



Tipping Point: Near-Term Systemic Implications of a Peak in Global Oil Production - Part 1 - Summary

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Recently, a 55 page paper called [Tipping Point: Near-Term Implications of a Peak in Global Oil Production](#) (PDF warning) was published as the joint effort of two organizations:

Feasta, a leading international think-tank exploring the interactions between human welfare, the structure and operation of human systems, and the ecosystem which supports both, and,

The Risk/Resilience Network, an initiative which was established in order to understand energy induced systemic risk, the scope for risk management, and general and emergency planning.

This paper talks about the likely systemic impacts of peak oil, including the possibility of collapse. With a long publication such as this, it is difficult to know how to present a reasonable subset of the material. In this post, we are publishing the **Summary** as Part 1. Our tentative plan is to publish three additional excerpts from the paper later. Those who wish to read the paper now can download it from the link above.

The lead author of this publication is David Korowicz. You may remember him for his talk at the Oil Drum/ASPO Conference at Alkatraz, Italy last summer called [Things Fall Apart: Complexity, Supply Chains, Infrastructure & Collapse](#).

Tipping Point

Near-Term Systemic Implications of a Peak in Global Oil Production

An Outline Review

Summary

The credit crisis exemplifies society's difficulties in the timely management of risks outside our experience or immediate concerns, even when such risks are well signposted. We have passed or are close to passing the peak of global oil production. Our civilisation is structurally unstable to an energy withdrawal. There is a high probability that our integrated and globalised civilisation is on the cusp of a fast and near-term collapse.

As individuals, and as a social species we put up huge psychological defences to protect the status quo. *We've heard this doom prophesied for decades, all is still well! What about technology? Rising energy prices will bring more oil! We need a Green New Deal! We still have time! We're busy with a financial crisis! This is depressing! If this were important, everybody would be talking about it!*

Yet the evidence for such a scenario is as close to cast iron as any upon which policy is built: Oil production must peak; there is a growing probability that it has or will soon peak; energy flows and a functioning economy are by necessity highly correlated; our basic local needs have become dependent upon a hyper-complex, integrated, tightly-coupled global fabric of exchange; our primary infrastructure is dependent upon the operation of this fabric and global economies of scale; credit is the integral part of the fabric of our monetary, economic and trade systems; a credit market must collapse in a contracting economy, and so on.

We are living within dynamic processes. It matters little what technologies are in the pipeline, the potential of wind power in some choice location, or that the European Commission has a target; if a severe economic and structural collapse occurs before their enactment, then they may never be enacted.

Our primary question is what happens if there is a net decrease in energy flow through our civilisation? For it is absolutely dependent upon increasing flows of concentrated energy to evolve and grow, and to form and maintain its complex structures. The rules governing energy and its transformation, the laws of thermodynamics, are the inviolate framework through which all things happen- the evolution of the universe, the direction of time, life on earth, human development, the evolution of civilisation, and economic processes. This point is not rhetorical, access to increasing flows of concentrated energy, which can be transformed into work and dispersed energy, is the foundation upon which our civilisation stands. Yet we are at a point where these flows are, with high probability, about to begin decreasing. We should intuit that an energy withdrawal should have major systemic implications, for without energy flows nothing happens.

The key to understanding the implications of peak oil is to see it not just directly through its effect on transport, petrochemicals, or food say, but its systemic effects. A globalising, integrated and co-dependant economy has evolved with particular dynamics and embedded structures that have made our basic welfare dependent upon delocalised 'local' economies. 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. And without increasing energy flows, those embedded structures, which include our expectations, institutions and infrastructure that evolved and adapted in the expectation of further economic growth cannot be maintained.

In order to address these questions, the following paper considers the nature and evolution of this complex integrated globalised civilisation from which energy is being withdrawn. Some broad issues in thermodynamics, the energy-economy relationship, peak oil, and the limits of mitigation are reviewed. It is argued that assumptions about future oil production as held by some peak oil aware commentators are misleading. We draw on some concepts in systems dynamics and critical

The economics of peak oil are explicated using three indicative models: *linear decline*; *oscillating decline*; and *systemic collapse*. While these models are not to be considered as mutually exclusive, a case is made that our civilisation is close to a critical transition, or collapse. A series of integrated collapse mechanisms are described and are argued to be necessary. The principle driving mechanisms are re-enforcing (positive) feedbacks:

- A decline in energy flows will reduce global economic production; reduced global production will undermine our ability to produce, trade, and use energy; which will further decrease economic production.
- Credit forms the basis of our monetary system, and is the unifying embedded structure of the global economy. In a growing economy debt and interest can be repaid, in a declining economy not even the principle can be paid back. In other words, reduced energy flows cannot maintain the economic production to service debt. Real debt outstanding in the world is not repayable, new credit will almost vanish.
- Our localized needs and welfare have become ever-more dependent upon hyper-integrated globalised supply-chains. One pillar of their system-wide functioning is monetary confidence and bank intermediation. Money in our economies is backed by debt and holds no intrinsic value; deflation and hyper-inflation risks will make monetary stability impossible to maintain. In addition, the banking system as a whole must become insolvent as their assets (loans) cannot be realised, they are also at risk from failing infrastructure.
- A failure of this pillar will collapse world trade. Our 'local' globalised economies will fracture for there is virtually nothing produced in developed countries that can be considered truly indigenous. The more complex the systems and inputs we rely upon, the more globalised they are, and the more we are at risk from a complete systemic collapse.
- Another pillar is the operation of critical infrastructure (IT-telecoms/ electricity generation/ financial system/ transport/ water & sewage) which has become increasingly co-dependent where a systemic failure in one may cause cascading failure in the others. This infrastructure depends upon continual re-supply; embodies short lifetime components; complex highly resource intensive and specialized supply-chains; and large economies of scale. They also depend upon the operation of the monetary and financial system. These dependencies are likely to induce rapid growth in the risk of systemic failure.
- The high dependence of food on fossil fuel inputs, the delocalisation of food sourcing, and lean just-in-time inventories could lead to quickly evolving food insecurity risks even in the most developed countries. At issue is not just food production, but the ability to link surpluses to deficits, collapsed purchasing power, and the ability to monetize transactions.
- Peak oil is likely to force peak energy in general. The ability to bring on new energy production and maintain existing energy infrastructure is likely to be severely compromised. We may see massive demand and supply collapses with limited ability to re-boot.
- The above mechanisms are non-linear, mutually re-enforcing, and not exclusive.
- We argue that one of the principle initial drivers of the collapse process will be growing visible action about peak oil. It is expected that investors will attempt to extract themselves from 'virtual assets' such as bond, equities, and cash and convert them into 'real' assets before the

system collapses. But the nominal value of virtual assets vastly exceeds the real assets likely to be available. Confirmation of the peak oil idea (by official action), fear, and market decline will drive a positive feedback in financial markets.

- We outline the implications for climate change. A major collapse in greenhouse gas is expected, though may be impossible to quantitatively model. This may reduce the risks of severe climate change impacts. However the relative ability to cope with the impacts of climate change will be much lower [*orig. says greater*] as we will be much poorer with much reduced resilience.

This will evolve as a systemic crisis; as the integrated infrastructure of our civilisation breaks down. It will give rise to a multi-front predicament that will swamp governments' ability to manage. It is likely to lead to widespread disorientation, anxiety, severe welfare risks, and possible social breakdown. The report argues that a managed 'de-growth' is impossible.

We are at the cusp of rapid and severely disruptive changes. From now on the risk of entering a collapse must be considered significant and rising. The challenge is not about how we introduce energy infrastructure to maintain the viability of the systems we depend upon, rather it is how we deal with the consequences of not having the energy and other resources to maintain those same systems. Appeals towards localism, transition initiatives, organic food and renewable energy production, however laudable and necessary, are totally out of scale to what is approaching.

There is no solution, though there are some paths that are better and wiser than others. This is a societal issue, there is no 'other' to blame, but the responsibility belongs to us all. What we require is rapid emergency planning coupled with a plan for longer-term adaptation.



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