



Tipping Point: Near-Term Systemic Implications of a Peak in Global Oil Production -- Contexts and Implications

Posted by [Gail the Actuary](#) on April 26, 2010 - 10:44am

Topic: [Economics/Finance](#)

Tags: [david korowicz](#), [de-growth](#), [economic collapse](#), [economic growth](#), [globalised economy](#), [tipping point paper](#) [[list all tags](#)]

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We plan to post one additional section relating to adaptations for Wednesday evening's Campfire post, two days from now.

7. Contexts and Implications

7.1 The De-Growth Delusion

Over the decades as the evidence mounted that infinite growth was not possible in a finite world, the question was asked if we could live sustainably by reducing growth. It has been noted since Epicurus and the Buddha, and buttressed by modern studies that beyond a certain level of wealth, marginal increases do not make us more content. Why not live with less and share our surplus with the destitute? In general we don't do this, not by a long shot. Status anxiety, the sunk cost effect, personal/kin/tribal preferences and more ensure that the issue is far more complex in actuality.

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7. Contexts and Implications

In this section, we discuss why switching from growth to de-growth is much more difficult than it looks at first glance, some implications of the current analysis with respect to climate change, and how the financial crisis translates to a civilisational crisis.

7.1 The De-Growth Delusion

Over the decades as the evidence mounted that infinite growth was not possible in a finite world, the question was asked if we could live sustainably by reducing growth. It has been noted since Epicurus and the Buddha, and buttressed by modern studies that beyond a certain level of wealth, marginal increases do not make us more content. Why not live with less and share our surplus with the destitute? In general we don't do this, not by a long shot. Status anxiety, the sunk cost effect, personal/kin/tribal preferences and more ensure that the issue is far more complex in actuality.

More recently a number of authors addressed the issue of peak oil and recognised that economies must contract as oil availability declines[62][63]. Would it not be wiser to do a planned *de-growth* or *powerdown*, so as to avoid the worst economic shocks and ease the transition by moving in the direction in which the wind is blowing anyway?

These studies and arguments generally leave the energy-economy relationship unspecified, or assume the decline curve assumption. They have made suggestions including changing the debt based money system, pricing environmental externalities, reducing the working day, consuming less, controlling population, and increasing the lifetime of goods. In the context of the current financial crisis they often include some control on financial speculation.

So let us ask the question, could we do a managed de-growth, and what might it imply? In the dynamical systems perspective, could we find a stable or semi-stable path to a steady-state economy with much lower energy and resource flow throughput? The following reasons, in no particular order, suggest it is a vain hope:

We Can Turn on a Pin

We are close to, and may have already passed the peak of global oil production. We are in denial with no preparation; we have little time, torturous decision making structures, multiple competing interests, and live in a hyper-complex environment. We are locked into many welfare supporting structures. We are about to be hit by a full spectrum systemic crisis (in food security, mass unemployment, monetary system, global financial system, health, education, industry, security, public works, IT and communications.....). As this is far beyond what any government or civil society has ever anticipated and planned for, how can we be ready for it in the next year, maybe two?

Missing the Train

Once collapse begins we will lose the tools and infrastructure we would need to manage the collapse.

The Myth of Potency

We may look at our complex civilisation and say, '*We managed to reach this complex state, and if we did this, we surely can do almost anything.*' However we did not do this intentionally, with a plan that was executed; it is a self-organised system. The complexity is beyond our comprehension or ability to manage.

Control

Governments do not control their own economies; neither does civil society. The corporate or financial sectors do not control the economies within which they operate. The fact that these sectors can destroy the economy should not be taken as evidence that they can control it. (This

Lock-in

We are trapped in the current system. It has locked us into hyper-complex economic and social processes that are increasing our vulnerability, but which we are unable to alter without risking a collapse in those same welfare supporting structures. For example, our current just-in-time food system and agricultural practices are hugely risky. As the current economic crisis tightens, we are driving further efficiencies and economies of scale, particularly in food production, as deflation drives costs down. This helps maintain social peace and supports debt servicing, which supports our battered banks whose health must be preserved, or the bond market might not show up to a government auction. All of this makes it very difficult to do major surgery on our food production. There are countless examples of lock-in.

Uncertainty and Dynamical Chaos

Collapse breaks up the familiar stability of the processes we take for granted--the same processes which provide the framework by which we make judgements about the consequences of actions. The release of stored energy within the complexity of the global economy by collapse will make the prediction required for large scale control impossible to maintain.

Competing interests

Nationally and internationally we all hold different assets and liabilities (some carry deficits, some carry surpluses, some oil, some land, some have armies, and some think it's all a conspiracy). From a game theoretic view, there is no stable solution that would give a fair distribution of risks and reward for everyone. Initiating a managed withdrawal and instituting a new one, irrespective of complexity, would probably trigger a stampede.

Financial Feedback

We saw that one of our positive feedback processes was driven by market recognition of the problem. The more we do to prepare, the more we confirm the hypothesis, which itself drives the collapse.

Stop Consuming/ Green Consuming

If we consume less of the trivial, we may reduce energy flows, but this will lead to rising unemployment and reduced discretionary income. We have also noted that the trivial cross-subsidises the critical. So as the critical begins to decay, it will hamper our ability to manage the transition. We could mandate the redeployment of workers into new 'green' businesses (an upfront cost--are there sufficient credit lines available for this?), with limited ramp-up rates. This would of course cost more energy, just as energy supplies are declining.

Monetary Magic

It is relatively easy to conceive and introduce a local non-debt based money system. It is quite another to unweave the current system from the operational fabric, while keeping the operational fabric viable continuously so that people can be fed, employment maintained, the trade system operational etc.; never mind doing it in a way that lets creditors, debtors, pension funds, and petro-dollars find a happy accommodation.

Complementary currencies may be introduced, which may provide some support. It must be

born in mind that the great models of such currencies, particularly those introduced during the Great Depression, were built upon local economies that already had a significant local base of indigenous non-discretionary production. In our locally hollowed out economies, whose value and skill base is dependent upon globalised trade, little production is available to be traded whatever currencies are used.

7.2 Implications for Climate Change

The IPCC uses a number of scenarios based upon what they consider to be future growth trends to project future emissions of greenhouse gasses. These scenario families, A1, A2, B1 for example, all assume access to fossil fuels would not be a limiting factor on future emissions. A number of studies have recognised that the implications of peak oil, gas, and even coal on future emissions of greenhouse gas could alter the IPCC assumptions.

Kjell Aleklett has described the UN's future scenarios as “pure fantasy”[\[64\]](#). However, researchers have pointed out that even with peak oil, gas and coal emissions could still rise beyond what is regarded as safe. Kharecha and Hansen argue that without corrective measures, atmospheric CO₂ concentrations could still rise to 600ppm, while the safe level is 350ppm. This rise was mainly due to coal[\[65\]](#). Brecha also included oil, gas and coal, but modeled their availability in a more careful manner. He concluded that world energy production would peak between 2030 and 2050, with CO₂ concentrations stabilising between 480 and 580ppm[\[66\]](#). Nel and Cooper, referred to earlier, generated production profiles for the three fossil fuels, and find a peak occurring about 2025, and maximum concentrations of CO₂ are 550ppm.

This report takes serious issue with all these studies. Principally, it is because they rely upon the decline curve assumption, based on past patterns. They all effectively assume no or little coupling between declining energy flows through the global economy and the general operability of the economy. Included within this assumption is that there is no or weak coupling between different forms of fossil fuels. What the decline curve assumption gives to researchers are data sets of future emissions to put into climate models, but in our view, this decline curve assumption is wrong. It may be impossible to generate emissions data sets that properly reflect the much faster decline likely from a collapsing global economy.

Irrespective of any decisions by governments, greenhouse gas emissions from fossil fuel burning and cement manufacture are likely to undergo a significant collapse, as production and the operational fabric falls apart. In addition, the most carbon intensive sources of oil such as the tar sands are likely to cease to be viable as demand collapses, the purchasing power of customers drops way below the marginal cost of production, and energy infrastructure is lost to entropic decay.

Land based emissions may see various countervailing trends. A collapse in world trade may see emissions from fertilisers drop, and much reduced pressure on forests for the material resources for the global economy. However, the growth in demand for bio-fuels and food would increase greatly, but the ability to ramp up this trade would be compromised by the failing operational fabric. The outcome that seems more likely is a localised destruction of forests, and the tilling of pasture as people react to their own immediate shortages.

However, even with a collapse in emissions, lags in the climate system will ensure temperatures will continue to rise. Nor are we sure how close we are to crossing strong feedbacks in the climate system that could continue to drive total greenhouse gas emissions upward, even while anthropogenic emissions dropped. One way or another, we are likely to experience the growing

Few if any studies of the economic impact of climate change assume we will be very much poorer in the future. The physical effects of climate change in the form of flooding or food production are expected to amplify the effects of an energy induced systemic collapse. Being much poorer will mean that the relative costs of adaption or recovery from climate induced shocks and stresses will escalate beyond our ability to pay. There may not be the resources to repair homes and infrastructure damaged by flooding, say, or re-settling residents. Furthermore the support of insurance markets (dependent upon the financial markets) will not be there to help us manage those risks.

Many of the policy instruments being discussed to tackle climate change are likely to fall apart, even if instituted. Carbon caps and prices, the adaption fund, and technology transfer are all likely to flounder as economies and markets collapse, and as the most short-term concerns are given even more prominence than today.

7.3 From the Financial to the Civilisational Crisis

The processes described in this report have only touched on the current financial and economic stresses across the world. If the optimism of some commentators that the recession has bottomed-out is confirmed, then we can expect growth in energy demand to begin soon. Following on from that we can expect a return to rising energy and food prices and a resumption of an even more severe recession.

What seems more likely is that the risk of sovereign defaults will rise, as will growing volatility in the currency markets, and growing stress in government finances. Even without energy constraints, we could see further drops in energy demand and prices as economies fall deeper into recession.

Growing credit constraints, declining productivity and further stress on public finances in many developed countries will hamper our ability to invest in renewable energy and other mitigating measures. Energy companies will find it harder to finance new production and maintain existing infrastructure as costs rise, prices and exchange rates remain volatile, and credit is expensive.

Meanwhile discussion and actions regarding peak oil are likely to move participants along the curve of the final frenzy, which may begin to drive up the price of certain land and other real assets, and constrict credit further. There may be a rush to renewable energy infrastructure but its expansion will be limited by the state of the global economy and its limited ramp-up rates.

Either the economy begins to grow again, or economies with deflation or stagflation may find that their already low energy demand is hit by further declines in production and higher energy/food prices.

All of this provides the uncertain backdrop to the main theme, that the defining dynamic of our civilisation is the withdrawal of energy from a complex and integrated system adapted only to growing. And when we look back at the history of this time, the anxious fretting about euro-zone defaults, Chinese bubbles, and US deficits may well be seen as the thinnest of froth on a vast bubble bursting.

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