

Avoiding Catastrophe: An Acute Danger From Changing Climate

By Paul Tempest*

The most pressing message from Lord Oxburgh in the previous article is its warning about the likely severe impact of climate change within the next 35 to 50 years. The accumulation of greenhouse gas in the earth's atmosphere can be attributed largely and with a high degree of certainty to industrialisation in the nineteenth century mainly to the use of coal in Europe and North America and to an acceleration of much wider pollution of the atmosphere during the twentieth century. There has been no sign of abatement so far in the twenty-first century. Indeed, by 2035, global emissions of carbon dioxide are expected to be almost double the level in 1990. We are no longer discussing a hypothetical outcome in a distant future. The build-up of scientific evidence has already reached a tipping point, a very serious matter that should be of immediate concern world-wide.

For the great majority of children on this planet today, the risk may be all too apparent. Within their lifetime, they will most probably witness major economic disruption caused by climate change. Unless a strong curb on greenhouse gases can be devised and achieved, these, our children and grandchildren, are likely to witness a progressive sequence of events including the breaking down of the Gulf Stream, the melting of the ice-caps and the disruption of monsoons, each having chaotic impacts on global agriculture, accessibility to clean drinking water and curtailment of food supply. Along that track, rising sea-levels pose very serious problems for the energy industries with considerable damage to specialised ports, power stations, particularly nuclear power plants and liquefied natural gas plants sited close to the shoreline, and to exploration and development activity. As a consequence, damaging disruptions to international trade and investment will threaten to slow down the momentum of global economic growth and the relief of poverty and distress.

Fossil Fuels are Necessary To Maintain Growth Momentum

As Lord Oxburgh argues with compelling scientific evidence and relentless logic, we cannot afford to shut off the use of fossil fuels without any credible replacement in sight. Indeed, with continued population growth and enhanced expectations of a steady rise in global per capita income, the demand for coal, gas and oil can be expected to continue to rise roughly in line with population and economic growth. Wind, solar and hydro will continue to grow but will find it very difficult to enhance their small current share of the energy mix, less than 15% at present, out of which hydro accounts for half. Nuclear development (4% of the mix) has been slowed markedly by the decisions of Japan and Germany to run down their nuclear capacity and by the widely held fears that rogue terrorists and irresponsible states will seek and may achieve a proliferation of nuclear capacity as a first step on the road to acquiring a nuclear weapon manufacturing capacity of their own. So globally, we have to accelerate much more strongly fundamental research and the rapid implementation of new non-pollutant and less dangerous energy technologies. Meanwhile, it is essential that we invest adequately and evenly to ensure an increased supply of fossil fuels to tide us over.

Investment in Carbon Capture and Storage

So our first priority is to ensure that carbon capture and storage (CCS) is implemented worldwide as fast as possible to the point where we can substantially reduce its impact on the atmosphere. This is not an impossible task, but it is one that requires a global consensus on the necessity for this change and a much wider understanding of the dangers that we will otherwise face. The problem at present is essentially one of attracting adequate investment in these new technologies. What is seen at present as a dubious prospect of costly and incomplete waste-management has somehow to be transformed into a positive commercial venture with long-term prospects of generating substantial profit. At the same time governments have to be fully convinced of the urgency of these issues and the need to move to much more effective international co-operation and implementation.

Adverse Impacts of a Falling Oil Price

The abrupt fall in the oil price in late-2014 has diminished both the flow of surplus funds from the fossil-exporters and the appetite of the energy investors seeking a fast, secure stream of profit. Consumer governments worldwide have also become increasingly nervous about their own budget shortfalls and about preserving secure access to imported energy. So, many are focussing on the

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short-term to the neglect of the long-term fundamentals. Investment so far in carbon capture and storage has been very slow indeed with only one plant (in Canada) operating at present and that single plant is dependent on very heavy state subsidy. The high cost of subsidy and consequent low expectations of an acceptable rate of return for the commercial and industrial investor and high risk in mostly brand-new, unproven technology is a strong deterrent for the private sector. Some radical new thinking and a burst of industrial innovation is needed to dispel this gloom.

Reinvigorating the International Infrastructure

In our view, much of the international infrastructure today is outdated, inefficient and no longer fit for purpose. New institutions, such as a brand-new international energy bank, a new co-ordination agency for stimulating advances towards more efficient energy use and carbon capture and new financing packages will need the backing of a re-focussed United Nations protocol on carbon capture.

Now for the Good News – Ample Fossil Resources

As indicated in my earlier article, oil and natural gas reserves, swollen by new discoveries of shales and deep-water oil and gas, offer some confidence that supply can meet demand until the bridge to new technology can be safely crossed.

How Do We Achieve these Carbon Capture Objectives?

As a starting point, I offer this matrix:

- Long-term Objective – We must ensure that the global population and economy is not put at risk by the failure to implement permanent effective climate change remedies in good time
- Short-term Objective – The acceleration of new technology and stimuli for the necessary financing has to be seen widely to be on the right track as soon as possible.
- Resources – ample fossil fuel resources can help to bridge the gap.
- Intelligence – co-ordination of ever-advancing telecommunications should assist in market transparency and speed of implementation.
- Obstacles – the greatest obstacles are essentially political – power-block rivalries, regional infighting for access to resources, local squabbles over investment failures.
- Surprise – we somehow have to develop a new means of conveying optimism and confidence in the global long-term future.
- Superior Technology and Skills – New centres of technical excellence and skills training will need access to both public and private financing and incentives to attract the best recruits..
- Identifying Weakness – High-lighting weakness is as good a route as any to enhance efficiency. A new generation of energy automation and enhanced co-ordination will be needed to displace the obsolete and atrophied systems still to be found worldwide.
- Communication co-ordination – will be needed to achieve the best results.
- Simple orders – the use of a simple, standard world language understood by all is a pre-requisite. For the time being, this will be English. Within 50-100 years, it may well be Chinese.
- Concentration of Fire – New global, regional and national centres will be needed to mobilise the right resources whenever major obstacles are encountered.
- Reinforcement Options – To what extent can additional resources be called up through the international agencies responsible for such responses?
- Securing the ground – What incentives can be devised to curb new pollution?
- Follow-up – Enhanced sensitivity for consequences hitherto unseen.
- Contingency Planning – A series of sessions at the 3-day WEG International Consultations in Windsor Castle in March 2015 will address these issues.

Atmosphere, Oceans and Space – the New Science

Among the advanced scientific community, the penny has again already dropped. A rational scientific consensus was already being expressed 20 years ago, resulting in the Kyoto Conference of 1997 and consequent Kyoto Protocol endorsed by the United Nations but deeply flawed by the division of governmental opinion, the determination of industry and commerce led by the heavy weight of the energy industries to sweep the proposed targets and strategies under the carpet and a confused, largely indifferent response from public opinion. Within the last five years, a new tipping-point has been reached as the leading scientists have realised the gravity of the threat to the earth's atmosphere. The pace of research swollen by access to the necessary funds has provided re-evaluations of the usefulness of ocean, space, chemical and medical research. It is here where we may well find the solutions to some of our current concerns about an abundant long-term global energy supply.