

# THE TRANSITION HANDBOOK

From oil dependency to local resilience

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executive summary

## Chapter 1: Peak oil and climate change - The two great oversights of our times

### What is peak oil?: why it is not just the last drop that matters

I . . . had always assumed that oil in our economy worked in the same way as petrol in the tank of a car; that whether the engine was full or almost empty, it would run exactly the same. I thought we would potter along until some day in the distant future someone would put the very last drop of oil in their car and that would be that.

For me, learning about peak oil has been profoundly illuminating in terms of how I see the world and the way it works . . . Climate change – an issue of great severity - is only one half of the story; developing an understanding of peak oil is similarly essential. Together, these two issues have been referred to as the 'Hydrocarbon Twins'. They are so intertwined, that seen in isolation, a large part of the story remains untold.

Without cheap oil, you wouldn't be reading this book now. . . I would not have been able to type it on my laptop, in a warm house, listening to CDs. When you really start thinking about it, it's not just this book that would not be here. Most things around you rely on cheap oil for their manufacture and transportation. Your furniture, entertainment, recreation, food, household appliances, medicines and cosmetics are all dependent on this miraculous material. It is almost impossible to imagine anything else.

It is entirely understandable how we got into this position. Oil is a remarkable substance. It was formed from prehistoric zooplankton and algae that covered the oceans 90-150 million years ago . . . One gallon of oil contains the equivalent of about 98 tons of the original surface- forming, algal matter, distilled over millennia . . . fossil fuels are sometimes referred to as 'ancient sunlight' [because] they are astonishingly energy-dense. . . oil makes us far stronger, faster and more productive than would be possible without it, enabling our society to

do between 70 and 100 times more work . . . We have lived with this potion for 150 years, have got en used to thinking we will always have it, and indeed we have designed our living arrangements in such a way as to be entirely dependent on it.

. . . The amount of energy needed to maintain the average US citizen is the equivalent of 50 people on bicycles pedaling furiously in our back gardens day and night. We have become dependent on these pedalers - what some people refer to as 'energy slaves'. But we are, it should also be acknowledged, extremely fortunate to live at a time in history with access to amounts of energy and a range of materials, products and possibilities that our ancestors couldn't even have imagined.

. . . 'The Petroleum Interval', is the brief interlude of 200 years where we extracted all of this amazing material from the ground and burnt it. . . But can it go on forever? Of course not. . . The key point here is that it is not the point when we use the last drop that matters. The moment that really matters is the peak, when from that point onward there will always be less magic potion year-on-year, and that because of its increasing scarcity, it will become an increasingly expensive commodity.

## **Peak When?**

There is, as you might imagine, a wide range of predictions as to when exactly world oil production might peak, although recently this range has been narrowing. This diversity of opinion largely boils down to the fact that much of the information needed to make a precise prediction is not in the public arena. Around 80% of world oil is controlled by national oil companies, who have no obligation to make their reserves data public.

Germany's Energy Watch Group published a report which reassessed the data and argued very convincingly that world production had, in fact, already peaked in 2006, and "will start to decline at a rate of several percent per year. . . The world is at the beginning of a structural change of its economic system. This change will be triggered by declining fossil fuel supplies and will influence almost all aspects of our daily life. The now beginning transition period probably has its own rules which are valid only during this phase. Things might happen which we never experienced before and which we may never experience again once this transition period has ended. Our way of dealing with energy issues probably will have to change fundamentally."

George Monbiot puts it in stark terms: "Our hopes of a soft landing rest on just two propositions: that the oil producers' figures are correct, and that governments act before they have to. I hope that reassures you."

## **Climate change**

Until a year or so ago, climate change was seen as being such an unappealing subject to really embrace or get intimate with that most people felt happier looking the other way. Since then though, climate change has shifted much more towards the mainstream. . . Even more than with peak oil, I write this section on climate change with great trepidation, as it is such a fast-moving field. . . Climate change is happening faster than most models are able to keep up with, continually confounding expectation . . Climate change is extremely scary. Indeed, if it isn't scary, then you really haven't understood it.

CO2 is such a small part of the overall atmosphere around us that it is measured in parts per million (ppm). . . Pre-industrial levels of carbon were 278ppm, but by 2007 they have reached 385ppm [and have] led to global average temperature rising by 0.8°C. . . While this may not sound like much, just that level of increase has produced alarming changes around the world. These include widespread glacial retreat in the Himalayas, heavier than usual monsoons in India, Nepal and Bangladesh, encroaching drought in Australia, increasing frequency of tropical storms . . .

There is now no argument that the world is warming dangerously, possibly catastrophically, and there is an unprecedented scientific near-consensus that our oil-addicted lifestyles are to blame. We need to be realistic about where we are, and ambitious about what we can do. Climate change is a massive problem, but the worst effects could still be avoided if we are collectively able to engage with the issue.

## **Is there such a thing as a safe limit?**

If we break through the 1°C barrier, as now seems inevitable, we'll see a Mount Kilimanjaro completely bereft of ice, the almost complete collapse of the Great Barrier Reef, and a number of island nations submerged by rising sea levels. A 2°C rise would cause dreadful heatwaves, and increased drought around the world. Breaking through the 3°C barrier would mean that the growing season in Norway would be what it is in southern England today. The 3°C threshold would also bring about the complete collapse of the Amazon ecosystem, and the very real threat of conflict over water supplies around the world.

Beyond that, in a nutshell, runaway climate change is not something you want to experience, or leave as a legacy to your children, yet we appear to be sailing alarmingly close to it. The emerging consensus in recent years has been that the imperative is to keep below 2°C at all costs. . . The reality is that the carbon dioxide already released will continue to push up the temperature for years to come (a phenomenon known as 'thermal inertia') by at least 0.6°C, meaning that we are already committed to a 1.4°C rise whatever we choose to do now. The warming we are experiencing now is the result of greenhouse gases emitted in the 1970s.

. . . While keeping below the 2°C threshold is vital, an increasing number of people are arguing that even 2°C is too little to prevent runaway climate change. David Spratt of Carbon Equity, having evaluated the latest evidence on the scale of the ice melting in the Arctic, writes "Given that we are not yet even at a 1°C rise, yet appear to have unleashed the catastrophic disintegration of the Arctic ice, 2°C is an absurd level to imagine as being 'safe' by any stretch of the imagination." Spratt concludes his study thus: "The simple imperative is for us to very rapidly decarbonize the world economy and to put in place the means to draw down the existing excess CO2 levels. We must choose targets that can actually solve the problem in a timely way."

IPCC researchers concluded that to stay at under a 2°C increase in temperature, humanity has to zero its emissions by 2060. Cuts on this scale won't happen without an extraordinary, unprecedented, global concerted effort. . . Trying to imagine maintaining our current lifestyles but emitting just 10% of the current amount of carbon is extremely difficult - almost unimaginable.

## **The intertwining of peak oil and climate change**

One of the more absurd phenomena to emerge in recent years is that there are climate change activists who dismiss the peak oil argument, and peak oil activists who downplay climate change. It is as if people have discovered terrain which is somehow 'theirs'. . . I will argue in this section that I don't think we can keep them separate, and that doing so does nothing to assist our development of realistic and potentially successful responses. . . Both, of course, are symptoms of a society hopelessly addicted to fossil fuels and the lifestyles they make possible. It is, however, too simplistic to assert that peak oil will mean climate change will be brought under control because we will run out of access to affordable liquid fuels; the situation is much more complex.

Climate change says we should change, whereas peak oil says we will be forced to change. Both categorically state that fossil fuels have no role to play in our future, and the sooner we can stop using them the better. It is key that both climate change and peak oil are given an equal degree of importance in any decision-making processes.

It is also important to point out that unless we plan in advance for peak oil, and adopt measures such as the Oil Depletion Protocol proposed by Colin Campbell and Richard Heinberg, the recession caused by runaway oil prices will blow responses to climate change out of the water. Responding to climate change on an adequate scale requires a lot of money . . . An economic recession - or worse, collapse - will make keeping the lights on our priority, and tackling climate change will slide rapidly down our list of priorities. Facing runaway climate change with a collapsed economy is the scenario we really want to avoid, and we separate these two issues at our peril.

## **Can peak oil engage people more effectively than climate change?**

. . . It has been my experience . . . that peak oil . . . can do more to engage and involve people and communities than climate change. Peak oil educator Richard Heinberg uses the analogy of a car: "At the most superficial level, we could say that climate change is an end-of-tailpipe problem, while peak oil is an into-fuel-tank problem." . . . To mentally explore what their current lifestyles would be like if the inflow of cheap oil were to cease is a powerful way to get people to think about the vulnerability of their oil-dependent state. It can focus the mind more than climate change because it can seem to be more obviously relevant to people's everyday lives.

## **The contradictions of the Hirsch Report**

When the US Department of Energy commissioned Robert Hirsch and his colleagues to write a report looking at mitigation strategies for peak oil, . . . Hirsch himself was unprepared for where the report would take him, and what he would end up writing. "So if depletion is as high as some people think it could be, we're in a very serious, serious problem. The risks to our economies and our civilization are enormous, and people don't want to hear that. This is a really incredibly difficult, and incredibly severe problem."

. . . Clearly not a man to mince his words. The Hirsch Report was dynamite, and is seen as

the first 'official' document to really take peak oil seriously. However, it is also worthy of deeper inspection, as it . . . also offers an illuminating and terrifying insight into the responses to the challenge of peak oil. . . The nub of the report's problems can be summarized in the term "viable mitigation options". The report's definition of what these options might be are profoundly at odds with what this book will propose. For Hirsch, viable mitigation options are sought from the basic premise that the show must go on in its current form, that business as usual must be preserved at all costs.

. . . Richard Heinberg [explained] . . . "if it were feasible on any large scale, this would produce a climate catastrophe, but there's no evidence of concern for climate change issues whatsoever in the report. The goal of the authors is to suggest how we could keep the engines of modernity running as long as possible."

. . . the 2005 report set out a 'crash program' to keep all the cars in the US on the road. His plan would cost \$1 trillion a year, and would involve a massive expansion of coal-to-liquids, extraction from tar sands, gas-to-liquids and so on . . . Hirsch laid out a clear and perfectly reasoned argument why we cannot possibly keep all our cars going and why we need to break our addiction to the car. He just hadn't realized that that was what he was doing.

If your starting assumption is that the show must go on at all costs, you will scramble around for whatever strategies and technologies might, in theory, allow you to do so. . . Alternatively, when peak oil and climate change are seen as inseparable, we need to completely rethink our 'viable mitigation options', as well as acknowledge that business-as-usual is untenable.

. . . [If we had] \$1 trillion a year budget to initiate and drive a program of global powerdown, think what could be achieved! Lester Brown writes: "The automobile industry went from producing nearly 4 million cars in 1941 to producing 24,000 tanks and 17,000 armored cars in 1942 - but only 223,000 cars . . . By the end of the war, more than 5,000 ships were added to the 1,000 that made up the American Merchant Fleet in 1939." When society decides to put its weight behind change, things can move very fast. While some of this needs to be driven at a national government level, much of the momentum and pressure can come from the local level. People need to hunger for these changes, and to see them as more desirable than the the way things are.

The lesson from the Hirsch Report, then, is . . . be sure that we are asking the right questions. The question is not "How can we keep everything going as it is?" We should instead ask how we can ensure well-being for all within realistic energy constraints. The Hirsch Report fails to ask the right questions. When devising solutions, we must address the fundamental reality of human beings, climate change, and peak oil from the outset. The 'viable mitigation options' we come up with will depend entirely on the nature of the questions we ask.