

# Global LUNCH BOX

What's in your lunch box?



**Lunchbox #1    The Three E's!**



Randy Udall - co-founder of [ASPO-USA](#), likens our situation to 20% of the world's population sitting around a giant bonfire piling on 1million tons of fossil fuels every hour. Draining an olympic size swimming pool of crude oil every 15 seconds. The remaining 80% watch from a distance whilst the fuel gauge heads towards zero.

Half of all the CO2 that humanity has put into the atmosphere has occurred since 1980.

When historians look back at our time it will be defined as a brief moment of 3-4 generations that lived during the fossil fuel age. Our cornucopian belief that we will always come up with a solution and that there are no limits has blinded us from the truth that we are squandering the Earth's resources and leaving little for future generations.



Energy is everything. No energy = No work. We know this when we are sick in bed or when the electricity goes out.

Before the era of fossil fuels humanity was constrained by the limited amounts of energy that could be harvested from nature. The energy available to us was our own muscle power, wood, oxen, small wind and hydro and even human slavery. This constraint acted like a governor on how productive we could be - in terms of how much food we could produce, how much housing we could build and how much infrastructure we could put in place.

The discovery of fossil fuels at the beginning of the industrial revolution lifted that constraint and fuelled the growth of everything we see today. The more energy we had the more productive we could be, and, the more productive we could be, the faster our economies could grow. Transport, trade, agriculture, population and even our financial institutions developed on the back of an ever increasing supply of fossil fuel energy. The industrial revolution was really an energy revolution that enabled us to break free from the limits of nature.

The civilisation we see today is as much a result of energy availability as a result of human ingenuity.



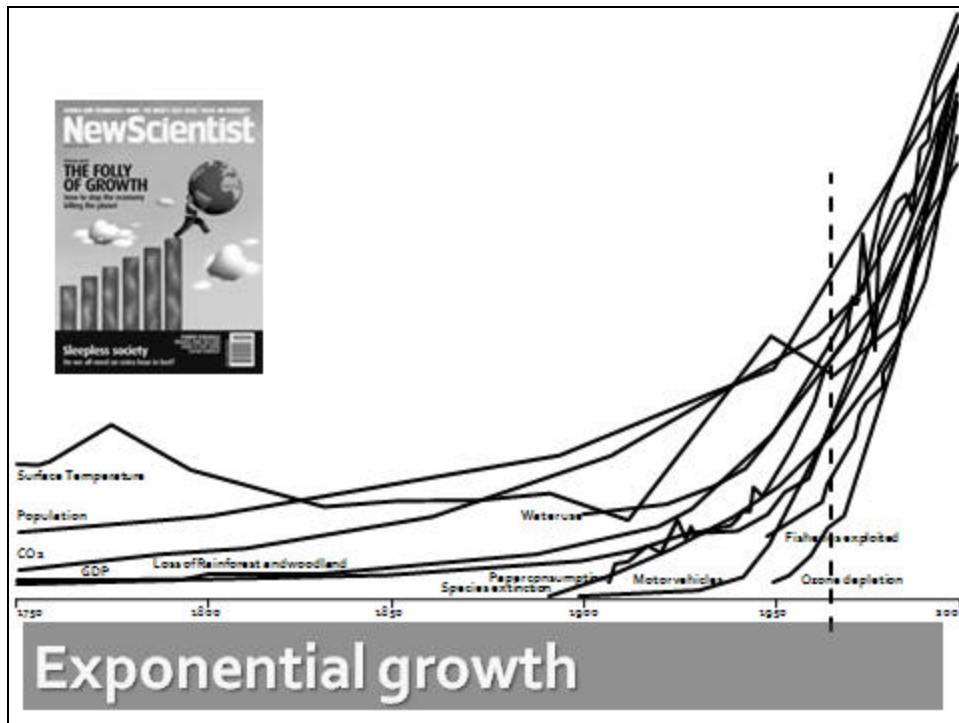
A traditional economists view is that the inputs to an economy are capital and labour and that the outputs are saleable goods and services. Resources and energy are viewed as secondary inputs, are in abundance and any limitations will be overcome by science and innovation.

Nobel prize winning economist, Robert Sollow, went so far as to say "the economy can in effect continue without the natural world".

But of course what is missing from the picture is that the economy is a subset of the environment. All energy comes ultimately from the sun which we avail of through the exploitation of wood, wind, water etc and of course fossil fuels, which is ancient sunlight energy trapped over geological time in the form of oil, coal and gas.

Our economy is in essence a materials and energy processing system. The earth's resources are transformed using high quality energy into goods and services and in the process waste is dispersed into the environment.

The economy is therefore subject to the laws of nature and there are limits to how much energy and resources that the earth can supply and how much waste it can consume.



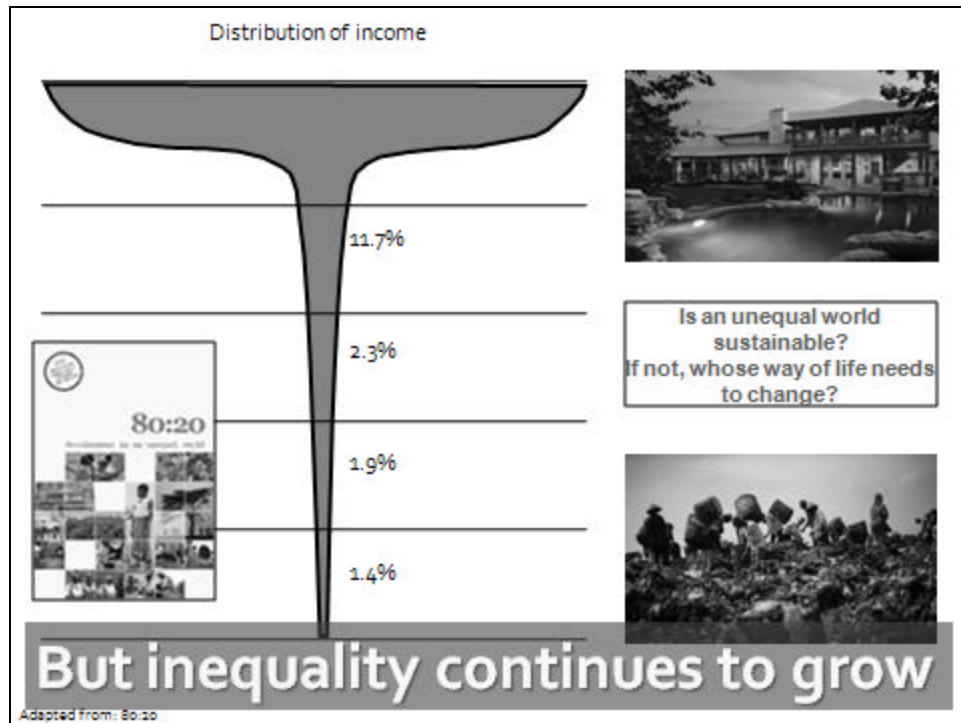
“How do we square Earth’s finite resources with the fact that as the economy grows, the amount of natural resources needed to sustain that activity must grow too? It has taken all of human history for the economy to reach its current size. On current trends it will take just two decades to double.”

In his article “What politicians dare not say” Tim Jackson of the UK Sustainable Development Commission explains the catch-22 situation we are in:

“Consuming less may be the single biggest thing you can do to save carbon emissions, and yet no one dares to mention it. Because if we did, it would threaten economic growth, the very thing that is causing the problem in the first place.”

But our economies grow exponentially year on year. This means that each year’s growth is bigger than the previous year’s growth. This means that each year’s demands upon energy, resources and the earth’s capacity to absorb waste also grow. It has taken all of humanity for the industrial economy to reach its present size, yet at a 3% growth rate the global economy would double in just over two decades. Consider twice the number of cars, televisions, houses, cities, motorways, airplanes and shipping.

Yet, the background acceptance of every continuing growth is never questioned. Investments in infrastructure, insurance, business expansion, savings and pensions are all framed within the assumption that the future will always be bigger than the past. Looking back over the last 100 years it is not difficult to understand this assumption because it has been our lifetime experience. We have become so used to growth that we see the growth curve we are on as essentially flat and the way things should be. Contrast this to life before fossil fuels when growth was imperceptible small, impossible to notice from generation to generation.

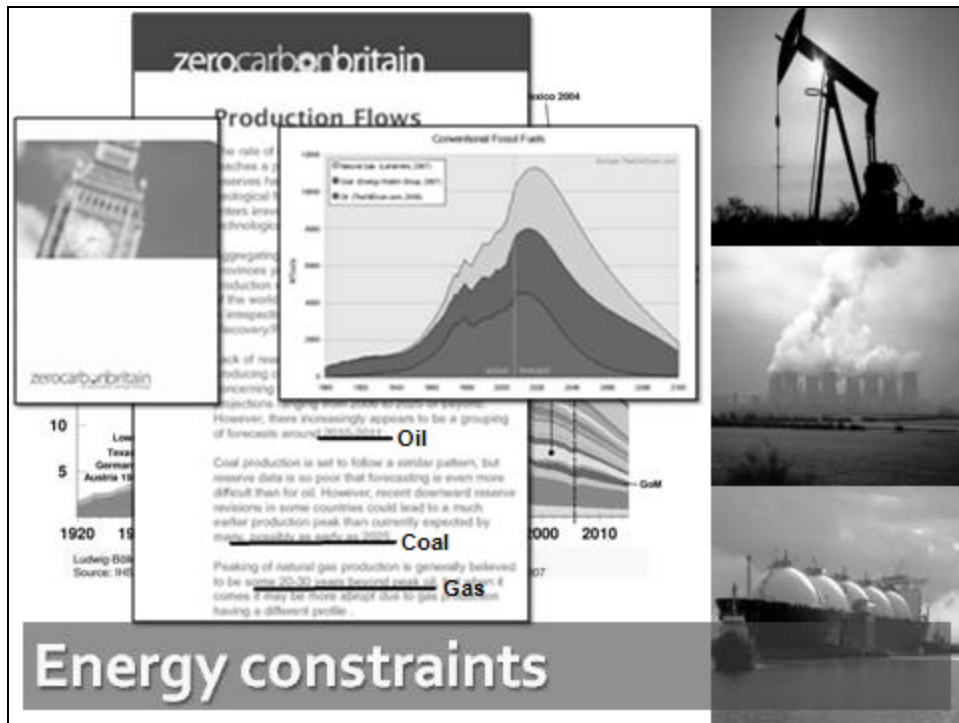


As humans we are predisposed to growth and the principle argument for growth is that the “trickle down” effect with “lift all boats” and that everyone will benefit. This has not happened. Wealth is being increasingly concentrated in the hands of the few both at home and abroad.

In 1960 the income of the richest 20% was 70 times that of the poorest 20%. In 1990 the income of the richest 20% was 140 times that of the poorest 20%. In 1980 for every \$100 added to the global economy \$2.20 was added to those below the poverty line, by 1990 that figure had shrunk to 60cents.

David Korten, author of *The Great Turning*, says “Our economic and political system has produced a credit meltdown, a shrinking middle class, escalating food and energy prices, a dramatic decline in U.S. Manufacturing, billion dollar pay packages for hedge fund managers, sky-rocketing consumer debt, an unstable US dollar and the spreading collapse of the earth’s environmental system. By any measure, our economic system has failed”.





The world was endowed with approximately 2 Trillion barrels of conventional crude oil, and, over the last seventy years we have consumed about half.

If we could continue at today's rate we would consume the second half in only 33 years!

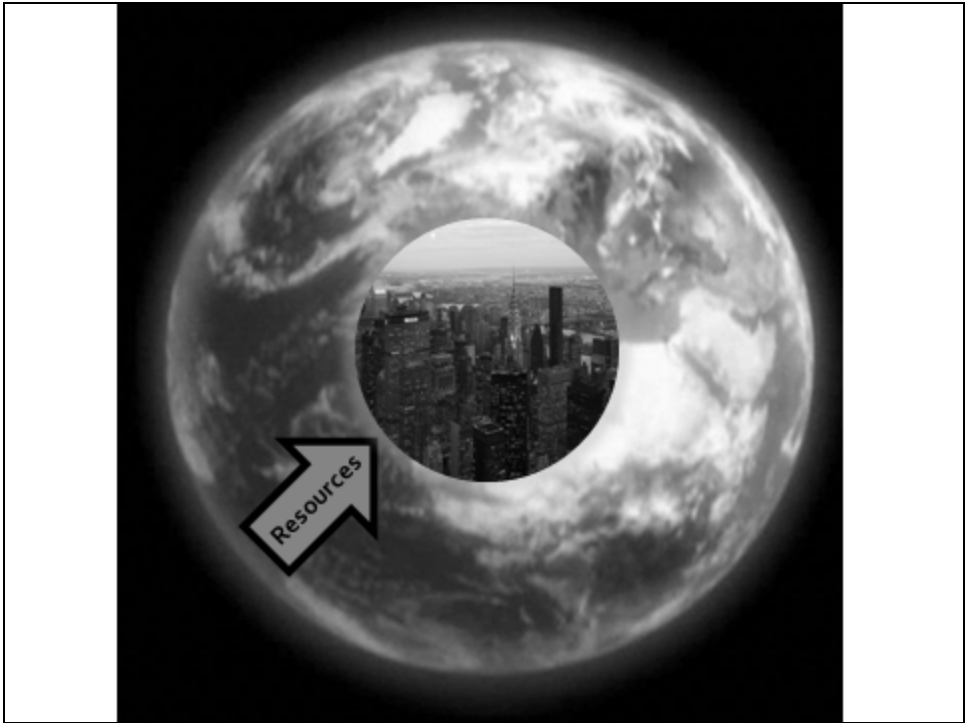
The problems, however, occur around about now at the halfway point when production reaches a maximum and then goes into a steady decline.

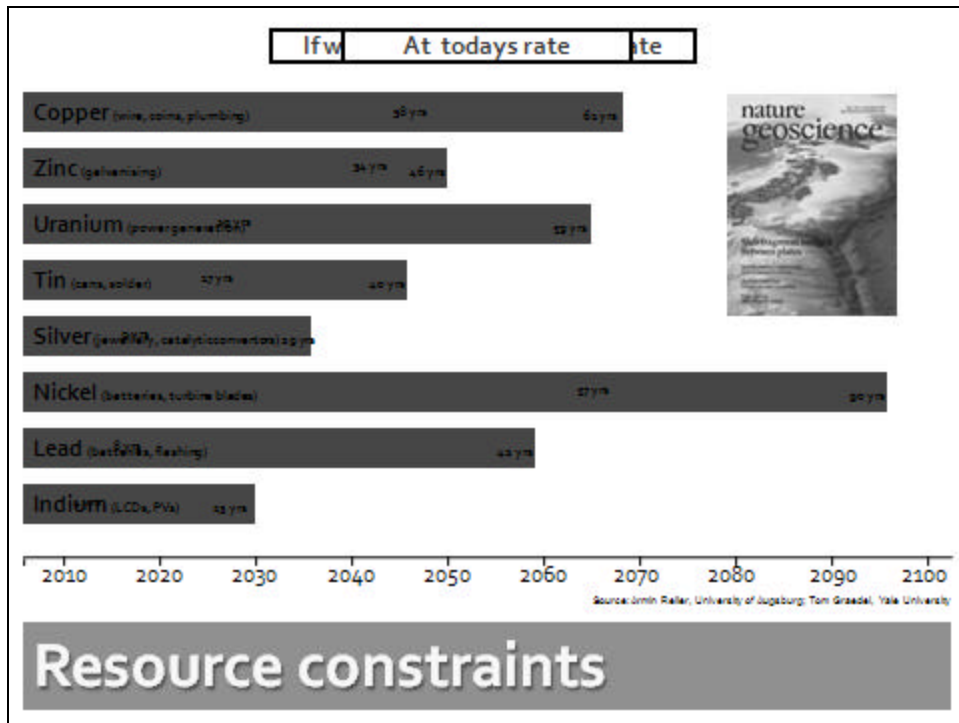
Given that many individual countries have already passed their peak of oil production it stands to reason that eventually the world will peak.

Many independent geologists and oil industry experts forecast a peak and subsequent decline somewhere around 2012. This will be followed by peak gas in 2025 and peak coal in 2030.

This will have a dramatic effect on a global economy that is dependent on an increasing supply of cheap energy in order to grow.







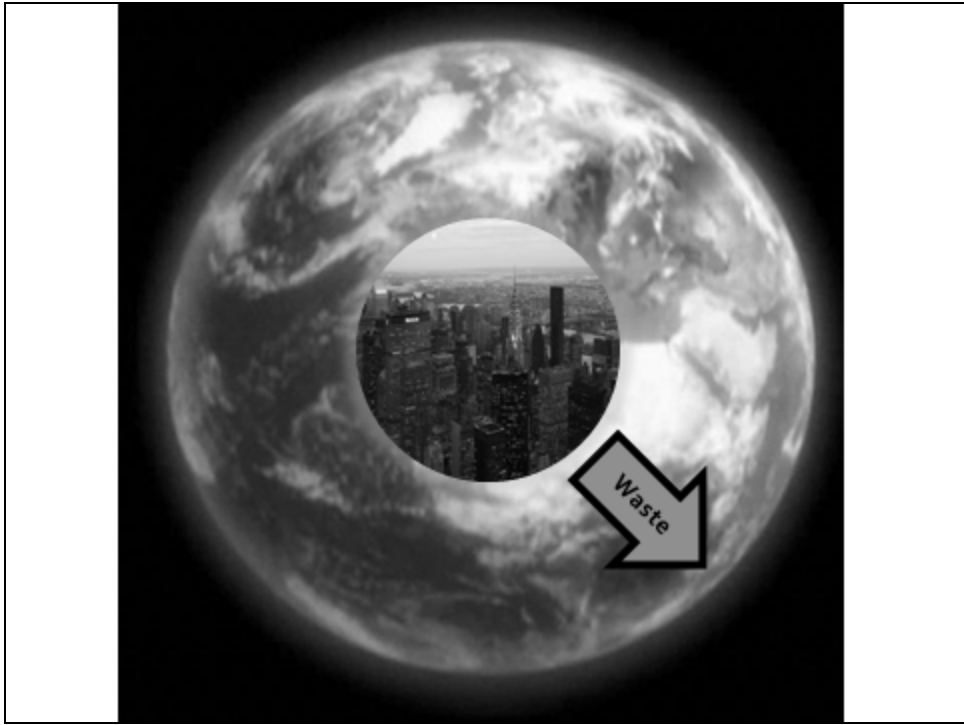
And its not just oil that we are running out of. Many key resources are in decline: biodiversity loss, top soil erosion, phosphate production, fresh water and aquifer depletion, world fish stocks and rain forests to name but a few.

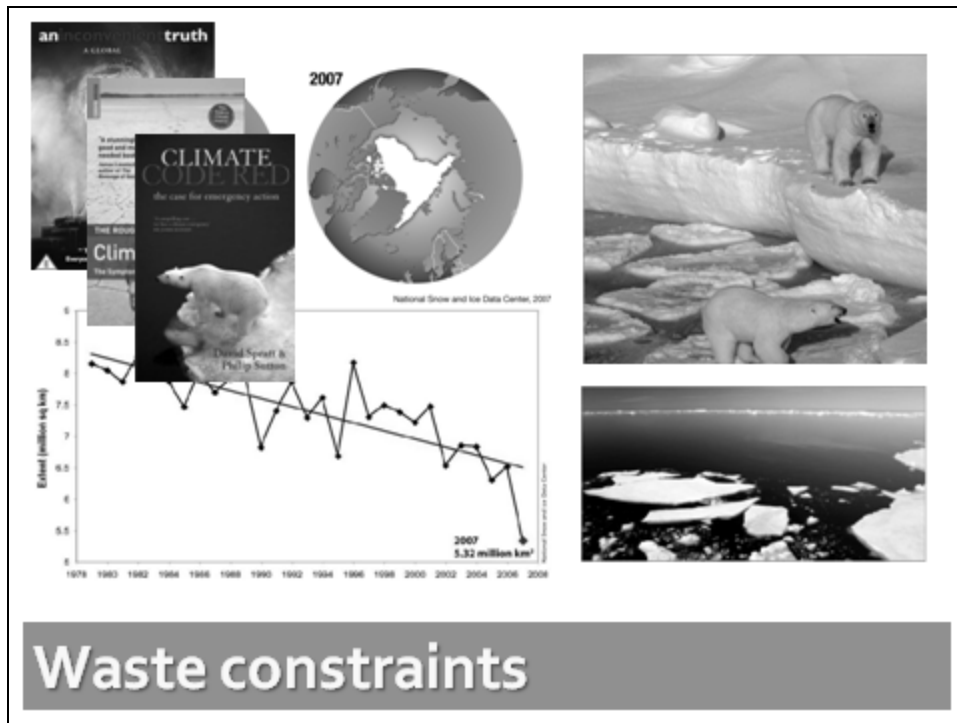
Metals are almost as important to an industrial economy as oil as they are used to make machines and transport electricity.

Many of the world's metals are being consumed at voracious rates as countries such as China and India industrialise.

According to a study in Nature GeoScience, at current rates, many key metals such as Tin, Zinc and Lead will be exhausted by mid-century. Indium, used in second generation Solar PVs will be exhausted in 13 years.

If the rest of the world consumed at even half the rate of the US many of these resources would be exhausted within the next two decades.





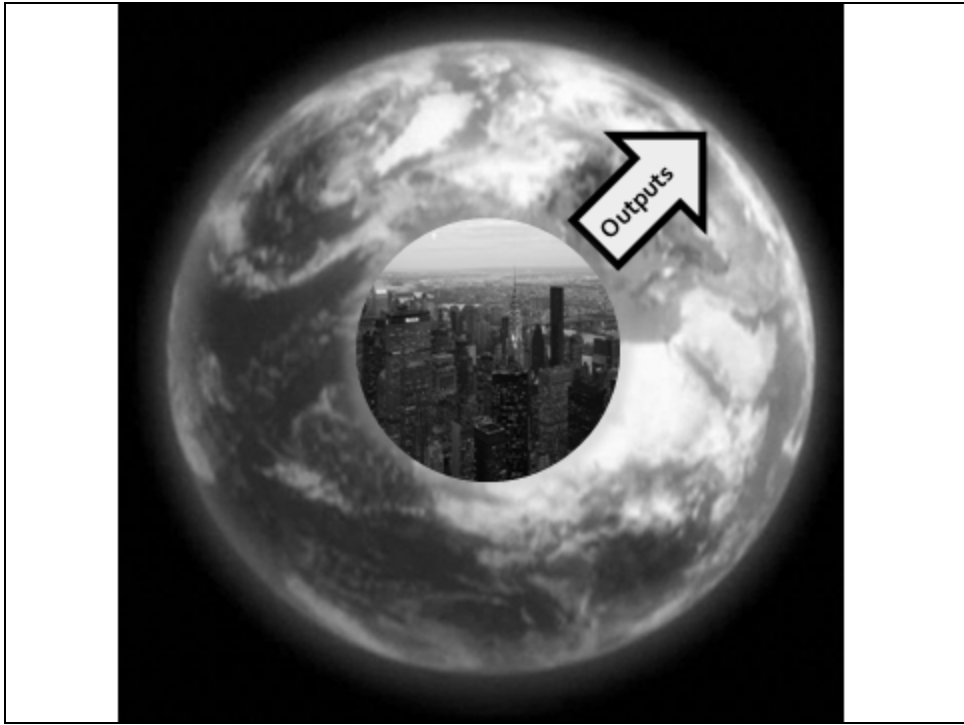
There are many examples of the earth's waste sinks becoming overburdened but none is as serious as our pollution of the atmosphere with CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> – the main greenhouse gases.

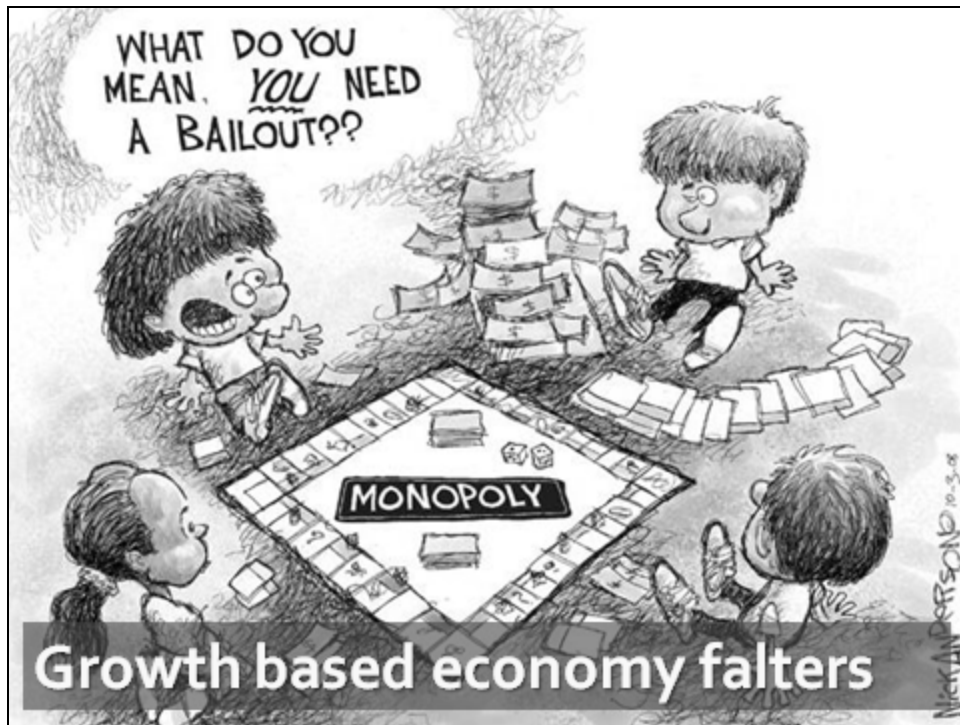
By burning of fossil fuels, land use change and deforestation, CO<sub>2</sub> concentration levels have risen by 35% since preindustrial times.

The Global Average temperature has increased by 0.8 °C but because CO<sub>2</sub> is a long lived gas in the atmosphere (100 years) and because of the enormous thermal inertia of the oceans we are committed to a further 0.8 °C temperature rise even if emissions are stopped today.

Scientists fear going above 2 °C because beyond this threshold positive feedbacks will occur which will cause further unstoppable warming.

The melting of the polar ice cap is a classic tipping point. Normally the ice reflects the incoming sunlight but as the ice melts dark seawater is exposed which absorbs more heat which melts more water and so on. Recent scientific studies suggest that the polar ice cap may be ice free by 2012, much earlier than previously forecast.



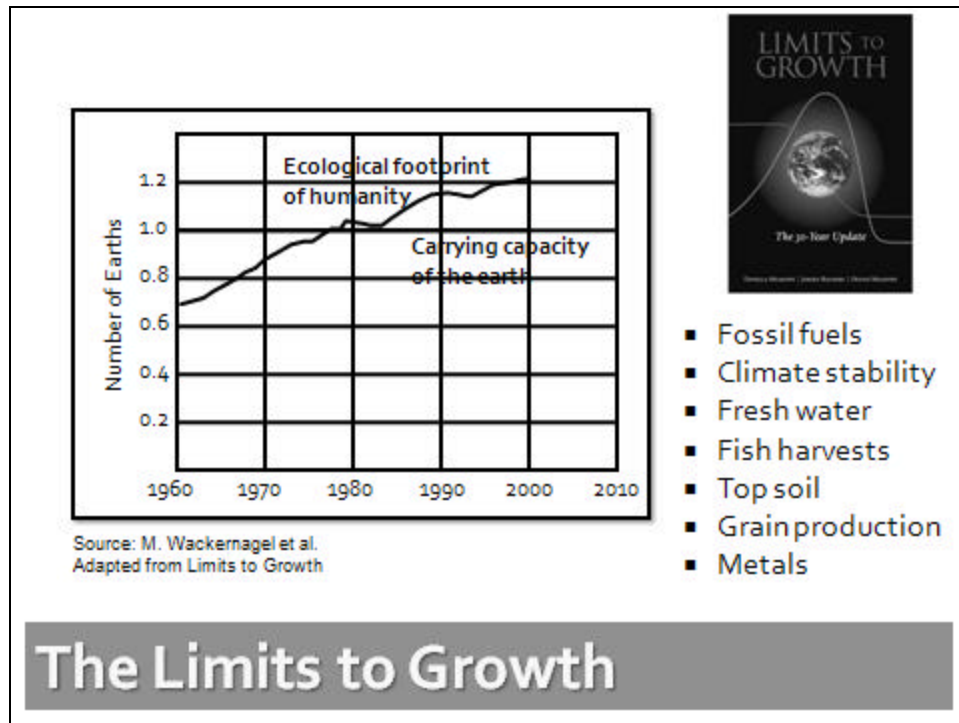


Given these constraints it is hardly a surprise that an economy would sooner or later begin to falter.

Because our monetary system is debt based it has a particular vulnerability to economic constraints. Apart from the 2-3% of actual notes and cash all money is created as interest bearing loans. If no new loans were taken out in subsequent years the money supply would shrink out of existence in a deflationary spiral. In a growing economy new loans are taken out to fund new businesses, purchases new houses etc. Not only that but because the loans are interest bearing each years debt must be greater than the previous. i.e. The economy must grow from year to year or the monetary system will collapse.

The current economic downturn will morph continually into the next. There may be a recovery from the current recession but this is unlikely to last long and will be nipped in the bud by declining energy supplies. As economies cannot maintain growth our claims on the future of economic growth in the form of debt, pension payments and investment returns will become unpayable.

The monetary system will have to be redesigned or replaced to cope with a declining economy.



Since the first oil shocks of the 70's scientists and academics have been warning of the pressures that are being placed on the ecosystem and the finite nature of the earth's resources.

The 1973 Limits to Growth study showed how by the early part of this century the world would be facing serious limits to continued industrial growth and human expansion. Peak oil is an example of a resource limit whilst Climate Change is an example of a pollution limit.

Humanity has been overshooting the biosphere's capacity to sustain our activities. The reason we have the illusion that everything is OK is because we're using up what our children and grandchildren expect to inherit.

Today, it would take at least three Earths to sustain us if everyone had the lifestyle of people in the UK; five if we all lived like Americans. Even for the population of China to reach our patterns of consumption would require a second Earth.

Given the limits to growth we need a fundamental rethink about how we live in the 21st century.



There are two pathways ahead. "Industrial Collapse" or "Controlled descent and thriving communities". What Homer Dixon calls, "The Prosperous way down".

Sustainability in this context is not a lifestyle choice or a political standpoint but a sensible survival strategy for dealing with these converging challenges.

We cannot avoid a potentially very difficult long-term global economic and social transformation. It is a challenge that many other civilisations failed to meet as they ignored the warning signs of a contracting energy and resource base. The question is how to prepare communities for the change and how best to adapt to the transition resolutely, wisely and with foresight.

If properly planned for the future can be better than the present.





Debates on climate change, peak oil and resource depletion have a tendency to get bogged down in absolutist positions of “I’m wright, you’re wrong” that hinders any action being taken. It is more appropriate to manage the risk. So “Just in case nuclear power does’nt solve our energy needs, lets set up a CRESCo”. Very quickly the solutions to the problems we face present themselves as opportunities to create local employment, strenghten communities and build resilience.

Resilience is a term derived from ecology and is a measure of a systems ability to withstand shock from the outside. It can be applied to a community or local economy also. Peak oil acts as a mirror to a community in asking “where has the resilience gone?”, “how can we fend for ourselves in times of diffidulty?”

Unfortunately, over the past 50 years we have exported, dismantled and discredited much of the resilience that our communities depended upon in the past. This infrastructure and local knowledge; food systems, energy and materials will have to be rebuilt as we learn to become more self reliant. Resilience can be measured in various ways:

- % of energy from local renewable sources
- % of food produced locally
- % of businesses locally owned
- average distance travelled to work
- % of building materials locally sourced from sustainable sources



Given the scale of climate change and the transition away from fossil fuels we need buy in from all sectors of society.

Of course we need top down approaches from national and international government such as Strong international climate change protocols, Oil depletion protocol, Tradeable Energy Quotas, Food security programs but these will not be sufficient on their own.

Communities and local government must take the lead and relocalise. Transition initiatives, Energy descent planning, Community supported agriculture, locally owned renewable energy supply companies (ESCOs), Oil vulnerability auditing, Complementary currencies are all examples of bottoms up approaches.

We need to powerdown from our current unsustainable, highly import dependent, energy intensive lifestyle to a safer, leaner, more self-reliant future where the best possible outcome is achieved. To engage the wider community the EDAP should read more like a holiday brochure to the future rather than a dry county development plan.



To face the challenges ahead we must do more than simply change light bulbs and install solar panels. We've got to grow more of our own food, produce our own energy and become more self-reliant. This will necessitate a great 'reskilling'. We will need to learn new and old skills to provide for our needs both as a community and as individuals.

We need to develop localised patterns of living and communities can take the lead. We will not have the energy to maintain the transport dependent, industrial, urban economy we have at the moment. It's an extraordinary challenge but one that is also filled with great opportunity. The technology we need most is the technology of community and involves each and every one of us.



Our culture offers us very few positive or realistic images of the future. Most of the films in our media spell disaster (*The Day After Tomorrow*) or technofantasy (*Star Wars*). A useful tool in *Transition* is to project into the future and imagine a positive future. We need have some idea of where we are going and want to go there before we can start the journey!

"It's 2020 and we are a decade into a huge experiment in which we are trying to convert our country to a sustainable or "steady-state" economy. We have two guiding principles: we don't use natural resources faster than they can be replenished by the planet, and, we don't deposit wastes faster than they can be absorbed. We have escaped the doomed model of economic growth and no one is worse off. It's even possible that we have all become a little bit happier." – *Transition Town thinking*