Editorial

The debate needs to cool down

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It seems to have been accepted that man has caused the climate of this globe to change for the worse. While few should doubt that man has been profligate with the earth's resources and criminal in the pollution that has gone unchecked, there can be a debate over the effect of these activities upon future climate. While none should doubt the need for action to be taken to seek renewable sources for power, a major reduction in the use of the finite reserves of fossil fuels and the elimination of pollution, there should be a debate over the reasons given for the political action being promulgated within the European Community. Those actions are laudable when applied to the need to husband scarce resources, when much of the fuel used is imported at a negative cost to the Community's balance of payments. But the justification may be the subject of challenge if the sole reason given is to prevent climate change.

Property is said to be a major contributor of carbon dioxide (CO_2) to the atmosphere. Housing, particularly in the UK is poorly insulated and ill-designed to minimise the amount of heating required to maintain a reasonable internal climate. It is in everyone's interest to improve the quality of housing in order to reduce emissions, reduce the consumption of fossil fuel and to reduce the cost of operating the home.

A chance remark — a humorous turn of phrase — left me wondering. What had been said was 'When there is rain and unusually cold weather it is referred to as "Climate Change", but when it is hotter than usual it is referred to as "Global Warming"'. We have come to accept man as being the cause of climate change to the extent that there is guilt in leaving lights on, guilt in driving a large car or guilt in being an imperfect custodian of one's children's future. The warmest winter since records began is said to be due to climate change caused by increased emissions of CO_2 due to man's imprudence. Nine of the past summers have been among the ten hottest since records began because of climate change caused by man. A storm, tornado, flood and tsunami, have been said by some to be the result of global warming. This acceptance of everything being put down to man's evil doings, irrespective of the outcome is the response one might expect from a totalitarian regime or the Spanish Inquisition, but is it the output of reliable scientific analysis.

It is incorrect to assume that all politicians are duplicitous, but the united voice of politicians to change transport, construction, consumption and pollution may justify some scrutiny of the reasons given if not of the common interest served by the actions that may be proposed. If the motor car is too great a pollutant, ration petrol. If the aeroplane is a contributor to pollution, ration aviation fuel. Raising cost by taxation simply diverts more money to a country's government, whereas rationing, effective, low cost, low tech in application reduces an exchequer's income. If the use of the threat of global warming is merely a justification for taxation increases, then the justification for such action should be the subject of closer scrutiny than has been applied to date. After all, if governments were intent on humanitarian decisions they would have ethical foreign policy.

The most common linkage between the activity of man and the rise in temperature levels is the link between CO_2 emissions and temperature change, the greenhouse gas (GHG) emissions concept.

If the actions of man have affected the climate on the planet, and with climate being a notoriously difficult concept to map or predict, how does one establish that there is a link, and if there is a link, what should be done? The scientific community is about 90 per cent certain that a link does exist even though man's contribution to CO_2 is about 1 per cent of the CO_2 emissions that occur.

Many chemical compounds found in the Earth's atmosphere act as 'GHGs'. Many gases exhibit these 'greenhouse' properties. Some of them occur in nature, such as water vapour, CO_2 , methane and nitrous oxide, while others are exclusively human-made (like gases used for aerosols). Industrial activity contributes about 6.3 billion metric tons (BMT) of carbon a year. Set against that is over 200 BMT contributed by decaying vegetation, flatulent cows, ocean evaporation, and natural fires and smoke emissions. At least half of the emissions of industrial activity can be taken up in the natural exchanges that take place.

'Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and sub-surface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability' (National Research Council Study, dated May 2001). This is the working arm of the United States National Academy of Sciences and the United States National Academy of Engineering who carry out most of the studies done in their names. So the theory that has been accepted by most governments is that man's activities have resulted in the accumulation of excess carbon in the atmosphere, the consequence of which is the increase in GHGs, which will therefore trap more heat.

These gases allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth's surface, some of it is reflected back towards space as infrared radiation (heat). GHGs absorb this infrared radiation and trap the heat in the atmosphere. This is an essential requirement, because without some entrapment of the heat the globe would cool. Over time, the amount of energy sent from the sun to the Earth's surface should be about the same as the amount of energy radiated back into space, leaving the temperature of the Earth's surface roughly constant. If that is so then small changes to this balance may have an effect on the levels of temperature. But changes do occur regularly through natural events such as volcano eruptions without the concomitant climate variations that the theory suggests.

To support this theory, graphs have been produced that track the temperature levels on the earth for over a 1,000 years and match that with the levels of CO_2 in the atmosphere. There is a marked similarity between the shape of the two graphs — temperature rises, so does the graph for CO_2 levels; temperatures fall, so does the level of CO_2 . The question is which causes what. Evidence has been put forward that confirms that warmer spells in the Earth's history occurred around 800 years before the rise in CO_2 levels. There are those who disregard this evidence by identifying, quite correctly, the changed circumstances that now exist — but no explanation is given as to the influence of these changes. It is also true that small increases in temperature lead to substantial release of CO_2 from the oceans, so that an early cause can create a later effect.

UK Carbon dioxide emissions rose in the first half of 2006, and are now at their highest level since Labour came to power, Friends of the Earth analysis of new Government energy figures reveals (DTI at page 39 of Energy Trends). *UK Government energy consumption figures for the first six months of 2006 are 2.1 per cent higher than the same period last year. And, if this trend is reflected in the second half of the year,*

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carbon dioxide levels will be approximately 4.4 per cent higher than 1997 . (This would mean that UK carbon dioxide emissions would be just 3.3 per cent below 1990 levels. When Labour came to power they were 7.4 per cent below 1990 levels.) (*Greenpeace*, 23rd October, 2006).

Global warming is seen by many as an excuse for EU commissioners to parish councils to change the way we have been living. Some of this advice, and attempts at lifestyle control, are sound. Some are not.

There have been recent increases in atmospheric CO_2 , but some identify the cause as being anthropogenic, with little evidence that man-made increases of CO_2 are driving temperature change. In the 1970s, the climate concern was of falling temperatures because global temperatures had fallen for four decades. Soon afterwards the current trend of rising temperatures began. This, claim the sceptics, is a flaw in the CO_2 theory, because the post-war economic boom produced more CO_2 and should, according to the consensus, have meant a rise in global temperatures (*National News*, 4th March, 2007). The falling temperatures are, however, believed to have been caused by the release of sulphate aerosols — particles that have a cooling effect on the atmosphere, and this was contained at an industrial (and not a consumer) level. Governments and industries agreed to replace CFCs with safe substitutes and the crisis was contained (*Guardian* , 4th March, 2007).

Melting sea ice in the Arctic is enabling ocean waters to soak up more CO_2 from the atmosphere. Ice retreat over the last 30 years has tripled the amount of CO_2 the Arctic Ocean can absorb. (*Bermuda Institute of Ocean Sciences calculated CO_2 uptake in the Arctic Ocean from measurements taken from the Chuckchi Sea and Canada basin in 2002 and 2004. They found that CO_2 uptake from the atmosphere increased dramatically during the summer months, when sea ice was at a minimum* ; Geophysical Research Letters, DOI: 10.1029/2006GL027028). Overall, they calculated that the entire Arctic Ocean is currently able to absorb up to 66 million tonnes of CO_2 per year or about 10 per cent of current industrial output. Future ice-melt may increase absorption by a further 20 million tonnes per decade (Issue 2585 of *New Scientist* magazine, 8th January, 2007, p. 16).

The UK Government has set targets to reduce GHG emissions by at least 12.5 per cent by 2012 and 60 per cent by 2050 compared with the baseline emissions of 1990. Compared with other countries, these are very ambitious targets and provide international leadership in tackling global warming. It has also set policy aims to achieve significant cuts in GHG emissions by 2020. In the DEFRA Climate Change Review (2006), the policy projection was to achieve a cut in GHGs of about 20 per cent by 2020. In the subsequent DTI Energy Challenge Report (2006), additional policies are estimated to add extra savings.

The recent report produced by UCL Environment Institute assesses the UK Government's current policies to reduce carbon emissions and the likelihood of achieving their stated targets and policy aims. The report provides a historic policy audit to assess whether government policies have been able to reduce carbon emissions since their introduction. It reviews policies in terms of whether they will deliver significant reductions in the future. The report's focus is on the carbon reduction targets of the UK Government for 2012 and 2020. It reviews the four major sectors of Energy Supply, Business, Domestic and Transport.

The major findings of this report are as follows:

1. UK GHG emission target of a 12.5 per cent cut on the baseline levels required by the Kyoto Protocol by 2012. About 183 megatons of carbon equivalent gases (MtCe)

could be achievable. UK GHG emissions in 2005 were 14.7 per cent below 1990 levels (DEFRA, 2007). The government is, however, aware that with continued significant economic growth the UK emissions will start to rise after 2010 and are implementing policies in the Energy Challenge Report (2006) to try to ensure this does not occur.

2. The audit notes that most of the carbon emission reductions to achieve the Kyoto Protocol targets were made in the 1990s with the change in industrial processes, waste management and a switch to natural gas from coal.
3. The major problem faced by government policies is trying to reduce overall carbon emissions against a background of sustained and significant economic growth. For example, there is predicted energy 'gap' of 25 GigaWatts, which will be required by the UK in 2020, as well as the predicted huge growth in car usage over the next 13 years.
4. This report has assessed the likely success of each of the government policies and produced a possible range of GHG reductions for 2020 of between 29 and 17 MtCe for the four main sectors. This is significantly lower than predicted by the DEFRA Climate Change Report (2006) and DTI Climate Change Report (2006).
5. With present policies, it is suggested that the government's implied policy aim of cutting 2020 GHG emission by up to 30 per cent compared with 1990 levels is very optimistic. This audit suggests that current policies would achieve a GHG emission reduction of between 12 and 17 per cent by 2020.
6. Despite all the complications within each sector reviewed, the over-riding reason for the possible failure of the current government policies to achieve their stated targets is that nearly all of them are voluntary(UCL Environment Institute: Environment Policy Report Number 2007:01, Published: 4th March, 2007).

In February 2007, the official Intergovernmental Panel on Climate Change (IPCC) — which brings together almost all the world's leading scientists in the field and all its governments published the first instalment of its latest massive 'assessment report', concluding that it was 90 per cent certain that human activities are heating up the planet. The conclusion was all the more authoritative as the IPCC is a cautious body that acts by consensus; all governments, including the United States, have to agree with its conclusions.

Some scientists still disagree but their numbers are diminishing. The measurements of what has happened are clear, and the basic science has been established, unchallenged for 180 years. It is reasonable to conclude that it is 'highly likely that carbon dioxide emissions' have played a significant part in heating up the Earth.

> 'New Government figures [Greenpeace 26 February 2004] indicate a big increase in greenhouse gas emissions in 2003. The increase was caused by a rise in energy consumption and a return to coal burning. Friends of the Earth calculated that compared to 2002, emissions of carbon dioxide from energy rose by approximately 3 per cent in 2003. This is huge increase in one year, especially as the Government has promised a 20 per cent cut in carbon dioxide levels by 2010 (based on 1990 levels)'.

The year 2004 was the coolest of recent years, breaking a sequence of nine successive years of record with high levels of temperature.

What should one conclude? Does a debate remain as to whether the very small percentage contributed by man's activity has been critical in effecting the change.

– We are living in a period of rising levels of temperature, which, although they have occurred naturally in the past, may have been influenced by man's activity.

- CO_2 emissions occur naturally, and natural emissions account for about 97 per cent of these emissions. CO_2 has been soaked up by the oceans, vegetation and other actions, and may be able to soak up the small percentage increase that is taking place at the moment (on the other hand, they may not be able to do so, which, if true, may result in a small increase in CO_2 levels year on year).
- Man's contribution to the levels of CO_2 emissions although small in percentage terms, have been increasing and could have affected the surplus levels of CO_2 in the atmosphere.
- Warmer temperatures create greater levels of CO_2 emissions, and those temperature increases have occurred naturally in the past, but man-made small temperature changes can cause greater levels of CO_2 emissions to develop.
- If the activity of man has caused or contributed to the increase in temperature levels, it is prudent to take steps that will reduce that affect, particularly if the steps reduce the levels of consumption of a finite reserve of the Earth's fossil fuels.
- Such steps would result in most Western Governments becoming less dependent on the supply of fuels from politically unstable areas of the Globe, with the risk of supply fluctuation and price instability.
- It is in the interest of Western Governments to believe in climate change as a justification for unpopular policies which, dressed up as they are, have a modicum of public support.
- It is in the interests of men and women to change their recent habits for their own financial well-being, and in so doing they may reverse a climate trend that might exist.
- No reasonable person should take the risk with the future by denying the need for change, but the case for the need for change has not yet been proved.
- The current steps being taken are not producing the reductions that are claimed by the UK Government — it is likely these will only be achieved by imposing changes in lifestyle and consumption.
- If one waits for proof of climate change, and man's activities are the cause of that change, it may be too late to reverse the trend before the consequence of variations in climate have irreversibly damaged the world we have become used to.
- It is too great a risk not to change, when even if the justification for the change is found not to have been necessary, the consequence is in the interest of the public, not to mention the body politic.

If this is right, we can expect legislation to be introduced to enforce changes in construction, to limit carbon fuel consumption and to control the freedoms we have enjoyed to date.

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