

THE “TRIPLE CRISIS”¹

The solutions outlined in this book address serious global problems in three interconnected areas: the economy, our energy supplies and the environment.

Our financial problems are associated with losses leading to capital shortages in the banks, and over-indebtedness in the rest of the economy. Even if our immediate financial problems are resolved, the UK and similar countries will still have unsustainable budget and trade deficits.

These problems will be made worse if, as the economy recovers, oil prices rise rapidly again. As fossil fuels become depleted, and if political instability continues, energy insecurity will rise, unless prompt action is taken.

Human emissions of Carbon Dioxide and other greenhouse gases are unsustainable and will become even more so, if the world turns to coal and unconventional oil for energy as the oil price rises. This leads to

Other serious issues that need to be born in mind include the threat of diseases emerging as a consequence of climate change and the threat of proliferation of biological and nuclear weapons.

The particular focus of this book is the problem of climate change and strategies to reduce global greenhouse gas emissions. Such strategies at times can also address economic and energy security concerns.

The Economic Crisis

Since mid-2007, there has been a systemic financial crisis affecting modern capitalist economies. The 'credit crunch' is a collapse in confidence between banks, as evidenced by the rate at which banks are willing to lend to one another². The problems, now apparent, include:

- a) Large losses in some banks leading to an under-capitalized banking system.
- b) High levels of indebtedness; possibly not enough cash in circulation in the non-financial sector relative to the amount of debt.
- c) Massive government fiscal deficits causing a financial obligation on future generations; insufficient saving for future pensions obligations.
- d) Persistent current account deficits in some countries such as the US and UK.

We are in the midst of a widespread recession. Solutions to climate change, which must include large-scale investment in low carbon energy (IEA 2008a), may help us out of these problems. Later in the book, I will argue that we could make longer term changes to our tax systems to encourage a more efficient, equitable and sustainable economy³.

The Energy Crisis

Energy demand is rising rapidly. There has recently been a crisis in the food (The Economist 2007) and energy (The Economist 2008) sectors, with volatile prices and political instability in suppliers of energy. Oil reserves are clearly finite, but significant debate exists as to the imminence and importance of the concept of 'peak oil' (Simmons 2005), (IEA 2008b), (BP 2008). If, as seems likely, easy oil is unable to fill demand, the price of energy will rise. This *rise in prices* will induce a large transfer in rental payments from the energy consuming nations to the energy exporting nations. This is damaging to the interests of the oil importing countries such as the West, India and China. A rise in the price of oil will also encourage much more damaging forms of oil to be developed.

The Environmental Crisis

Every year we release into the atmosphere over 30 billion tonnes of Carbon Dioxide plus large quantities of other greenhouse gases (GHGs) such as methane, by burning fossil fuels (coal, oil, and natural gas). Our overall emissions are already 5-7 times above the rate at which CO₂ is sequestered by the oceans, and are still increasing. The elevated concentrations of CO₂ and other GHGs have two serious effects.

- a) Much of the Carbon Dioxide released into the atmosphere dissolves into the upper part of the oceans. This reduces the pH of the ocean, an effect known as 'ocean acidification'. This reduced pH is likely to lead to the dissolution of the exoskeleton of micro-organisms, with further knock-on effects on ecology and the global food chain.
- b) It is well known (Arrhenius 1896), (IPCC 2007a) that higher concentrations of carbon dioxide (CO₂) will cause an overall warming of the Earth in the 'enhanced greenhouse effect'. Scientists estimate that an increase in global temperature of 2°C above pre-industrial levels ('dangerous climate change' (Schnellhuber & Cramer 2006)) would cause widespread serious effects such as the melting of land ice, desertification, and the collapse of major ecosystems (IPCC 2007b). In addition, the heating-induced degradation of carbon stores such as the Amazon rainforest⁴ and Siberian permafrost⁵ has the potential to release

2 The spread between the rate paid for interbank lending (with credit risk) and that paid for fixed-for-floating swaps (without serious credit risk) provides a useful diagnostic of inter-bank trust. For the US experience see: <http://tinyurl.com/79v4tg> (p1) and for the UK <http://tinyurl.com/9b986l> (p13). Note the sharp spike in October 2008 after the bankruptcy of US investment bank Lehman Brothers.

3 See chapter 3 of this book

4 Adding as much as 100ppm CO₂ (Cox et al. 2004), (Cox et al. 2000)

5 (Anisimov 2007) estimates this effect as a modest 100 Mt, or 40 ppb of Methane, leading to an additional temperature rise of 0.012 °C. By contrast, Walter et al. (Walter et al. 2006) notes, with concern, the age (40,000

further large quantities of stored carbon (in the form of CO₂ or Methane) into the atmosphere. In the absence of changes to our present course, within one or two decades we would probably be committed to such a temperature rise (den Elzen & Meinshausen 2005), (Anderson & Bows 2008).

Other Issues

The threats and challenges outlined above are serious risks facing humanity. Rees (2003) outlines a catalogue of threats and risks facing humanity over the next hundred years, which might cause the collapse of human civilization. In addition to climate change, energy insecurity and economic instability, two others stand out: disease & biological agents and nuclear weapons.

Diseases and biological agents pose an extremely great threat for two reasons: First, human beings are disturbing natural habitats more and more around the world; furthermore climate change threatens to disturb ecosystems further. Such changes can lead to the emergence of new diseases. Second, scientific advances promise to understand more about the very fundamentals of life. Such discoveries risk providing the knowledge needed to create extremely harmful biological agents. Third, people travel more often and more rapidly than in the past. An interconnected world spreads diseases more rapidly. There are serious implications both good and bad to the increase in human connectivity. In the past, humanity has lived in small communities. Now we are living in a single 'small-world' ⁶. In the past there may have existed diseases that were both virulent and fatal but which destroyed only their host community, and therefore died out. The danger of the present situation is that, with the spread of modern communications the 'host community' is now the entire world and the evolutionary barrier to extremely virulent and fatal diseases causing widespread harm is reduced.

The threat from nuclear weapons is, in my estimation, less serious than that of diseases, but is still extremely serious. A few kilograms of weapons-grade nuclear material can cause a nuclear blast. The technologies and materials and the know-how for developing nuclear weapons must be controlled, so that the world moves towards eliminating nuclear weapons.⁷

years) of the recently released methane and the overall size of the sink “500 GtC” (similar in magnitude to atmospheric carbon) (Zimov et al. 2006).

⁶ A discussion of the implications of this for the planet can be found in Watts (2004)

⁷ See <http://www.globalzero.org/> for a recent initiative.

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