Peak Oil

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If a path to the better there be, it begins with a full look at the worst

(Thomas Hardy)

Part I: A look at the worst

The scope of the problem

Everywhere we hear and read of the dangers of global warming and the consequences of climate change but there is a threat to our industrial civilisation that is more immediate and potentially as devastating as climate change – a shortage of oil.

The abundance of oil – cheap energy - has allowed the human population to increase far beyond the carrying capacity of the earth. Without cheap oil we will not be able to maintain the food production, inter-continental transport, water cleaning and pumping systems on which we rely. There is plenty of evidence of the alarming results of one species exceeding the carrying capacity of an environment.

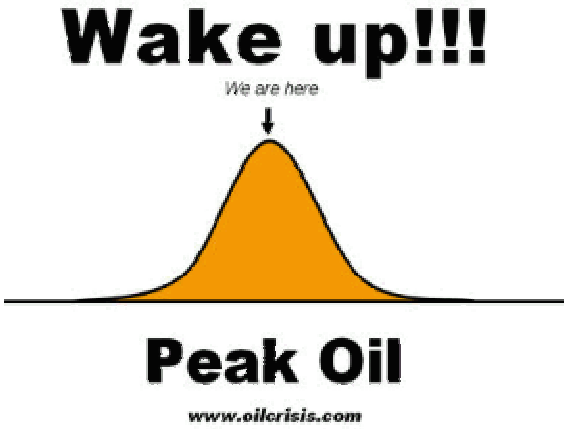
- Humans first arrived on the 64 square miles of Easter Island some thousand years ago. The abundant vegetation and rich soils allowed the population to increase to an estimated 4000. At this point the islanders were using the reserves of vegetation for food and fuel more quickly than they could be replenished by nature. At some stage the last tree was cut down. The population crashed. Captain Cook found some 600 people, eking out a marginal existence there in 1775. One hundred years later only 155 remained.

- In 1944 twenty-nine reindeer were introduced to St Matthews Island; an island rich in lichen, the staple food of reindeer, but without predators such as wolves and human hunters. In 19 years the population swelled to 6,000 and then crashed, in 3 years, to a total of 41 females and one male, all in miserable condition

Oil production is at a peak –now!

Oil companies tend to talk of total reserves rather than maximum levels of production, leading to a false sense of energy supply security. Production from an individual oil well is not linear. The 'wake up' graphic below has time on its horizontal axis and barrels of oil on the vertical axis and demonstrates global oil production. This idea of an inevitable peak in oil production was first mooted by the American Geologist M. King Hubbard, working for Shell, in the 1940s. He

recognised that oil wells reach peak production 30 to 40 years after discovery and thereafter production decreases. In 1956 he predicted a 'peak' of oil production for the US in 1970. In 1970 he was being ridiculed – American oil fields were producing more than ever before. It was several years before everyone realised that he had been right!



Peak oil is the point in time when extraction of oil from the earth reaches its highest point and then begins to decline. We won't be able to say with certainty when we have reached peak oil until after the fact. Many experts say we have already reached the peak. Others say not yet, but within the next few years.

On a global level the discovery of oil reserves were at their greatest in the 1960s. Over 50 oil producing countries, including our North Sea fields, have now passed peak production and are yielding ever decreasing quantities of oil. Worldwide, one barrel of oil is being found for every four that are extracted – known reserves are dwindling rapidly. Prospecting activity is limited as it no longer pays. New refineries and oil tankers are not being constructed as there are not the reserves to justify the required investment.

Current manifestations

In a speech to the International Petroleum Institute in London in late 1999, Dick Cheney, then chairman of the world's largest oil services company, Halliburton, presented the picture of world oil supply and demand to industry insiders. 'By some estimates,' Cheney stated, 'there will be an average of two percent annual growth in global oil demand over the years ahead, along with, conservatively, a three percent natural decline in production from existing reserves.' Cheney ended on an alarming note: 'That means by 2010 we will need in the order of an additional fifty million barrels a day.' This is equivalent to more than six times Saudi Arabia's output today. By 2003, Dick Cheney, as Bush's Vice President, was strongly advocating the invasion of Iraq. It is widely accepted that the war was not about Saddam Hussein's abysmal record on human rights and alleged weapons of mass destruction. The US was prepared to risk souring its relations with the rest of the world and risk the lives of its soldiers in an attempt to secure oil. This war is but the first in a major battle over oil resources. The US is maintaining a crude neo-imperial military presence globally from Kosovo to

Afghanistan, from West Africa to Baghdad. However, five countries, Iraq, Iran, Kuwait, Saudi Arabia and the United Arab Emirates, contain the vast majority of the remaining oil reserves. The current, or imminent, situation of global peak oil production demonstrates just why Washington is willing to risk so much to control Iraq and, through its bases there, the five oil-rich countries. The US is acting from a fundamental strategic weakness, not from absolute strength as is often thought.

Part II A path to the better

1. The example of Cuba

Cuba suffered a dramatic reduction in oil supplies and associated petrochemical derivatives as the Soviet Union, its major trading partner, collapsed in the early 1990s. A decade on from the depths of the crisis, although many problems remain, critical food shortages are essentially over. The Cuban example may hold many of the keys to the survival of civilization in a post oil era.

Up to the peak

By 1989 Cuba had 30 years' experience of a communist regime. Agricultural production was centred on large state-owned farms and cash cropping for export, predominately sugar cane, was the norm. 60% of food for Cuban people was imported as was virtually all oil and oil-derived agrochemical inputs. Access to food was guaranteed by a system of rationing which enabled an average daily consumption of 2908 calories per person (the World Health Organisation recommends a minimum daily allowance of 2400 calories per person). Education under the communist regime was available to all and literacy was at a staggeringly high 96%. 80% of the population lived in urban areas.

After the crash

As the Soviet Union crumbled and the US strengthened its trade embargo Cuba lost:

- 50% of its fuel
- 85% of its trade (export crops of sugar, tobacco and citrus)
- 80% of its agricultural imports (fertiliser, animal feed and pesticides)
- 50% of imported food

In the immediate aftermath there is no doubt that things were pretty tough for Cubans - the average daily energy intake plummeted to 1863 calories per person in 1991. By 1994 the average Cuban's body weight had decreased by 20 lbs. However society did not disintegrate and, a decade later, average calorie consumption was again above the WHO minimum requirements. As Cuba did not conform to the development models of the International Monetary Fund or the World Bank it was barred from grants or loans from these international financial institutions. Nor did Cuba receive food aid from the West. How did the Cubans succeed in feeding themselves?

Transforming the site and scale of production

Sugar mills were closed down and land which had been producing export crops was dedicated to producing food for Cubans. State farms were broken up; farming became a private, family group or small cooperative concern. Food production arrived in the city; vacant land was brought into cultivation and car parks were transformed into neighbourhood gardens. A mass movement reminiscent of our Second World War "Dig for Victory" campaign galvanised some 300,000 of Havana's citizens into turning their patios over to fruit production. Farmers' and urban food markets were established providing trade incentives to

producers. Not all Cubans had pesos to spend at these markets but everyone was entitled to a small, rent-free, parcel of land on which to grow their own food. By 2003 the goal of providing every settlement of over 15 households with its own food production capacity had been met.

Transforming the technology of production.

Chemistry was out and biology was in. Cuba became a gigantic laboratory for farming without petroleum and petroleum derivatives. The island's 220 Crop Protection Centres provide insects and micro-organisms that attack plant pests. Over 15 million tonnes of organic compost was produced and used in 2003. Some 10,000 scientists and 40,000 technicians are now employed in supporting urban agriculture. Animal traction (there are now 2400 teams of oxen in the city of Havana!) has replaced tractors. Vast increases in food production have been achieved without recourse to non-renewable resources. In 2003 petroleum consumption was still only 50%, fertiliser imports only 10%, and synthetic insecticide use only 7% of 1989 levels.

Cuban exports

Cuba may not have regained its export trade in agricultural products but it is an exporter of ideas. Farmers and agricultural technicians from throughout the Americas (excluding the U.S.) and elsewhere visit the island to see sustainable technologies firsthand. Cuban agricultural experts are currently teaching agro-ecological farming methods to Haitian farmers. Ecologists as well as agricultural specialists are finding great promise in the idea that biodiversity is not just a conservation strategy, but also a production strategy.

2. A path for the UK?

Our government is not, apparently, preparing for an oil crisis in the UK. However, we can take steps as individuals and communities to prepare for the inevitable reduction in energy availability. On an individual level this means reducing energy use; switching to low energy light bulbs, insulating our houses and joining a car share scheme are practical steps to take. Buying local, seasonal food and cultivating an allotment also reduces the amount of oil derived calories consumed with food. Going WWOOF-ing, learning about sustainable food production and living lightly may be immensely valuable. On a community level the town of Kinsale in Ireland has set an example and produced an energy descent plan. The process of drawing up the plan involved examining many issues including the potential for local, community food production and alternative public transport arrangements. How about initiating a grassroots group to look at energy descent in your community?

I was introduced to the issues around Peak Oil at a weekend course, ‘Living on the Cusp’, led by Naresh Giangrande at Braziers Park.