas would rise along with the quality of engagement in decision-making throughout society. Governments would find that emphasising engagement rather than control tackles disruptiveness both in the classroom and in society. The unquestioning acceptance of unstated assumptions and the herd thinking that caused the credit crunch and planet crunch would fall away. In the words of another primary school student reflecting on the author's sessions in their school, "I learnt that I could have big ideas".

4. Switching to a World That Works

4.1 The measurement of economic progress by growth in Gross Domestic Product has entranced politicians with a 'more is better' economy, where more spending on any manner of activity counted as progress. The speculative bubble of credit and asset values that preceded the credit crunch counted towards growth. Investments and spending that converted natural capital into dangerous wastes in the air, land and water counted towards growth. The rising costs of things going wrong counted towards growth, blessing politicians with a growth bonanza whatever they did. The underlying picture is of progress in reverse, with systematic losses of financial, societal and ecological stability. This instability is neither predictable nor safe for anyone.

4.2 The debt bubble propped up growth by borrowing from the future. The credit crunch has removed that prop so any serious hope of economic recovery rests with a 180 degree switch in the economic 'vehicle' to create lasting value instead of losing it. There is no point aiming for a 'less bad' economy since slower or even steady-state loss of value still cannot create any net value to underpin economic confidence. For example, there is no point aiming for lower emissions that would allow continuing rises in GHG concentrations that are already perilously high. There is no point aiming for lower rates of resource extraction and lower waste disposal, which would still destroy natural capital and still drain away tomorrow's economic potential.

4.3 Over the decades there have been calls to abandon the goal of economic growth and for markets to be constrained by centralised caps (or fixed limits) on resources and emissions (Jackson, 2009). In international climate negotiations, capping is the only option being considered and it is anticipated that economic growth will fall as caps are tightened. This flawed logic assumes that growth requires accumulation of waste and GHG, and ignores the vast opportunity for growth that doesn't require such accumulation. Talk about limits can reveal a scarcity mentality (that cannot imagine growth of natural capital and rising sustainable harvests) and unquestioning faith in big-brother central planning (that cannot imagine markets set up to reverse problems rather than cause them).

4.4 Growth is just a macro-economic adding-up exercise and faulty micro-economic decision-making cannot be corrected by limiting growth any more than an unhealthy diet can be corrected by limiting the grocery bill. Growth in material flows (a physical measure) is chained to growth in economic activity (a financial measure) by assumptions and patterns of incentives at the micro-level, in everyone's heads and in market mechanisms. Those who seek to limit material flows by limiting economic growth are adding to the confusion between physical and financial, between macro and micro. No-growth perpetuates the disempowering myth that growth and sustainability are incompatible (Lappé, 2009). No growth is no answer.

4.5 The 'economic fundamentals' (such as growth, unemployment and inflation) that politicians say are strong, are mere gauges on the dashboard of the economic vehicle. Growth says nothing about where we're being taken. The real fundamental of economics is where to go, and whether to attempt a net positive improvement to the global situation? This defines our role in the world and our prospects. Are we content with illusions of progress that mask ever more of humanity and its ecological habitat being abandoned in a desperate condition? Or can we imagine how the

economy could be set up to actually "make sure that the world we leave for our children is just a little bit better", as President Obama promises?

5. The Age of Revival

5.1 A switch from 'more is better' development to 'positive development' (Birkeland, 2008) would upgrade civilisation's responses to match the scale and urgency of the challenges. It would invite attention to the neglected stockpiles of financial debt (personal, corporate and national), ecological debt (such as lost nature and surplus concentrations of GHG) and social debt (such as overpopulation, surplus concentrations of weapons and surplus concentrations of wealth). It would replace mass illusions about progress with the prospect of the real thing. It would replace invented financial value with real lasting value built upon work towards growing resource stocks and growing expression of the common values of humanity.

5.2 Our future is being determined by a race between a planet crunch that is well underway, and a positive development revival that has not yet entered the public or political imagination. Our habits of thought trick us into considering just a portion of the planet crunch, just a portion of the solution and just a portion of the vast untapped opportunities. These habits invite an odd set of responses, united only in being ineffectual, such as denial, defeatism, plastic bag campaigns, more debt, resource incineration, armed conflict, restriction of civil liberties, carbon trading, corporate and government 'spin', and science-fiction geo-engineering. In the race against the planet crunch such responses are one step forward and two steps back.

5.3 The standard justification for ineffectual responses to global problems is the lack of alternatives when in fact effective alternatives may be found outside the silo of possibilities being considered. The problems and effective solutions are both far bigger than the convenient mental 'boxes' in which problems and solutions are examined. Research in the NATO Science Programme (Greyson, 2008) shows how systems thinking may be used to find policy 'switches' or leverage points able to reverse the planet crunch if used in time. The research includes a macro-economic switch (called 'Gross Peaceful Product') to turn global habits of conflict towards a culture of peace-building. The other proposed switch is presented below.

5.4 The scale of opportunity is conventionally assumed to be similar to the opportunities already achieved in resolving global problems, that is - not much. If it is observed that global problems have not been resolved only because they have been approached in ways that could never work, then a new era of opportunity is revealed. The opportunity inherent in all global problems is not to 'manage' them for improvement, but to reverse and eliminate them. By doing so, lifestyles and work with real purpose is created. Lasting wealth that is both generated and shared by all people is created. It's not rocket science, it's not impractical and it's not unappealing. If it is done people will wonder in future why was it neglected for so long?

6. The Waste-Making Economy

6.1 Modern industrial economies are waste-based; they generate large and growing flows of wastes that once were resources but now accumulate in ecosystems. The throw-away society is taken for granted as an economic fact-of-life, because all of us grew up with waste being taken for granted. It is so strongly associated with visions of stable economic growth and progressive lifestyles that policy-makers shudder to consider the economic apocalypse they imagine would follow any serious effort to prevent waste. Consequently both the public and policy-makers are typically unaware that waste-making is only one way to run an economy.

6.2 Policy-makers do not ask how to run an economy without accumulating unusable and toxic dispersed matter in the land, waters and the air. They do not ask how to stop making waste. Instead they ask how to get rid of the waste that is made. Waste is understood and defined in terms of disposal, so anything that is unwanted anywhere at any moment in time becomes waste. Waste is not understood ecologically (as elements of our shared Earth piling up as grit in the

machinery of life). Waste is not understood socially (as symbols of conspicuous consumption, alienation and deprivation). Waste is not understood economically (as prosperity squandered on things that become useless to nature and people).

6.3 It is not generally understood that the most widely discussed ecological issue of our time, climate change, is a waste issue. Climate change is just one symptomatic outcome of one element accumulating in one place, just one thread in a tapestry of life that is being unravelled on all sides as everything becomes waste. The dazzling highlight of misunderstanding both waste and climate is the worldwide rush to burn mixed waste. The Earth is a closed system for matter so incineration destroys scarce, often irreplaceable material value. In particular, carbon that could have been valuable as a solid is converted into GHG adding to atmospheric concentrations. Incineration excuses itself by sometimes recovering a small fraction of the energy needed to replace the destroyed resources. 'Landfill in the sky' reveals the departure of basic science, common-sense and public influence from waste decision-making.

6.4 Climate change and the majority of today's other planet crunch issues are tied to the systemic error of running a resource-destroying waste-making economy. The understanding needed to fix this was set out by the economist Kenneth Boulding four decades ago (Boulding, 1966). Had it been started then, the task would have been both simple and easy. Even now it is at least fairly simple. (The difficulty is handling the stockpiles of financial, ecological and social debt.) Boulding recognised the "reckless, exploitative and violent behaviour" associated with the mythical possibility of endless frontiers available to be claimed and fouled. He poetically called this the 'cowboy economy' although today it is commonly called the 'linear economy', to envisage a conveyor belt of resources becoming wastes (Leonard, 2008).

6.5 Modern waste management is incremental, ("how can we waste less?") end-of-pipe ("how can we get rid of all this junk?") and blind ("let's not even consider how to thrive economically without waste"). The basic planning tool for waste is the waste hierarchy, which is a sequence of priorities for using resources. According to the European Commission (EU, 2008), which invented the tool in 1975, first consider preventing waste then reusing then recycling (and composting) then recovery (usually disposal to air) and lastly disposal. Had it ever been used, this tool would have cut waste volumes and disposal would now be a minor activity. In practice it has been applied backwards and waste generation has spiralled. Firstly rely upon landfill, then support 'landfill in the sky' (disposal by burning), then (to the extent compatible with waste-burning contracts) consider recycling and composting, and lastly announce token waste prevention initiatives. Disposal to air, land and water continues because the planning and incentives provide for continuing disposal.

7. The Waste-Free Economy

7.1 The 'more is better' economy does not need to be stimulated to grow nor constrained from growing. It needs to be entirely replaced by 'positive development' in which markets work to automatically, systematically make things better both locally and globally. The folly of endless resources extraction, endlessly unmet human needs and endless waste dumping can end. Linear economics can be replaced by 'circular economics'. Boulding envisaged the economy taking part in a "cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy." This is not academic: China's 11th five year plan for 2006–2010 established a national goal of circular economics (Zhou, 2006).

7.2 Growth from trashing the planet was never a clever idea and linear economics has now reached the end of the line. The future for growth is circular economics where greater economic activity would mean a faster pace of change away from waste-making and towards looking after the world and all its inhabitants. A switch towards waste-free growth would preserve and regenerate material value and natural capital instead of losing it, so growth would work to build the physical basis for more growth. So long as this happens soon enough, there is no end-point; growth that preserves the resources on which it depends may expand with no theoretical limit to the monetary value of final services that can be produced from a given physical resource input

(Ayres, 1998).

7.3 In a circular economy profits, jobs and growth come not from extracting, moving, shaping, selling and dumping ever more resources, but from the work done and value created by handling resources with sufficient care that ecosystems and total natural resources actually expand, making it possible to meet human needs everywhere. There would still be unwanted materials to 'get rid of' but they would not end up accumulating in ecosystems, they would instead be regenerated as new resources for the Earth and for the economy. There are no material or non-material human needs that inherently require resources to be lost as wastes in ecosystems. The daunting gulf between the current waste-making economy and tomorrow's waste-free economy may be reimagined as a vast exciting source of work, jobs and growth.

7.4 The activities needed to switch from linear to circular economics include work on resources, such as doing more with less, cradle to cradle design, doing without accumulative toxics, local recycling and composting everywhere, and reversing the global loss of ecological productivity. Envisage taking the loose ends of the linear economy (extraction and dumping) and joining them together so the new circular economy gains a reliable feedstock of resources. Abundant energy, arriving free-of-charge from outside the biosphere would provide the thermodynamic input to run circular economics and the potential for regenerating existing accumulations of waste (such as GHG) into new biological and geological resources. Most of the perceived 'limits of nature' are limited only by linear economics.

7.5 The activities needed to switch to circular economics also include non-technical work to create suitable societal conditions such as inclusiveness, sharing and co-operation. A linear economy, with diminishing resources and prospects, inevitably invites alienation, hoarding and conflict – as if the game is for everyone to grab what they can while it lasts. A circular economy would not need to sell people things they don't need so radical shifts of culture are invited, such as social status defined by sharing rather than hoarding. Genuine hope for the future could cut urges to indulge in crime, corruption and cheating. Our innate human values of compassion could expand to include all people and all life, with massive economic benefits that are barely imaginable today.

8. The Pay As You Go Economy

8.1 The waste-making economy seeks a growth bonanza by omitting the price of dealing with waste from the price of products. The price of disposing of used products is paid by end-users and by public subsidies, or not paid at all in the case of illegal waste dumping. The price of using up resources is not paid, at least not until stocks decline, ecosystems become unproductive and supplies are interrupted. The price of ecological damage is not paid, at least not until pollution and dumped junk made lives less livable. The appalling price of things going wrong due to an exploitive rather than co-operative ethos is paid, but not counted as waste-related. The waste-making economy has now caused the planet crunch so the bonanza is becoming bankruptcy.

8.2 Omitting the price of dealing with waste from product prices gave only temporary economic growth. This simple error has been consistently missed because of the appeal of not paying for something compared to paying for it. However if the cost of not paying is the dismantling of everything needed for future growth and life on Earth then it would be cheaper to pay. This error has also been missed because of silo thinking that considered economic adjustments for singe issues but not multiple issues, particular problematic products (such as fossil fuels or plastic bags) but not all products, capping and taxes but not market-based mechanisms, and local or national adjustments but not global change. There are also unfounded assumptions that it would cost more to deal with waste up front, that adjustments to prices according to waste would be burdensome to work out, and that adjustments to prices involve just costs not pay-outs.

8.3 A new uncomplicated economic tool is available to switch from 'try not to pay' to 'pay as you go', from linear to circular economics, from 'more is better' to positive development, from causing climate change to reversing it, from dumping waste to dumping the idea of waste, from

unsustainable to sustainable development, and from economic collapse to revival. This tool internalises externalities efficiently within markets by paying the price of preventing problems, instead of the larger or unaffordable price of not preventing them. This tool, called precycling insurance, has been developed at the UK think-tank BlindSpot and peer-reviewed and published in both the Journal of Cleaner Production special issue on zero emissions (Greyson, 2007) and in a NATO Science Programme Advanced Research Workshop (Greyson, 2008). The NATO paper includes a further innovative economic tool to rapidly advance global and national security. Both papers are available from the author.

8.4 Precycling is the activity needed to create a resource 'cycling' or circular economy and to ensure that products don't keep adding to wastes in ecosystems. The 'pre' prefix emphasises that this cannot be arranged after something becomes waste; it must be done beforehand and any cost must be included in product prices so it is reflected in market decisions by buyers, sellers, producers and investors. Precycling insurance is an extension of the EU WEEE Directive's 'recycling insurance' (European Union, 2002) from just recycling to all forms of preventing products becoming waste. Significant producers would be obliged to understand the risk of their products ending up as waste in ecosystems and to insure against that risk. Producers would remain free to choose how to meet customers' needs without waste, and even free to continue making wasteful products, though they would be competing with other producers cutting their costs (including precycling insurance costs) by cutting their product's waste risk.

8.5 Unlike taxes, the premiums from precycling insurance would not be handled by governments; instead their role would be to legislate, monitor and ensure public transparency. Unlike conventional insurance, the premiums would not be collected up and then paid out following (potentially irrecoverable) planet crunch shocks. Premiums would be invested preventively, to cut the risk of resources being lost as wastes by supporting the dialogue, understanding, participation, capabilities, infrastructure and ecological productivity needed to regenerate used matter as new resources for people and for nature. Products, premiums and economic growth can all add real value. For the first time ever, it is now practical and achievable to unite sustainable development with economic development.

9. Precycling Insurance in Operation

9.1 Precycling insurance could correct much of the faulty pattern of incentives that is causing the planet crunch. All market participants (such as buyers, sellers, investors and government) would adapt their decisions to the corrected incentives. There would be no need to persuade people to 'do their bit' or 'do the right thing' since the incentives would speak louder than any campaign. Everyone would find that they were better off acting in ways that added up to economic, social and ecological revival. The appliance that breaks quickly and cannot be repaired or recycled would become more expensive than the appliance with a long warranty that is repairable and recyclable. Industries would find it profitable to meet customer needs with less (or no) physical product and to establish repair, reuse and recycling schemes for their product type. Biodegradable and safe substances would gain an advantage over bio-accumulative and toxic substances.

9.2 The material requirements of today's linear economy would rapidly shrink since the incentives provide a flow of durable and regenerated materials to replace most of today's extracted materials. Business would profit by serving people's actual needs rather than invented consumerist needs. The energy requirements of today's linear economy would rapidly shrink since a smaller material flow with higher quality materials closer to where they are needed requires less energy to process. For example, a factor 10 improvement in resource productivity would dampen energy requirements by up to 80%, putting renewables within easy reach world-wide and putting waste-making energy sources (such as new coal-fired plants, nuclear, food or forest-based biofuels and mixed-waste incineration) back on the shelf.

9.3 Entire economic sectors would use their established expertise to reinvent themselves as higher value-added industries; such as the disposal sector providing resource regeneration, the

energy sector providing renewables and energy conservation, the car sector providing electric, shared and public transport and the mining sector providing land regeneration and 'urban mining' of used goods. New economic sectors would be created to carry out the vital work that was neglected in the linear economy, such as the preservation and expansion of ecosystems, planned non-obsolescence, help for the vulnerable, open participatory problem-solving, and skill-sharing across neighbourhoods and nations. Unemployment would be uncommon. Planet crunch prices that are rising and volatile would be minimised and stabilised.

9.4 The size and economic burden of government has risen along with the myriad problems caused by linear economics. The Declaration of the 1972 United Nations Conference on the Human Environment transferred responsibility for global problems to governments for administration and planning. Since then, armies of civil servants and forests of regulatory red tape have resolved no global problems and it is not even clear that they have helped more than hindered. Precycling insurance is a form of global regulation that is set-up nationally but not centrally planned. Responsibility for preventing the problems caused by markets is retained by markets, allowing smaller cheaper government and vigorous innovative business. Progress is powered by the strength of markets instead of the 'strength' of controls on markets that exist largely in the realm of wordplay.

9.5 Precycling insurance could be implemented on similar timescales as the rapid international responses to the credit crunch. There is no other economic tool designed to tackle a range of planet crunch issues within markets and there is no other tool designed to tackle climate change whilst boosting economic growth. Busy legislators would be able to deal with many issues in a short span of time and the growth worries that have obstructed climate negotiations for decades would not apply. Those who are keen to revive economic growth and those who oppose the growth of physical resource flows should be able to unite in support of a solution that could achieve both aims if enacted globally in time. Precycling insurance may be expected to transform how we relate to each other and our shared world, how we invest our time and money in creating a secure prosperous future, how we discover big ideas beyond the confines of silo thinking, and how we match the speed of our collective responses to what's needed.

10. A Conclusion (or Continuation?)

Whether we can stop the planet crunch before it stops us depends upon the quality of our collective thinking about solutions. Thinking about problems without thinking about our thinking is futile. Policy-makers and the public have a common interest in solutions that encompass the entirety of the problems. Discussing the proposed systemic solutions would be a good start. Anyone, any business and any region can do this. This is crunch time for taking initiative for a rapid revival.

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