

Climate Change: Answering the Sceptics

The latest scientific findings have again reinforced the case for urgent action to halt global warming. The political establishment responds with more hot air. The very limited Kyoto protocol on greenhouse gas emissions has been ratified – but without the US. Meanwhile, Tony Blair backs British big business demands. PETE DICKENSON reports.

GLOBAL WARMING SCEPTICS have often claimed that fluctuations of the earth's temperature, such as those being seen now, are natural and have been occurring throughout history. At the recent meeting of the American Association for the Advancement of Science in Washington, however, strong evidence was presented which, although still to be published in the scientific press, indicates that global warming is due to human activity. The new findings come from studies of variations in ocean temperatures that used seven million readings stretching over 40 years. It is important to analyse these ocean temperature changes because 90% of heat from the planetary warming of the past 40 years has gone directly into the oceans, the conference heard.

Scientists from the Scripps Institute of Oceanography in San Diego argued at the meeting that each of the oceans warms differently at different depths and therefore provides a fingerprint to look for that can help identify the causes of global warming. For instance, particular patterns of temperature variation with depth and position are associated with particular causes, such as natural variation, solar changes or volcanic effects. The model that most closely matched the fingerprint, however, was that for global warming. What struck the researchers was the remarkably close statistical fit of the data with the global warming model, leading them to dismiss any other reason for the observed water temperature rise.

The actual sea temperature rise over the last 40 years does not seem dramatic, ranging from 0.5-1 degree Centigrade, but what is significant is the vast quantity of extra heat stored in the oceans as a result of this. The effect of this amount of heat being released could alter important warm-water currents like the gulf-stream, as melting glaciers empty into the North Atlantic. This could radically alter the climate of North-Western Europe, potentially causing big drops in temperature in winter.

Bush and the lobby of US oil multinationals that he represents consistently attack the science on which predictions are made of possible future environmental disaster linked to global warming. The Telegraph, a leading British conservative paper, has called climate change theory a 'left-wing, anti-American, anti-West ideology'. It would be

wrong, however, to form an opinion on this scientific controversy based on who is in the camp of the global warming sceptics. It is clear that the US oil lobby has a vested interest in 'denying' the theory of human induced global warming, since burning oil products is one of the major causes. Nevertheless, the arguments must be considered on their own merits. To do otherwise would be to bend to the current post-modernist scepticism about the validity and worth of scientific investigation, a scepticism that attributes undue weight to the subjective motives of the actors involved. In a covert manner Bush and the global warming sceptics play on the disenchanted public mood with regard to science.

Karl Marx described science as the handmaid of capitalism, and in this role it has been shaped – and ultimately distorted and corrupted to an extent – in its quest to interpret and understand our material existence, particularly in the epoch of capitalism's imperialist decline. This explains why there is growing distrust in society of science and all its works. A notorious example of this was the role of the scientific establishment in covering up the BSE scandal, which led to an undermining of public confidence in the value of science. Despite understandable doubt about its progressive and benign role, however, scientific investigation remains rooted, in the final analysis, in a materialist approach to achieving understanding and as such retains its validity.

The sceptics' arguments

THE GLOBAL WARMING sceptics have taken three basic positions: first denying that warming is happening at all; then saying that it is a natural phenomenon, not human induced; and finally down-playing the seriousness of its effects. As the evidence has mounted supporting the idea that the threat is real and due to human intervention, they have retreated from one position to another. There are, however, those who still deny that the earth's temperature is rising, like Fred Singer, founder of the think-tank Science and Environmental Policy Project. Since 1979, he says, the global climate has if anything cooled.

The debate about whether it is the greenhouse effect or natural fluctuations that are causing global warming also continues. A correspondent from Edinburgh University in a recent issue of New Scientist magazine claims that the evidence is contradictory about when global warming began. He cited a recent paper in the leading science journal Nature that studied temperature changes over the past millennium which indicated that global warming began in 1600. This would mean, of course, that the rise in surface temperatures was not due to the greenhouse effect, since carbon dioxide levels did not begin to increase significantly until the industrial revolution 150 years later. Also, the same writer claims that the Nature paper supports the view that the 20th century was no warmer than the 11th century. In fact, real doubt has been cast on some claims made by climate

scientists on this subject. For instance, it now looks as if there is not enough evidence to say the 1990s were definitely the hottest ever. However, although natural effects, such as solar activity, do affect global temperatures, sometimes significantly, an analysis of solar activity over the past 30 years would predict a fall in temperature rather than the opposite. In truth, there are no natural effects that could have caused the increase of 0.5 degrees C in temperature that has been observed in just 30 years.

The final redoubt of the sceptics is to challenge the extent of the threat produced by global warming. Here there is considerable scope for argument because both sides inevitably have to speculate about events far into the future, where reaching unequivocal conclusions is very difficult if not impossible. The Bush camp is increasingly concentrating its fire in this area. For instance, Myron Ebell, the US presidential advisor on the environment, says that "global warming is unlikely to be much of a problem". James Inhofe, Chair of the US Senate Environment Committee, says "increases in global warming may have a beneficial effect on how we live our lives".

The Intergovernmental Panel on Climate Change (IPCC), an international body of climate scientists, is currently predicting that the earth's temperature will rise by between 1.4-5.8 degrees C due to the action of greenhouse gases. The big range in this prediction, which could result in very different consequences at the two ends, is due to the inherent difficulties in making very long-range predictions, something the sceptics have latched onto, saying the uncertainty makes the whole exercise worthless. In fact, even a 1.4 degree C rise would mean the hottest ever temperature in the history of civilisation. What mainly lies behind this large range in predicted temperatures is the uncertainty of the action of the so-called feedback effect. The feedback can be either negative or positive. The negative type tends to reinforce global warming effects and the positive to diminish them. A possible example of negative feedback is one in which the role the oceans currently play in absorbing carbon dioxide is switched to one of emitting the gas. This could happen because, as sea temperatures rise due to global warming itself, the oceans' ability to absorb further carbon dioxide is reduced.

One of the very few credible sceptical climate change experts, Richard Linzen of the Massachusetts Institute of Technology, has used feedback arguments to back his case. He cites a possible positive feedback effect due to the drying out of the upper levels of the atmosphere. Water vapour is a significant greenhouse gas and so its reduction, again as a result of a temperature rise due to global warming itself, would reduce the greenhouse effect and lower temperatures. There is not much evidence to back this up but it is theoretically possible, according to a recent article in *New Scientist* magazine.

In a response to the sceptics, a review of the findings of nearly 1,000 articles on climate change in so-called peer-reviewed scientific journals (that is, papers that have been scrutinised by other leading scientists for their accuracy), by Naomi Oreskes of the University of California, San Diego, showed that there was a near universal consensus opposing the sceptics' position. The sceptics response to this is that

virtually all climate scientists are biased due to politically motivated, pre-conceived ideas, and some sceptics even allege an enormous conspiracy.

Even though evidence is mounting all the time, restricting the sceptics' room for manoeuvre, there is always going to be a degree of uncertainty about the long-term effects of human-induced temperature rises. This does not mean, though, that action does not need to be taken urgently. For example, consider the scientific controversy over the link between smoking and lung disease that stretched over decades, which has some similarities with the current dispute. The scientific 'deniers' of the link between smoking and cancer were often paid by the tobacco industry and the evidence at first was not completely clear cut, which gave them a chance to refute the claims of the anti-smoking lobby. Even now the exact mechanism of how smoking causes cancer is not fully understood, for instance, why some people smoke heavily all their lives and do not develop the disease. However, a lack of a complete picture did not prevent a scientific/medical consensus emerging that demanded decisive action be taken.

It is true that the uncertainties of predicting the effects of climate change, decades or even centuries in the future, are greater than those surrounding the smoking/cancer link, but the consequences of not taking action are potentially more disastrous, even threatening the continuation of life on the planet in the long term. For this reason, a precautionary approach needs to be taken, that recognises there will inevitably be uncertainties, but nevertheless demands decisive action now.

Renewable energy

ONE OF THE lines of argument of the sceptics in downplaying the seriousness of global warming is to argue that humankind will be able to cope with its effects using new technology. This raises the question of how likely is it that technology will emerge that will be able to solve the problem of global warming. Of course, renewable power generation technology exists now, such as wind, wave and solar power, but it is relatively expensive to introduce.

What the capitalist system is looking for is an invention that can generate sustainable energy that is as cheap, or almost as cheap, as using oil. In search of this 'promised land' research has continued for decades into the possibility of developing nuclear fusion as an energy source, with the potential to produce virtually unlimited amounts of power with no pollution. The basis of the technology is to try to harness the vast amount of energy that is released when atoms are fused together, which unlike splitting the atom, does not produce toxic radio-active waste. The leading capitalist countries realised early-on that international co-operation would be needed, because massive resources are required to give a chance of success in tackling this very complex problem. However, partly as a result of squabbling between the partners over who would pay what, over the deployment of the money, and over the long-term future of the programme, no decisive breakthrough has been made.

Another possible future sustainable technology is hydrogen fuel cells. (See *Socialism Today* No.75, June 2003) A fuel

cell is a device that uses hydrogen, or hydrogen-rich fuel, and oxygen to create electricity by an electro-chemical process, and if pure hydrogen is used as a fuel, only water is produced as a by-product, theoretically making it environmentally friendly. Fuel cells are currently being developed to power passenger vehicles, homes, commercial buildings, mobile phones and lap-top computers. They are more efficient than the combustion engines used to power cars and in themselves do not produce the greenhouse gases that cause global warming.

However, hydrogen does not occur in a usable form naturally, it has to be manufactured and stored, and to do this requires energy. A report from the Massachusetts Institute of Technology said that producing the fuel itself would involve substantial carbon dioxide emissions and concluded that these, coupled with the extra 'green' costs of fuel distribution, would cancel out any potential environmental advantages of hydrogen cells. But if the hydrogen that drives them is produced with renewable energy, fuel cells could be a useful green alternative to the present combustion methods used in motor vehicles or electricity generation. The money being put into developing them is relatively tiny, though. For instance, the US recently announced a \$700 million programme to develop fuel cells for cars that Bush predicted would take 20 years to bear fruit. Compare this to the \$2 billion that Ford spent recently on developing a single new (non-green) model.

To date, the capitalist market system has been unable to provide the scientific breakthroughs that are needed to transform energy production. One of the reasons is that the huge costs of developing the new approaches that are needed in the energy field deter most companies from entering the market. Also, since the lure of profits is still ultimately the reason for investment in new technology, it will be introduced in those sectors that are most profitable in the short and medium term, ie for fossil fuel technologies rather than for renewable energy generation.

Nuclear alternative

SO DESPITE THE climate change sceptics' Micawber-like optimism about new sustainable technology being developed, it is unlikely that any 'magic-bullet' invention will turn up in the short or medium term. However, one existing technology that they could turn to is nuclear power, which is relatively cheap compared to renewables and by coincidence does not produce greenhouse gases. It would be completely wrong though to assume that this option does not pose a serious threat to environmental sustainability, particularly linked to the problem of disposing of toxic waste. (A direct consequence of producing electricity with nuclear reactors is the accumulation of radioactive waste, uranium and plutonium. There is also a significant amount of plutonium produced for military purposes that has to be stored.)

Since this toxic material will be radioactive for 100,000 years, a safe method must be found that can be guaranteed to be secure for this period of time, a task that poses huge uncertainties and problems because it is difficult to predict what natural conditions will be so far in the future. If the material is buried, the onset of earthquakes in previously unaffected areas is possible, for example. If the radioactive

spent fuel is put at the bottom of the sea the integrity of the materials used as a storage medium will inevitably be uncertain after such a long time, possibly leading to seepage. Also, undersea volcanic activity could start, leading to the same result. These are some of the problems we have now in dealing with existing waste: to add to them by expanding nuclear power would be irresponsible. Apart from the dangers of toxic waste, continuing with nuclear energy will also pose the possibility of another Chernobyl-type disaster.

Despite the risks involved, most bourgeois politicians, including Tony Blair in Britain, are now covertly considering expanding nuclear power. This is because, unlike Bush and the climate sceptics, they are worried about the threat of global warming but know that renewable alternatives are expensive and introducing them will hit the profits of the companies whose interests they represent. The dilemma they face is well illustrated by Blair's current predicament. He is at present chair of the G8, the club of the leading industrialised countries plus Russia, and was planning to make the environment a centrepiece of the G8 summit at Gleneagles in June. To gain credibility for this tactic, the British government announced that it was setting a target to cut greenhouse gas emissions by more than the targets required by the Kyoto agreement to cut global warming. This would have resulted in a 20% rather than a 12% reduction in greenhouse gases from their 1990 levels. The European Commission was informed that this would be the UK target for the separate European permit-trading scheme that is running in parallel to the Kyoto system.

The UK's unilateral pledge was quickly followed by intensive lobbying by the bosses' organisation, the CBI, which said their members would be adversely affected by the stricter target, by being put in a non-competitive situation internationally. Blair quickly caved in under CBI pressure and told the EU that the British government wanted to go back on its earlier commitment. The Commission replied to say that this would be illegal under EU law and so Britain must stick to its original target, something that Labour has been forced to accept. However, according to press reports, the government intends to pursue the EU through the courts in order to have the less stringent target accepted, a process that will take years. In the light of this fiasco, it remains to be seen how much prominence Blair will give to the environment at the G8 summit, considering his yawning credibility gap over global warming.

There is a serious lesson lying behind this amusing embarrassment for Blair. The cost of the cuts being demanded with either target, soft or hard, is very minor compared to what is required for real sustainability, but even this small sacrifice was totally unacceptable to the big companies represented by the CBI. Their priority, and that of the Labour government that looks after their interests, is protecting their profits at all costs. Dealing with environmental threats, however potentially devastating, will always be low down on their agenda.