

## **ENERGY MANAGEMENT GROUP NEWSLETTER**

### **Introduction**

Welcome to the autumn 2005 edition of our newsletter with listings of energy events, notes on energy in the media and politics and some more climate change articles. We hope that you find these useful and interesting. As ever, if you wish to contribute any material to the newsletter or have any comments on its content please contact the group secretary, Yasmin Andrew (Yasmin.Andrew@jet.uk). The next edition of the newsletter will be published in January and the deadline for contributions is the end of November.

### **Bursaries**

We would like to remind group members that they can apply for bursaries to contribute towards the cost of attending energy related seminars or conferences. To apply for a bursary please contact Yasmin Andrew (Yasmin.Andrew@jet.uk), detailing the event you wish to attend, costs for which you are seeking support and reason for application (e.g. priority may be given to those not in employment or for whom travel costs are a particular obstacle for certain events).

### **Energy Management Group Events 2005**

**The following events are being organised for EMG members this year:**

#### **Energy - the big issues**

Date: 10:30-15:45 Tuesday, 25<sup>th</sup> October 2005 Venue: IOP HQ in London

Note that the AGM of the Energy Management Group of the Institute of Physics will take place during the lunch break.

#### **Outline for the day**

*'Towards Sustainable Consumption and Production'*, Sir Brian Heap, University of Cambridge

*'Energy Security of Supply – The CBI View'*, Dr. Jon Bird, CE Electric UK

*'Energy Now and Energy for the Future'*, Mr James Smith, Chairman, Shell UK)

*'The Nuclear Renaissance: Business Opportunities and Risks'*, Prof. John Gittus, Chaucer Holdings plc

*'Prospects for Fusion'*, Sir Chris Llewellyn Smith, UKAEA

*'The Global Energy Crisis: Peak Oil Meets Global Warming'*, Jeremy Legatt, Solar Century

## Conferences and Events

### **'Wind Power: Carbon Free Electricity', Dr. Derek Taylor**

Date: 6:30 pm, 2<sup>nd</sup> November 2005 (coffee from 6pm)

Venue: IoP HQ in London

Contact Prof. N Mason (01908 655132, e-mail: [n.j.mason@open.ac.uk](mailto:n.j.mason@open.ac.uk))

Organised by the London and South East Branch of the Institute of Physics.

### **'The Institute Strategic Plan 2006-2010', Dr Robert Kirby-Harris, Chief**

Executive of the Institute of Physics

Date: 6:30 pm, 16<sup>th</sup> November 2005

Venue: IoP HQ in London.

Contact Prof. N Mason (01908 655132, e-mail: [n.j.mason@open.ac.uk](mailto:n.j.mason@open.ac.uk))

Organised by the London and South East Branch

### **'Promoting a sustainable energy culture in Europe',**

Date: 22 -23 Sept. 2005

Web: <http://www.energy-services.ie/conference/index.htm>

### **'World Renewable Energy Council/Network (WREN) International Seminars in Britain'**

Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment

Date: 15-20 October 2005

Venue: Old Ship Hotel, Brighton

Web: <http://www.wrenuk.co.uk/brighton05.html>

### **14th European Biomass Conference and Exhibition: Biomass for Energy, Industry and Climate Protection**

Date: 17-21 October 2005

Venue: Palais de Congres, Paris, France

Web: [http://www.conference-biomass.com/Biomass2005/Welcome\\_intro.asp](http://www.conference-biomass.com/Biomass2005/Welcome_intro.asp)

### **European Wind Energy Conference & Exhibition,**

Date: 27<sup>th</sup> February - 2<sup>nd</sup> March 2006

Venue: Athens, Greece

Web: [www.ewea.org](http://www.ewea.org)

### **Energy Choices**

Date: 1<sup>st</sup> December 2005

Venue: Church House, Westminster

Organised by BNES and NIA, Tel: 0207766 6640

### **Sustainability for Engineers**

Date: 4<sup>th</sup> November

Venue: IMeche, 1 Birdcage Walk, Westminster

Contact Helen Quinn , e-mail: [h\\_quinn@imeche.org.uk](mailto:h_quinn@imeche.org.uk)

### **Fluid Machinery for Wave and Tidal Energy**

Date: 19th October 2005

Venue: IMeche, 1 Birdcage Walk, Westminster

### **World Conference on Physics and Sustainable Development.**

Date: 31st October to 2nd November 2005

Venue: Durban, South Africa

Organised by IUPAP, web: <http://www.iupap.org>

**NIA visit to Bulgaria** takes place 3<sup>rd</sup> – 7<sup>th</sup> October 2005.

The Nuclear industry Association will be using this visit to see for themselves the opportunities in the nuclear market in Bulgaria.

### **‘When the lights go out: Power to the people’, Professor Maxwell Irvine, University of Manchester**

Date: 6:30 pm, 18<sup>th</sup> October 2005 (Tea/coffee from 6.00pm)

Venue: CCLRC Daresbury Laboratory

Contact: Ann Marks e-mail: [liviop@amarks.co.uk](mailto:liviop@amarks.co.uk)

Professor Irvine has been invited to chair a committee of enquiry into energy policy and he will give a presentation which will be followed by a panel-led discussion chaired by Professor Paul Nolan, Dept of Physics, University of Liverpool. Panel members will be: Professor Mike Poole, Daresbury Laboratory and Stan Kewley, former CEO of Manx Electricity Board  
*This will be a joint meeting between the Merseyside and Manchester Branches of the Institute of Physics and both the Cheshire and Manchester Branches of the Institute of Electrical Engineers.*

All who attend the meeting, are welcome to a buffet after the discussion.

### **Professional Development 2005**

Date: 24<sup>th</sup>–25<sup>th</sup> October

Venue: IoP HQ in London

For information and to register go to: <http://careers.iop.org/pd2005>

This is a two-day development conference about exploring your own skills and talents and enhancing your ability to work in different situations within your organisation.

### **Useful web site:**

<http://www.energy-choices.com>

Although this is a nuclear web site, it also considers all other energy alternatives in a fair assessment.

### **2005 Digest Of UK Energy Statistics Statistical Press Release**

The 2005 Digest of United Kingdom Energy Statistics is published today (Thursday, 28<sup>th</sup> July 2005) by the Department for Trade and Industry.

With many detailed tables, supported by charts and commentary, the Digest provides comprehensive data for 2004 and an account of trends in energy supply and demand in the United Kingdom. The Digest is available both in hard copy from the Stationery Office and free on the Internet at [www.dti.gov.uk/energy/inform/dukes/](http://www.dti.gov.uk/energy/inform/dukes/). Included with the Digest this year are the popular booklet "UK Energy in Brief" (which summarizes the latest energy statistics in 29 Charts) and the 2004 "Energy Flowchart" (which illustrates the flow of fuels from production or import to eventual final use).

In addition, data for 2004 in Energy Consumption in the United Kingdom are also released today on the Internet by the Department for Trade and Industry. This publication brings together statistics from a variety of sources, providing a comprehensive review of energy consumption in the UK since the 1970s. Energy Consumption in the United Kingdom is available on the Internet at [www.dti.gov.uk/energy/inform/energy\\_consumption/](http://www.dti.gov.uk/energy/inform/energy_consumption/) where detailed tables can also be found.

### **Some Statistics from the 'DIGEST OF UK ENERGY STATISTICS 2005'**

\* Overall there was a decrease in indigenous energy production of 8-1/2 per cent and an increase in primary energy consumption of 1 per cent in the UK during 2004.

\* As a result, overall primary fuel consumption was not met by indigenous production and the UK became a net importer of fuel for the first time since 1992. The UK was a net importer of coal and gas but remained a net exporter of oil.

\* Increased energy consumption and lower nuclear output meant that, provisionally, emissions of carbon dioxide rose by 1-1/2 per cent in 2004.

\* A lower gas-coal price differential decreased the commercial attractiveness of coal for electricity generation, and increased the amount of electricity generated from gas. Gas accounted for 40 per cent of electricity generation.

\* Refinery output increased by 6 per cent and petroleum product exports increased by 30 per cent.

### **ENERGY - ITS IMPACT ON THE ENVIRONMENT AND SOCIETY**

Also available from today (28<sup>th</sup> July 2005) is an updated, but shorter, edition of this booklet (first produced in July 2002) that looks at the social and environmental impacts of the production and use of energy. It is available in full on the DTI Energy web site.

### **BOOK REVIEW**

**State of Fear** by Michael Crichton

This is fiction but is full of references to scientific work on climate. The main theme is that a group of terrorists are planning to induce catastrophic events such as tidal waves and floods deliberately to support claims that man's

activities are changing the climate. The methods suggested sound plausible but far fetched, however the main interest to EMG members may be the discussions between the characters about responsibility for climate change. The 'heroes' are sceptics who do not believe that carbon emissions are affecting the climate - they maintain data is being selected to substantiate the man – made global warming theory and data **not** supporting it is ignored; researchers who aim to show that man-made warming does **not** exist do **not** get funded. Politics is driving events not Physics.

The 'villains' are those with a political agenda to keep the populations of countries in a 'state of fear' (the reason for the title) that something catastrophic will happen if they do not change their lifestyle. The story is the battle to stop these events being triggered. Crichton makes his own views clear that he does not support the current climate change story and has extensive sets of graphs and tables to 'prove' his point. I found it a good read especially as it reinforced all my opinions about the climate change debate ! See Sonjal's piece later on –she would no doubt support Crichton.

Richard Bloodworth, EMG Committee

## **Energy in Education**

Energy plays an important part in school science at all levels. Introductory stages refer to energy as 'that needed to make things go' or 'what we all need to live' etc. The different forms of energy are explained such as chemical, electrical, elastic, heat, light, sound, kinetic, gravitational potential and nuclear. The idea that useful work is done when one form changes into other forms is discussed with many examples e.g. for a petrol engine driving a car it would be chemical (in the petrol) changing to heat and light (in the engine), changing to kinetic energy if the car is accelerating. In chemistry the idea of chemical bonds being broken and made is used to explain exothermic and endothermic reactions. In biology energy from food of different kinds and from photosynthesis are discussed.

At higher levels the interchange of kinetic, potential, electrical and thermal energy are calculated for example in working out electricity bills in the home. The idea of conservation of energy is discussed (usually briefly!) as the idea that energy cannot be created or destroyed but only changed from one form to another. Heat energy is discussed as the end point of all energy changes so that the end result of our energy consumption is the production of heat, which is then radiated away into space. There are also are brief mentions of energy resources for coal, oil, nuclear and renewables such as wind & tidal energy with their advantages and disadvantages (this overlaps the geography lessons a bit).

It is fair to say that most school students find most of the above difficult particularly as the Joule is not a unit in common speech, diets etc all seem to refer to calories which makes for confusion. However, with the more able I can sometimes discuss mass/energy relations and the idea that all energy has mass associated with it (so charging a battery makes it more massive) so

that energy and mass are similar (mass has been described as compactified energy).

Richard Bloodworth, EMG Committee

## **Energy News**

### **Climate change**

In the July issue of Scientific American, there is a report on a new study from NASA that indicates that the earth is retaining more of the sun's energy than it is sending back into space. This simulation is conducted by James Hansen of the NASA Goddard Institute for space studies. It takes into account such climate forcing variables as greenhouse gas and aerosol concentrations, land use and surface reflectivity and calculates global temperatures and other climate values for the atmosphere and the oceans. The model simulates climate change 1880 to 2003. The results indicate that the earth is absorbing a net amount of energy of about 0.85 watts/m<sup>2</sup>. This imbalance if not countered could cause additional warming of 0.6°C by the end of the century. While this is not as much as that expected from the use of energy by man it is still significant and clearly should not be ignored.

The Scientific American web site is [www.sciam/ontheweb](http://www.sciam/ontheweb)

### **Katrina**

The American Petroleum Institute states that 58 oil rigs have been damaged or displaced, 30 have been lost and 10 major US refineries have closed. The International Energy Agency has sent several tanker loads of petrol from European reserve stocks to the US.

### **Fusion power**

The world's first nuclear fusion reactor is to be built in France. Work on ITER (International Thermonuclear Experimental Reactor) will begin next year at Cadarache near Aix en Provence. The £7 billion prototype is the most expensive international science collaboration after the International Space Station. Japan which was also in the running withdrew but is given a special brief to develop materials for the reactor core which will withstand the high temperatures.

### **Natural gas and oil prices (report late June 05)**

World oil prices have touched \$60/barrel with predictions of \$70/barrel and more to come (report Financial Times, 26<sup>th</sup> June 2005). The G8 summit in Edinburgh already has rising oil prices top of the agenda. Will the prediction by Matt Simmons former energy adviser to President Bush of possibly £100 a barrel come true? Continuing rapidly rising oil prices fuelled by increasing demand world wide will have a detrimental effect on world economic development. The margin between supply and demand is the narrowest it has been for many years with the oil producers such as OPEC pumping oil at near capacity levels. Such a narrow margin means that the market is susceptible to local changes. The Kiel Institute for World Economics warned that if there is a local physical or political unwelcome development such as a

supply disruption in Russia or a political problem in Saudi Arabia then the price could escalate. The market will respond to such occurrences. The lack of enough refining capacity is another factor affecting prices. The crisis is demand led with China and India leading the rush for oil. It is not a supply problem. The oil price will not fall until demand starts to fall and there is no sign of that.

Gas prices are also rising fast with the wholesale price of gas in the UK increasing rapidly over the last year. The price has more than doubled since this time last year with gas reaching the record price of 80p a therm last week (report Financial Mail, 26<sup>th</sup> June 2005). Continental gas companies have a virtual monopoly that keep gas export prices high. High gas prices will inevitably lead to high electricity prices as unlike nuclear electricity where fuel costs represent only 18% of the unit cost, gas fired CCGT electricity generators have a fuel cost of 60% of the unit cost. Already the price of electricity for next winter is running at a record £51.80 per MWh, three times the level charged in the winter of 2003. Domestic electricity bills have gone up by nearly 20 percent over the last 18 months. Fuel costs are by far the larger proportion of the overall electricity cost for a electricity gas fired generator unlike a nuclear generator where the fuel cost is much smaller and so has much less effect. The rise in the cost of gas must put a question mark over the strategy of depending on foreign gas for electricity generation.

### **Oil resources**

The search for new oil resources is being keenly watched. On the one hand there are the optimists like BP who have estimated that there is at least 40 years worth of oil left and enough gas to last a further 30 years (Business Telegraph 15<sup>th</sup> June 2005). Peter Davies BP chief economist and author of the reliable BP Statistical Review of World Energy 2005 says that the 4.3pc growth in world energy consumption last year was the largest ever annual increase in global primary energy consumption (report by Christopher Hope Business Telegraph). Last year the Chinese economy grew by a staggering 9.5 % with energy consumption having increased by 65 % since 2001. Davies insists that the present high oil prices are not a result of lack of oil resources, he says "proved reserves of oil gas and coal remain more than adequate to meet the worlds growing needs". The unanswered question is at what acceptable price can new reserves be exploited? Against the optimism of companies like BP a more pessimistic view is taken by energy consultants Wood Mackenzie who state that the major oil companies have failed to improve the yearly exploration yield of new reserves. The Wood Mackenzie report Global Oil and Gas risks and rewards shows that typical annual returns from oil exploration (between three and five billion barrels) have not changed since the early 1990`s. The only exception being the large 10 billion barrel oil field discovered in 2000 in Kashagan in the Caspian Sea. The message from Wood Mackenzie is that it is becoming increasingly difficult to find new oil resources. While there have been successes in the gulf of Mexico and Nigeria there have been failures such as in Brazil where there has been no commercial discovery in spite of the oil companies spending \$1.5 billion. Exploration drilling peaked in 1998 with 725 wells drilled but in 2003 the West oil industry completed only 554 wells. The push at present by the big western

oil fields is to go into Alaska and Siberia (report by Carl Mortished, International Business Editor, TheTimes Business, 14<sup>th</sup> June 2005).

### **Natural gas**

The first cargo of liquefied natural gas (LNG) arrived in the Thames Estuary at the Isle of Grain on 4<sup>th</sup> July from Algeria (report in the Times, 4<sup>th</sup> July 2005). The Times report records that BP is believed to have diverted cargoes of Algerian LNG earmarked for the Isle of Grain to the US where gas sells at a much higher price! This begs the question, given that the US dependence on foreign oil and gas is rapidly increasing, will there be a price war between the UK and the US for much needed LNG?

### **Bush Supports Expansion of Nuclear Power:**

A fortnight after Mr. Blair visited Washington, Mr. Bush visited the Calvert Cliffs nuclear power station in Maryland. He said " Maryland has looked to Calvert Cliffs to keep their lights on and to keep their land, air and water clean. In other words you are generating electricity and helping the environment. People have got to understand that advances in science and engineering and plant design have made nuclear plants far safer than ever before. There is a growing consensus that more nuclear power will lead to a cleaner safer nation. In the 21st century our nation will need more electricity, more safe clean reliable electricity. It is time for this country to start building nuclear power plants again" (Sone magazine, June 2005).

### **Quotations**

**Waste:** Professor Peter Smith, special professor of Sustainable Energy at Nottingham University is quoted in the Independent on 26<sup>th</sup> April 2005 as saying that from trends in energy demand and the need to reduce emissions a nuclear contribution is unavoidable. He added, "Research at Sheffield University has demonstrated how high level waste can be safely stored in 4-5 kilometre deep boreholes where its heat melts the rocks. As the rocks cool they re-crystallise, sealing in the waste. The risks associated with nuclear are indeed minute compared to the damage that will be the consequence of uncontrolled climate change"

**Choice:** Professor Philip Stott, Emeritus Professor of Biogeography at London University is quoted in the Times of April 12 "It's this simple, wind farms the size of London or clean safe nuclear plants"

### **Environmental leader Professor James Lovelock goes for nuclear:**

Professor Lovelock has been the recognised leader of the green lobby for decades, in an interview with the Observer on 22<sup>nd</sup> May 2005 he says "We have no option but to use nuclear power. I don't repent for having this view because we have no alternative." (Sone magazine, May 2005.)

**New American led climate deal:** a new initiative to combat global warming has been unveiled based on the development of new technology. Countries signed up to this include the United States, Australia, China, India, South Korea and Japan. It is called the Asia-Pacific Partnership on Clean Development and Climate. The view of many outside Kyoto is that Kyoto

penalises industrialised nations by not including the developing nations and that it threatens jobs. The new initiative does not set targets for emissions, it calls for new technologies from clean coal and wind power to a new generation of nuclear reactors. The Australian prime minister John Howard is quoted as referring to the new initiative as “historic and superior to Kyoto” (report by Alec Russell, Charles Clover and David Rennie Daily Telegraph, 29<sup>th</sup> July 2005)

**The Times 8 August** “In France, Japan, China and meticulously cautious Finland, debate has been joined and the public convinced..... but all the British public has to go by is an unsatisfactorily ambiguous 2003 white paper that, without ruling out nuclear energy, led people to believe, mistakenly, that energy saving combined with renewable energy could plug the yawning gap between supply and demand.”

**Electricite de France (EDF)** has announced its plans to build at least one 1600 MWe EPR a year starting in 2020 to replace its existing nuclear stations. It has 58 commercial reactors. Consultation on the construction of a demonstration EPR at Flamanville will start in October. EPR is the European Pressurised Water reactor. EDF says that nuclear will offer economic performance, stability of costs and environmental benefits. The French company Areva is building its first EPR in Finland. (Sone newsletter Aug 2005.) Areva is the company of Bertrand Barr, the chair of SAGNE at the IAEA in Vienna and a regular speaker at Energy Management Group energy seminars.

**Exxon-Mobil** has predicted that non-OPEC oil will reach its peak within five years. (Sone newsletter).

#### **South Korea commissions its 20th nuclear reactor.**

This is the last of a string of six 950 MWe reactors known as the Korean Standard Plants. South Korea now has 16 pressurised water reactors and 4 Candu type heavy water reactors in operation with a total capacity of 16 500MWe. South Korea is now a major player in commercial nuclear power (Nuclear Issues).

## **Climate change**

### **Note from Peter Gill ([gill.pf@virgin.net](mailto:gill.pf@virgin.net))**

*The next piece is by Dr Sonja Boehmer-Christiansen, Reader in Geography at University of Hull. Dr Boehmer-Christiansen is the editor of an environmental journal. As a “green” she had special access to IPCC for many years and therefore can offer a special insight into the way IPCC operates. Initially I sought only Dr Boehmer-Christiansen’s permission to reproduce a piece published in Energy World. However when I provided a copy of our Summer Newsletter she chose to respond to the article by Simon Roberts and Jake Hacker from Arup instead.*

### **Should we base energy policy on IPCC predictions?**

I have been invited to participate in a discussion of global warming in your newsletter. Let me start with two quotations before considering seven errors or misinterpretations in the Roberts-Hacker article in Issue 16.

*“Climate science, having substituted computer games for reality, is indeed in a sorry state.”<sup>1</sup>*

and

*“Almost unnoticed, the theology of global warming has in recent weeks suffered a number of setbacks. In referring to the theology of global warming, one is not focusing on evidence of the earth's warming in recent decades, particularly in the Arctic, but rather on the widespread insistence that such warming is primarily a consequence of man's activities -- and that, if only we collectively had the will, we could alter our behaviour and stop the warming of the planet. It was Michael Crichton who pointed out in his Commonwealth Club lecture some years ago that environmentalism had become the religion of Western elites. Indeed it has. Most notably, the burning of fossil fuels (a concomitant of economic growth and rising living standards) is the secular counterpart of man's Original Sin. If only we would repent and sin no more, mankind's actions could end the threat of further global warming.... By implication, the cost, which is never fully examined, is bearable. So far the evidence is not convincing. It is notable that 13 of the 15 older members of the European Union have failed to achieve their quotas under the Kyoto accord -- despite the relatively slow growth of the European economies. The drumbeat on global warming was intended to reach a crescendo during the run-up to the summit at Gleneagles. Prime Minister Blair has been a leader in the global warming crusade. (Whether his stance reflects simple conviction or the need to propitiate his party's Left after Iraq is unknown.) .... On the eve of the summit, the Economic Committee of the House of Lords released a report sharply at variance with the prevailing European orthodoxy. ...”<sup>2</sup>*

This House of Lords report has been called ‘eccentric’ by Lord May (FT 29 July 2005), a former civil servant -- scientific advisors are no longer neutral but are expected to defend government policy -- now heading the Royal Society. This august body, sadly, has become a lobby for (anti) global warming activism on the assumptions that climatic change is man-made, dangerous and controllable. The truth of all three assumptions urgently needs an open debate among natural scientists from many disciplines, social scientists, engineers and statisticians before the public is being alarmed by future catastrophes and coaxed to change behaviour by half-backed appeals to planetary ethics.<sup>3</sup> I have interviewed far too many people, including climatologists who say one thing in private and another in public.<sup>4</sup>

I would strongly encourage interested readers to study this report, especially its volume of evidence. It will soon become transparent that the economics of climate

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<sup>1</sup> Prof. R.M. Carter, Marine Geophysical Laboratory, James Cook University, Australia; email to [climatesceptics@yahoogroups.com](mailto:climatesceptics@yahoogroups.com), 22 August 2005)

<sup>2</sup> (James Schlesinger, *The Wall Street Journal*, August 8, 2005)

<sup>3</sup> Sonja B-C: *Environmental Politics* : ‘Investing Against Climate Change: Why Failure Remains Possible’, Autumn 2002; 11(3), pp.1-30; *Geoforum*: ‘The geo-politics of sustainable development: bureaucracies and politicians in search of the holy grail’, 33 (3), summer 2002 .351-366; and *Journal of Science, Technology and Human Values*: ‘Science, Equity and the War against Carbon’. Winter 2003.28 (1) , pp.69-9.

<sup>4</sup> With A. Kellow, Hobart, *International Environmental Policy: Interests and the Failure of the Kyoto Process*, Edward Elgar Publishing, October 2002

change are firmly linked to IPCC science predictions, and that the science is anything consensual. Government advice does indeed come from experts, but are these not by definition 'loyal servants of authority'? Both sides in the climate debate (pro and anti IPCC) were indeed called as witnesses, allowing readers to make their own 'vested interest' analysis of the presented positions and indeed, of the dependence of these position on mathematical model constructed by the witnesses. Readers might however need reminding that policy relevant research agendas that fund specific projects, e.g. dangerous global warming or the shrinking of glaciers, are profit-making enterprises that must sell 'relevant' knowledge in order to survive in a competitive market place.

But to Roberts and Hacker! I would like to make seven comments on assertion made in this article.

First, why differentiate between global warming and climate change? The world has been warmer, or at least as warm – if the proxy-data can be believed - during historical times and much warmer and colder during geologic time. Correlations with levels of carbon dioxide are not convincing, nor are links with recent levels and emissions from combustion, but this is a matter of scale and judgement, both hampered by a poor understanding of several carbon cycles. Until we really understand climate change, we can only speculate about any human contribution. It is quite easy to admit such a contribution without seeing this almost entirely in the combustion of fossil fuels. The Gaia school of ecologists, especially strong in Russia, has quite different ideas. The biosphere becomes much more important as the regulator of climate. It is not modelled by the IPCC. Until a few decades ago, past climates were the province of geology. There is very little communication, and growing hostility, between these two branches of knowledge. (This hostility may be declining as geology is now funded to study carbon dioxide sequestration into rocks.

Second, in what sense is the IPCC objective and authoritative? I have my doubts about both. Its science comes primarily from government-funded institutions (including self-interested bodies like UNEP and WMO) which require policy relevant threats for their continuous funding by national governments. IPCC pronouncements, from the very start, served to 'underpin' a legal instrument, the Climate Treaty (1992) and its Kyoto Protocol (1997), which do not serve to study climate but assume anthropogenic and dangerous 'average' global warming. They were directed against fossil fuels from the start and hence have close links to energy policy, with the solutions being part to the IPCC research effort. The energy policy (and now sequestration) are discussed and advocated by working group III of the IPCC, a body that is also guided from within the UK. This third group, not the ones of science and impacts is probably the 'driver' of IPCC actions. It keeps out of the limelight, but is the forum for 'non-scientific' NGOs, technologists and energy specialists appointed by a small number of developed countries.

However, the evidence that these international agreements (de facto on energy and agriculture, and potentially transport) are needed urgently 'to save the planet' does not come from observation and a genuine interdisciplinary effort, but from simplistic models and statistical analyses that do represent the complexity of climate and economic growth. The climate models all assume a doubling of carbon dioxide in the atmosphere – which may never happen – by linking natural science to economic

growth scenarios, that is to highly debatable assumptions about social data that are also currently under attack.<sup>5</sup> Nevertheless, these models and current developments are indeed the best tools we have for experimenting with the causation of climate, but are they good enough for major policy interventions that hand vast powers to centralising bureaucracies? Before agreeing with this, the motives of bureaucracies for supporting mitigation actions and the likely outcomes of such major regulatory efforts need to be closely examined.

It should be remembered that the IPCC was initiated by a handful of governments after research lobbies (Harvard, ICSU, WMO) has sounded the alarm. UNEP needed work. The IPCC started functioning effectively when an era of high fossil fuel prices (the so-called oil crises of the 1970 ideologised as 'limits to growth' by Club of Rome) ended in the mid-1980s and threatened past investments and new technologies. An urgent search for means to increase the cost of fossil fuels started as nuclear power, renewables, energy efficiency, energy conservation all stood to suffer from a new era of cheap fossil fuels. Environmentalism globally applied came to the rescue. The 'ethics' for making energy artificially high were soon in place with the IPCC providing the rational justifications via dubious 'predictions' based on assumptions that remain debated outside its own 'community'.

Third, it is not true in practice that the IPCC merely reviews scientific information. Official funding for climate research (at national level) is too closely tied to policy and the politicisation of science too obvious and acrimonious (see the journal I edit for evidence over last decade) to make this claim credible. The IPCC is not an objective advisor but an important, behind-the-scene actor engaged in the creation, selection and interpretation of officially 'useful' knowledge. The links are inside national bureaucracies and between these and intergovernmental bodies. Both national and intergovernmental bureaucracies use and fund green NGOs as required.

Fourth, is not entirely true (and rather an official DEFRA myth) that global warming pits environmental lobbies against the fossil fuel industry. Enron was a main supporter of Kyoto, and so are many energy companies. While the confrontation may be true for coal where substitutes are available, energy companies with gas interests or renewables divisions stand to gain immediately. Switching to gas is the easiest and once profitable way to reduce CO<sub>2</sub> emissions, and significant subsidies are available for 'clean' electricity. Gas has been the big winner of the global warming hype so far, but this period has of course ended. Soon gas too, like wind, solar and energy efficiency (and new nuclear!), may run to governments, i.e. tax payers, for support. The hope of replacing fossil fuels completely with 'clean' alternatives over a few decades is quite unrealistic in my opinion and if attempted by government diktat (however well hidden as market instruments), will lead consequences as dangerous (to society) as the worst-case scenarios from IPCC computer models.

Support for global warming mitigation comes from a coalition of research and consultancy interests (suppliers of the threat, of technical information and solutions), bureaucracy (users and beneficiaries in terms of control, competence and tasks), as well as a growing number of energy interest that are being 'bribed' and, of course, the

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<sup>5</sup> See articles and letters by Ian Castles, David Henderson and several others in *Energy & Environment* since 2004.

above mentioned devotees of the religion. The energy industries, now mainly privatised and at the mercy of ‘market forces’ are easily frightened; they tend to talk and eventually act in politically correct ways, especially if subsidies and advantageous regulations invite compliance. And the opposition? This seems to be non-existing here if ministerial statements and the PR from industry are to be believed, but may remain strong among energy intensive industries that fear that they will not be subsidised, Treasuries are becoming uneasy, are a growing number of scientists. House owners should be worried, and users of air transport with small incomes, and motorists....The poor should be very worried.

Fifth, the claim that the IPCC takes no moral or political stance – while this is the official line- is quite wrong. Anybody who has followed (and I have published) the pronouncements of leading IPCC figures, such as Sir John Houghton, Bob Watson and Dr. Pachauri, the current chair) knows that these people have repeatedly taken such stances, lend their name to all sorts of advocacy bodies. Some have made close links between global warming and the Christian religion. Indeed the churches have jumped onto this green band-wagon some time ago.

Sixth, I am not a climatologists but have after researching the IPCC for many years, I have made ‘climate sceptics’ my research area. No doubt I am too much influenced by their objections but even I have noticed that there is no clear, united front opposing the radiative forcing theory. There is no simple and politically attractive counter theory to the IPCC.<sup>6</sup> There are several counter hypotheses ranging from solar inputs to climate, other extra-terrestrial factors, to natural variability related to changes in the biosphere and/or oceanographic circulation. All lack institutional and hence financial support -- OPEC assisted then for a while but has given up. Most importantly perhaps, the opponents to Kyoto and a global regulations of emissions cannot point to single, already desired set of solutions that promise to be beneficial to the political and economic elites in developed countries – groups that will suffer but little if the price of petrol, electricity and aviation fuel rises sharply and suddenly.

Seventh, to the best of my knowledge, the link between greenhouse concentrations in the past, at all time scales, and climate is more contested than indicated by Roberts and Hacker, but to prove this would require a book. All I am very aware of is the deep distrust of many statisticians with what climate modellers, people who reconstruct past climates from proxies and who measure recent temperature changes ‘globally’, do with large sets of numbers: their quality (related to geography and measuring technology) apparently leaves much to be desired.

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<sup>6</sup> See William Kininmonth , Climate Change: A Natural Hazard, Multi-science 2004 and of course Piers Corbyn. Many scientists, including at ESA, are working on solar influences on climate. Articles by Langscheidt, Marcel Leroux, Arthur Roersch and many others have been published in E&E and are critical of the IPCC position. Perhaps most devastating in its fundamental critique is Christopher Essex and Ross McKittrick ‘Taken by Storm: The troubled science, policy and politics of Global Warming, Key Porter Books (Canada) 2003 and reviewed twice in E&E. Arthur Roersch’s book (Netherlands), Climate Change on a Water Planet, will soon be published in English. It pays attention to water vapour rather than carbon dioxide. There are many Russian challenges to the IPCC which I have published, e.g. by Kirill Kondratyev. Note that no major British climate sceptic has gone into print, though I know quite a few. Benny Peiser’s CCNet newsletter from Liverpool University is a source of useful information, Peiser, Benny [B.J.Peiser@livjm.ac.uk], as is of course the newsletter by Fred Singer (USA), see <http://www.sepp.org> .

There are a few scientists who try to assess the overall debate – the subject is simply too large. Any assessment of how much confidence we can put into IPCC ‘predictions’ (projections would be more correct, or scenarios based on ideological story-lines), remains very difficult but should perhaps be the task of institutions like yours. As far as I know, serious debates are taking place in the USA, Russia and Australia with meetings of people holding conflicting views, but this tends to be in countries with governments that while interesting in making money from emission trading and innovation - provided they are the gainers - have rejected the Kyoto Protocol.

None of the above implies that climate scientists have not made much progress in recent years, with and without IPCC linkages. The sad politicisation of climate science (internal science disputes are not new, however) springs from the use to which uncertain and still ‘open’ science - science in the research mode - is being put by interested parties. One final warning: what happened to the German forest that not so very long ago was about to be dead from acid rain? Or to the global ocean that two decades earlier, conveniently during major international negotiations over ocean jurisdiction, that was about to die from oil pollution or pollution from seabed mining? While politics may protect the environment, the environment is also a tool of politics where gaining public support is the real aim and science is (mis)used to supply authority where too little can be found.

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Contributions to the newsletter from group members are always welcome. In particular if you would like your company or research institute to feature in the

snapshot section, please draft a short description and send it by e-mail for inclusion. The deadline for contributions to the January newsletter will be the end of November 2005 and all contributions should be sent to the Group Honorary Secretary at the e-mail address above.

For further information on the Energy Management Group see our website at [www.iop.org/groups/emg](http://www.iop.org/groups/emg)