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BEDFORDSHIRE CLIMATE CHANGE FORUM

Entrepreneurship for a Zero Carbon Society

A 3-DAY CONFERENCE, 22 -24 SEPTEMBER,2008
Attended by Chair Tony Mitchell for days 1 & 2
(At the Sidgwick site of Cambridge University)
Organised by Cambridge Climate

NB the notes below are impressionistic, not verbatim. They are what I wrote down during presentations given often at considerable speed!
Web site www.cambridgeclimate.co E-mail info@cambridgeclimate.com
'Cambridge Climate Summit for full versions of some of the presentations

THE FIRST DAY started at 9-30. Despite catching the 7-30 bus from Bedford I entered the hall at 9.37. I should have got off the bus at Kettle's Yard and walked, rather than staying on it to the bus station.

Professor Robert Watson from DEFRA was speaking on the global context of the energy crisis. He raised the question of what constitutes DANGEROUS climate change and reflected on the likely effects between 1 and 5 degrees of warming, focussing on food, water, ecosystems, extreme weather and the risk of abrupt and major irreversible changes. Health impacts could be very significant, involving a change in human health, especially in developing countries. There will be considerable possibilities for conflict.

Mitigation of the worst effects can come from technology, economic and another aspect which I missed. This still leaves the question of whether we can avoid dangerous CC. **He felt that the OECD must reduce by 60-80% to allow the rest of the world to increase. A target of 450 ppm of CO2 might give us a 50% chance of remaining below a 2 degree increase in warming.**

An illustration of greenhouse gas emissions by source in 2004 showed power at 25.9% of the total and land use at 17.4%, interesting in the light of our meeting in January.

He regards carbon capture and storage as 'essential' and nuclear power as 'crucial'. He is 'dubious' about bio-fuels. He sees behaviour as 'critical', including changes in lifestyle and behaviour.

Commenting on the Climate Change Bill, he saw a major role for international financial institutions, ironically, and hopes for a good deal in Copenhagen in 2009.

A Greenpeace representative argued that nuclear and CCS were not necessary and asked about *a wartime economy to resist climate change*. He followed *the energy*

industry line of keeping everything in play! The possible effects of a financial crisis on climate change was raised. Another questioner asked at what point may we have to say that we cannot stop CC? Apparently China put in 100 Gigawatts of energy production in one year, 80 of those based on fossil fuel. India in the same period installed 4 Gigawatts.

I then pointed out that the era of cheap energy had ended, yet his model seemed to be based on no change. I referred to an illustration he had shown of the planet at night – and the amount of lighting visible from space. I asked how far he would consider **forbidding certain uses of energy and rationing some forms**. He said he would avoid that question and hope the next speaker would respond to it!

In the coffee break I talked to a Brazilian girl and a Mexican student doing a PhD at Norwich.

Dr Terry Barker from the Tyndall Centre then talked on the economics of a zero carbon society. He felt that the economic world has changed fundamentally. We need to set an appropriate price for carbon and businesses will adapt. We do not know by how much the global money stock has been reduced. Economic activity is based on trust. The Big Crunch is a global financial catastrophe based on banks creating 'bad money'. We need strong regulation for efficient economic outcomes and to help mitigate climate change. A global depression seems likely, with the US economy very weak. The gap in global effective demand could be closed by a massive effort to invest in decarbonising the real economy. 'The economics of climate change is shaped by the science' (Stern), NOT the reverse. **There is a serious possibility of CATASTROPHE – eg a sea-level rise of several metres this century**. All countries and sectors have to decarbonise – France adopting nuclear power in the 1980s is an example of accelerated decarbonisation. Copenhagen reduced emissions by 20% since the 1990s (?). Not enough studies on stringent mitigation have been done.

Conclusions he drew from this included :

- *G8 target of 450 ppm is not stringent enough to avoid dangerous climate change*
- A real carbon price will support zero carbon
- Costs critically depend on international co-operation

Next up was Professor David Mackay, on Sustainable Energy Without the Hot Air. He believes that a 10 fold reduction in Co2 by 2100 is necessary. Could Britain live on its own renewables? **CSP is the most promising possibility**. We cannot live as we currently do solely on renewables. What options have we got?

Reduce the population? Change lifestyles? Technology? Nuclear? Coal? Other people's renewables?

CSP will work but will need a solar farm the size of Wales. He would advocate 33% CSP, 33% Nuclear and 33% renewables.

In response to hostile questioning he declared that he does not necessarily advocate nuclear. **If we can reduce demand by 50%, we can manage without nuclear**. Therefore he was able to agree with the (Greenpeace) questioner that we do not need nuclear. He had no faith in CCS. I wondered (but did not ask) if enough consideration was being taken of the technological developments outlined in the Guardian IT section dated 18/9/08.

Over lunch I chatted with Professor Doctor Fritz-Dieter Doenitz, speaker from Germany after lunch on CSP

After lunch Filipe Santos gave an overview of alternative technology which was largely on the market for solar power and not very helpful. He was followed by Leo Johnson on the role of business in responding to climate change risks and opportunities. He was amusing but provided little of substance.

At 15.15 Dr Fabien Roques talked on Nuclear Power – What Else?
Between 1955 and 2006 16% of the world's electricity was provided by 435 nuclear reactors. Nuclear's heyday was 1970 – 90.

Any renaissance faces major hurdles, such as human resources and public acceptance of waste and proliferation. He did not feel that fuel supply/uranium reserves would be one of them. He made no mention of accidents, the costs of uranium and decommissioning nor the deflection of investment from renewables. He felt that the two biggest threats were proliferation and terrorism.

I DECIDED NOT TO STAY FOR THE PANEL DISCUSSION NOR THE BANQUET – A GREAT PERSONAL SACRIFICE.

THE SECOND DAY started at 9 am with Mr Roman Webber and Professor Paul Ekins talking on Policies for an Environmentally Sustainable Economy.
RW noted that fossil-fuel generated electricity is currently cheaper than renewable, and gave an outline of incentive mechanisms for promoting Co2 abatement, including The Energy Saving Trust, Warm Front, SD relief on zero carbon homes in the residential sector. But UK emissions are static at the moment.

PE was very good. He argued for ACTION, with Green taxes and Environmental tax reforms. We MUST keep well below the 4 degree increase in warming level! Private industry will not invest in renewables if there are not big profits to be made. We have 8 years before we exceed 2 degrees increase in warming. We can do it but it will need a HUGE effort. **The projected UK emissions' targets in the CC bill are well short of what is needed**.

CARBON RATIONING IS WHAT IS NEEDED. This is the reality. Patio heaters, plasma tvs, SUVs, indoor ski slopes, outdoor skating rinks, standby and so on must be regulated. But taxes and rationing will be very unpopular. People must be made

- aware of prices
- aware of how much they consume (meters)
- aware of alternatives

It is happening, but much too slowly, because of death by consultation

1 Carbon taxes and fuel poverty – the lowest income folk (80th percentile) *consume 6x more energy* than the 20th percentile. Local authorities should be majoring on insulating existing housing stock, especially in disadvantaged areas.

2 Equitable carbon tax. Green taxes on resource use …. They do work, to choke off investment in high carbon technology – eg runways will greatly change lifestyles and create huge profits. A Green Fiscal Commission was launched in November 2007 to look into this. There is *a huge responsibility on the Media and Political parties so that we can have a grown-up debate about what we need to do.*

At 9-45 Dr Bernie Bulkin and Professor Michael Mainelli took the stage to talk on venture capital, risk and the business of climate change.

BB was first and was very good. He posed the question about Energy Venture Capital – is it Get Rich Quick or Save the Planet? De-salination is the biggest opportunity on the planet. Other investment in Green technology is steadily increasing. Of Clean Technology portfolios, the category leaders in key sections are:

- Solar – especially CSP in the desert
- Power Storage and Management (inc from wind)
- Personal Energy use – electric vehicles.
- Energy from Waste (as proposed in Bedfordshire).

Professor Mainelli then took over, telling us about the London Account, making investment work for the climate. 86% of capital investment is from the private sector. There are several publications on investment opportunities and he mentioned specifically "Climate Change; the State of the Debate" by Alex Evans, published by RiverPath Associates – context, analysis and commentary. As on day one, the importance of Land Use and Climate Change emerged – he saw it as contributing 18%.

HE DID NOT THINK THAT NUCLEAR POWER IS A PARTICULARLY INVESTIBLE PROPOSITION.

At 11 am Professor Ann Dowling took over on Energy Efficient Cities – an Integrated Approach to Achieving Low Carbon.
Buildings demand 40% of energy, ground transportation 27%. 40+ years in energy savings to match new-build emissions.

Production. Maintenance. Use. Disposal – 4 elements producing emissions. **Cars major on use!**
"Energy Efficient Cities" is a new interdisciplinary collaboration with £2.9 million from the Engineering and Physical Sciences Research Council.
A centralised power station using gas combined cycle is 45-55% efficient; using coal the figure is 35%. Intensive research is being done on the next generation of pv, including polymer. Vertical axes wind turbines work well in gusty conditions which the more conventional models dislike.

Clare Shuttleworth picked up the baton on Zero Carbon Cities – a Perspective. Land degradation ranks with CC and loss of biodiversity as a threat to habitat, economy and society. The target of zero carbon housing by 2016 begs the question about what zc means. Does it include travel, work/domestic and food/resources use? Are we doing the right things in the right way? *There is little central direction of standards in the UK.* The answer re what zc means lies in behavioural change, governance (feasible in a democracy?) and technology.

In the discussion which followed I mentioned the difficulty I had had in trying to discover the eco credentials of a wood-burning stove, or where eco-houses were being built for sale. A Government organisation, Warm Front, when asked about approved installers, had referred me to their web-site. This suggested that the information was distributed in regions, but whichever region you clicked on the same list of about a dozen installers from all over the country came up. When I rang them back to suggest that this was not helpful they said it was all they had! *It was agreed that a rationalisation of information to help those who want to change is very necessary.*

CS went on to ask what's happening? Where are we? The energy agenda seen as a risk, in such things as wind turbines and planning. What role are renewables expected to play in our energy requirements – 10%? 15%? 20%? How does this fit with the UK Renewables Strategy? A low carbon approach for new build lacked steer from local authorities and a regional energy strategy. The criteria for assessing the sustainability of a house should include energy (34%), water, waste etc., not just carbon. The energy expended in creating, say, an eco-house, takes 40 years to pay it back and start new saving!

I commented that an unquestioned assumption that seemed to run through all the contributions so far had been that **the resistance of the population to initiatives for change was too strong to be challenged.** I suggested 3 things:

- This assumption needs testing, especially with regard to vocal minorities
- More effort needs to be put into persuasion
- Ultimately, leadership needs to be exercised, no matter how little politicians like it, with some elements of compulsion, rationing, etc.

If not, are we saying that we can just let it all go wrong?

At 11-45 we had a panel (of the speakers so far, chaired by Nick Butler, chair, Centre for Energy Studies at Cambridge) discussion based on audience questions.

They were asked for the most important step to take now. The replies were:
How do we make expensive things cheaper?
Controlling the allocation of carbon by permits
Clear, comprehensive standards
Nudging the system across the range. There is no magic bullet.
Government mandating power allocations and inviting businesses to tender to provide it.

Last year 114 new coal-powered stations were opened in China. The Chinese could become world leaders in CCS because no one else has developed it.

THE GOVERNMENT IS AFRAID OF HIGH LEVEL DEBATE ON NUCLEAR POWER.

B Bulkin, again, pins *great hopes on electric cars*, which he said had been held back in development by more conventional forces in the industry.

At 1345 Mr Angus Norman of the French EDF company talked on Delivering sustainable Energy Solutions; an Energy Company View. He was a very poor speaker but the overall message was very clear – "**the future will be nuclear, it will be renewables, it will be coal … we must keep all energy forms in production"** (and making profits for those who sell them).

At this point I set myself a little sum. If your car emissions are 109 per Km, how much do you save over a year compared with a car with emissions of, say, 240? I haven't worked it out for my mileage. *What would it be for yours??????*

At 1415 Professor Fritz-Dieter Doenitz, Dr Joachim Reiss and Dr Harry Zervos talked about the large scale development of solar energy, working with policy and investment.

F-DD took us through **Concentrated Solar Power**, using Parabolic Trough Collectors and showed how **the Germans are already operating it successfully in Spain**.

HZ told us about thin film solar technology developments, indicating that the lack of raw silicon means that current pv is unsustainable.

JR considered some of the problems inherent in solar equipment and progress in dealing with them. He felt that modified pv can still become a major source of the European Electricity supply.

At 1535 we moved into another panel discussion with those who had spoken since the last one, chaired by Professor Peter Guthrie. F-DD was asked about <u>security of supply for electricity from CSP located in the Sahara.</u> Unfortunately, I don't think he understood the question, because his answer was irrelevant. Someone else said that it would be no different from now, where our reliance on foreign gas and oil is equally susceptible to terrorist attack.

The last session for the day was provided by David Lyon, speaking on process and business model innovation to deliver a low-carbon economy. Perhaps I was suffering from talk fatigue by then, but I noted nothing of interest. Among the documents I brought back are several by Arthur D Little, DL's employer.

On Day 3 I would have heard

D Mclaren (FoE) and G Starks (AMEE) - Behaviour Change & the Role of NGOs.
Prof D Mackay - Education of Climate Change at Cambridge and Beyond
R Bell - What Government Can Do to Stimulate Innovation for a Zero Carbon Society
R Lovegrove – The Possibilities – Changing How We Approach Design
R Blundell – The Future of Electric Vehicles & Fuel Cells
D Mcleish – What to Do With the CO2 We Cannot Eliminate?

Tony Mitchell 10/10/08