# Editorial

## "And May was come, the month of gladness"*

*Alan Wells*

## Climate change can be halted

At the beginning of May the UN concluded that climate change can be halted. The verdict of the economists of the UN's Intergovernmental Panel on Climate Change (IPCC), issued in Bangkok, Thailand, on 4 May came in the final part of the IPCC's Fourth Assessment Report, or AR4. The first two parts, issued in February and April, dealt with the science of climate change and its impact. Both painted dire pictures of what is likely to happen if emissions of $CO_2$ and other greenhouse gases continue unabated – world temperatures soaring by up to 6°C over the coming century, with potentially catastrophic effects for mankind. These forecasts have contributed to a growing feeling of pessimism among senior scientists and politicians involved with climate change.

The continuing refusal of the US Bush administration to get to grips with the issue (of which more below); the realisation that the developing countries will produce emissions at gigantic levels; and the recognition that climate change is proceeding faster than expected, are leading some observers to take a dark view of the future.

Yet, by contrast, the third part of the IPCC's 2007 assessment, which deals with controlling climate change and emissions ("mitigation") is more positive. The greenhouse gases, such as carbon dioxide, whose emissions growth is causing the atmosphere to warm, can be brought under control, it says – but only if governments act decisively. Existing and emergent technologies, ranging from renewable energy and nuclear power to carbon capture and storage, will be adequate to make the reductions in emissions essential if the world is to avoid catastrophic rises in global temperature This can be done at comparatively low cost – provided the right incentives are put in place.

**The reports recommendations**

*Lifestyle*
The report acknowledges that changes in lifestyle "can contribute to climate change mitigation across all sectors".

*Energy supply*

- Renewable energy: "Can have a 30-35 per cent share of the total electricity supply in 2030 at carbon prices of up to £50 per tonne."
- Nuclear power: "Can have an 18 per cent share of the total electricity supply in 2030 at carbon prices of up to £50 per tonne – but safety, weapons proliferation and waste remain as constraints."
- Carbon capture and storage: "CCS in underground geological formations has the potential to make an important contribution to mitigation by 2030."

*Road transport*
Biofuels are projected to grow to three per cent of total transport energy demand in 2030. "This could increase to about 5-10 per cent depending on future oil and carbon prices, improvements in vehicle efficiency and the success of technologies to utilise cellulose biomass."

*Aviation*
"Medium-term mitigation potential for $CO_2$ emissions can come from improved fuel efficiency. However, such improvements are expected to only partially offset the growth of emissions."

*Energy efficiency*
"Energy efficiency options for new and existing buildings could reduce $CO_2$ emissions".

*Industry*
There are too many plants with high emissions. "Full use of available mitigation options is not being made."

*Farming and forestry*
Careful farming can help maintain the carbon stored in the soil, and also keep down emissions of other greenhouse gases.

*High-tech fixes*
"Geo-engineering options, such as ocean fertilisation to remove $CO_2$ from the atmosphere, or blocking sunlight by bringing material into the upper atmosphere, remain unproven".

*Long-term mitigation*
Stablisation of greenhouse gas concentrations at a range of levels can be achieved and this can be done "by deployment of ... technologies that are currently available and those that are expected ... This assumes that appropriate and effective incentives are in place."

The key incentive is a mechanism no one had heard of 20 years ago – the price of carbon, as determined by markets such as that of the European Union's Emissions Trading Scheme. If it is high enough, moving to a low-carbon economy will be a cost-effective measure around the world, and thus likely to happen much faster.

* John Lydgate, *Troy Book*, Bk i, 1.1293.

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The report focuses on the feasibility of making the enormous cuts in emissions necessary to stabilise greenhouse gas concentrations in the atmosphere at a level where the temperature rise would be halted, and says, it can be done. Individually, each measure – such as renewable energy or improvements in efficiency – is not enough on its own to lower carbon emissions to the point where the climate can be stabilised. Collectively, though, these policies operate like "climate stabilisation wedges" that successively ratchet down future emissions, lowering them sufficiently that global warming can be controlled. At present the level of carbon dioxide in the atmosphere is about 382 parts per million – one third higher than before the Industrial Revolution. The IPCC report suggests that it would be possible to stabilise atmospheric carbon dioxide at between 535 and 590 ppm, and this might be enough to avert catastrophic climate change – if these carbon-curbing measures are enacted.

It claims renewable energy, which provides 18 per cent of the world's electricity, could provide 35 per cent by 2030, and nuclear power, on a 16 per cent share, could provide 18 per cent by the same date. However, it notes of nuclear: "Safety, weapons proliferation and waste remain as constraints".

It proposes that biofuels could play a significant part in reducing transport emissions, and the biggest gains might come from energy efficiency. Exotic fixes, such as putting objects in space to shield us from sunlight, are dismissed as "speculative".

On the fashionable idea of carbon offsetting – paying a firm to plant trees to compensate for the $CO_2$ emitted on plane journies – the report is silent. What it does insist on is the necessity of having a high price for carbon, to make the introduction of low-carbon alternatives for energy generation and transport cost effective around the world.

The price is, in effect, the cost, in a market such as that formed by the EU Emissions Trading Scheme, of a "carbon credit", a notional tonne of carbon that companies will need to buy when they want to emit more $CO_2$ than their government will allow. The more governments squeeze companies' $CO_2$ allowances, the higher the price is likely to go, so in effect the price level is in the hands of governments. When the second period of the EU trading scheme begins in 2008, it is thought that carbon will trade at about $25 a tonne.

The core of the report is the calculation of how much $CO_2$ can be cost-effectively reduced at a given level for the price. It says that if the price were at $20 a tonne by 2030 emissions could be cost-effectively cut back by up to 17 billion tonnes of greenhouse gases per year. If it were to rise to nearly $100 a tonne by the same date, the cut could be as much as 31 billion tonnes, which would be the 50 per cent reduction the world needs to avoid disaster. The price of doing all this varies with the rate of the world's economic growth, but it reckons it could be done for less than one per cent of global GDP, a figure similar to that given by the British economist Sir Nicholas Stern in his report last year.

## A pragmatic USA?

On 18 May Harlan Watson, President Bush's chief climate negotiator, rejected any caps on US emissions or participation in carbon trading. Despite a broad consensus that markets – in the form of a globally regulated trade in carbon – are the way to achieve the reductions in emissions, the US delegation at a United Nations meeting in Bonn insisted that further technical work was needed before talks could begin on a son-of-Kyoto agreement, a move that could delay any progress for a further year. Such a delay could be disastrous for efforts to halt deforestation, one of the main causes of global warming. The world's forests, which are being destroyed to feed our markets with cheap timber, palm oil, soya and beef, contain twice as much $CO_2$ as that already in the atmosphere but were not included in the Kyoto agreement.

Then, at the end of May the world briefly wondered whether the US administration was changing direction on its stance on climate change. US President George W. Bush sought to take some of the heat out of the international condemnation he would face on global warming at the Group of Eight (G8) summit, when the US was expected to block proposals for binding cuts in greenhouse gas emissions by tabling his own plan for tackling climate change under which the US would convene meetings over the next year among the world's 15 greatest polluters. These would set their own, looser goals for reducing emissions but allow individual nations to develop different strategies for meeting them.

"The United States takes this issue seriously," said Mr Bush. "The new initiative I'm outlining [...] will contribute to the important dialogue that will take place in Germany [...]." He promised that America would work with other countries "to establish a new framework for greenhouse gas emissions for when the Kyoto Protocol expires in 2012".

The President's language was a marked contrast to that of earlier in his administration when he questioned whether climate change was a man-made problem and refused to ratify the 1997 Kyoto Protocol, not least because it exempted China and India who were emerging as competitors from the first round of emissions cuts.

Mr Bush was not, however, willing to accept EU proposals for a global carbon-trading programme under which companies would buy and sell pollution permits since his administration doubted the effectiveness of measures that "would restrict economic growth and investment for new research".

The US argued that its own progress in cutting carbon dioxide emissions in 2005 showed that a less rigid policy of promoting new technology can also

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achieve results. Mr Bush said that all countries, including "rapidly growing economies like India and China" needed to "establish midterm management targets and programmes that reflect their own mix of energy sources and future energy needs".

His proposals did little to impress environmental groups and there was a muted reaction from European leaders such as British Prime Minister Tony Blair and German Chancellor Angela Merkel, who have led international pressure for more action on climate change.

In fairness it could be said that the US had opted for pragmatism: accepting that global warming is a reality caused in significant part by human activity and much of that is the result of the production of greenhouse gases, including carbon dioxide but refusing to sign up to targets that are either unattainable or meaningless, or worse, if taken seriously would prove economically self-immolating.

Moreover, early estimates for the US in 2006 showed that emissions actually fell last year for the first time since 1991, and for the first time ever in a year when the US did not experience a recession. That suggests that American companies and consumers are already finding ways to trim their carbon footprint and to lower the carbon concentration of their economic activity. This progress would certainly be further assisted by good public policy, such as a carbon tax, a proposal many of the current crop of presidential candidates on both sides of the political divide, now favour.

## G8 leaders agree "substantial" greenhouse gas cuts

When G8 leaders met in the Baltic coastal resort of Heiligendamm, Germany it was announced on 7 June 2007 that they had reached a landmark deal on climate change, agreeing to cut greenhouse gas emissions in half by 2050. Details on the agreement were not readily available, but the German Chancellor said it will pave the way for United Nations-led efforts starting in December in Bali to find a successor deal to the Kyoto Treaty, which expires in 2012.

The eight powers failed to overcome US resistance to committing to specific numerical targets to curb global warming but did refer to the goal of some countries of cutting emissions by 50 per cent by 2050. Washington had resisted attempts by Dr Merkel to set a firm goal for cuts needed to combat a warming of the earth's surface that scientists say risks swelling sea levels and causing more droughts and floods, but she secured a partial victory by securing an inclusion of the target in the text. The European Union believes 50 per cent cuts are needed to ensure that global temperatures do not rise more than 2° C (3.6° F) above pre-industrial levels, a threshold it says will trigger "dangerous" changes in the climate system. As member states wrangled over the final text, US President George W. Bush took a conciliatory stance, saying the US was ready to take the leading role in a global bid to fight climate change, but that China and India must join in. The summit text confirmed that the world's leading industrialised nations would act to stem the rise in global warming gases, followed by "substantial" reductions, the most serious commitment to action on the issue by the US, the world's largest global warmer.

The German Chancellor said she was "very, very satisfied" with the agreement, but acknowledged that the accord was a compromise that fell short of her hopes for a binding deal. Environmentalists condemned the G8's failure to agree on specific, binding goals.

## Conclusions

Central to successful implementation of the IPPC's AR4 will be setting the price for a ton of carbon at the appropriate level – the market mechanism that makes it expensive to emit carbon and economical to save it. Effectively, this means putting a real price on the environmental cost of polluting the atmosphere with extra carbon dioxide. The cost is one that we can no longer afford to ignore.

The G8 leaders must agree on a numerical target as a significant first step, and not taking that first step is going to condemn us to the impacts of climate change, which are already being keenly felt in southern and eastern Australia, where climate change has already triggered a farming revolution in a now arid grain belt.