

Stern Review, 2nd Floor, Room 35/36, HM Treasury, 1 Horse Guards Road, London SW1A 2HQ, Email: callforevidence@sternreview.org.uk.

22 November 2005.

Dear Stern Review Team,

In this submission, I describe two things that relate to climate change, that are not widely known or widely discussed, and that seem to me to provide some useful clarity amongst the complexities and uncertainties of the issues raised by your terms of reference.

1 CONCENTRATING SOLAR POWER

Enormous quantities of energy fall as sunlight on the world's hot deserts and 'concentrating solar power' is a proven technology for tapping in to this vast flow of energy (see, for example, www.eere.energy.gov/solar/csp.html). In one of the simplest of several variations, mirrors focus sunlight on to a tank of water at the top of a tower. This raises steam that can be used to generate electricity in the conventional way. Any solar power plant of that kind may, of course, be replicated many times.

Many of the world's hot deserts are in countries that are relatively poor so we may suppose that concentrating solar power could be a particularly welcome new source of income (via taxes or rental from the solar power companies). More generally, concentrating solar power has the potential to become a large new industry in the world with many benefits in terms of jobs and earnings and without the worries associated with other sources of energy (more below).

The heat from concentrating solar power plants can be stored in melted salt or other substance so that, when the sun goes down, the power plant can continue to generate electricity right through the night.

Electricity from concentrating solar power plants may be transmitted directly to where it is needed but conduction losses put a practical limit on distances. However, solar electricity can be used to generate hydrogen by the electrolysis of water and then hydrogen can be transported by tanker or pipeline to where it is needed.

An interesting possibility is to transport solar energy, or store it, as finely powdered metal (iron, aluminium etc) or boron (see the attached article from the New Scientist and my recent letter in the New Scientist). Instead of 'the hydrogen economy' we should, perhaps, be aiming for 'the powdered boron economy'!

Another interesting possibility is to take advantage of the fact that the land under the mirrors of a solar plant is protected from the harshness of direct tropical sunlight but should receive the right amount of indirect light for growing plants – a potential horticultural bonus. An obvious problem is that plants need water and that is not plentiful in hot deserts. But sea water can be desalinated using sunlight and this may provide the fresh water that is needed.

Iran claims that it needs nuclear technology as a source of electrical power but Europe and the USA are suspicious that the technology could also support the building of nuclear weapons. However, Iran has a rich source of energy in the sunlight falling on its deserts. Europe and the USA could call the bluff of the Iranians by offering to build enough concentrating solar power plants in the Iranian desert to supply all of the country's needs (perhaps with wind power to make up any shortfall during the Iranian winter). Even if the bluff were accepted, it would be a cheap way to buy peace of mind about Iran's possible development of nuclear weapons.

More generally, concentrating solar power provides the means of avoiding the many disadvantages of nuclear power (high cost, vulnerability to terrorist attack, facilitating the proliferation of nuclear weapons, the production of waste that is dangerous for thousands of years, and the release of significant amounts of CO₂ in the mining, transportation and processing of uranium).

With economies of scale, concentrating power is likely to be very competitive on cost.

Hot deserts and other areas with high levels of direct sunlight are very widely distributed in the world - which means that no country need be overly-dependent on a few sources and there should be fewer worries about security of supply compared with current concerns about oil, gas or (to a lesser extent) coal.

2 REDUCING DOMESTIC EMISSIONS OF CO₂

Since 2001, my wife and I have been examining the problems and possibilities in reducing those CO₂ emissions over which we have direct control. We have been recording what we have learned on our website (www.mng.org.uk/green_house) and we have compiled a spreadsheet to show what savings we have managed to make and where (www.mng.org.uk/green_house/carbon_calculations/co2_emissions_and_savings.htm).

Our overall conclusion is that, with relatively little cost and little or no change in the comfort or convenience of our lives, we have managed to reduce our CO₂ emissions by 50%, not far short of the Government's 60% target for 2050. If the same is true of industry, commerce and administration - and we suspect it is - then there should be no difficulty in hitting the Government's 60% target for 2050 and doing it very much sooner than that date.

Air travel can make a big difference to the calculations so it is useful to see what can be achieved for all sources of CO2 apart from air travel. For that part of our CO2 emissions, our savings are also close to 50%. By making similar cuts in air travel - travelling abroad once a year instead of twice - gives us overall savings of 50%. If we were to cut out air travel altogether - which is not a great hardship for 'recreational' travel and which increasing numbers of people are now doing - our overall savings in CO2 emissions would now be more than 75%.

3 CONCLUSION

I hope the two things that I have described here will help to illuminate some of the issues you will be considering.

The huge potential of concentrating solar power is not widely understood and it can have a dramatic and positive impact on how the world weans itself from its current dependence on fossil fuels.

Our experience in cutting our domestic emissions of CO2 shows that large cuts can be made without large expense and with little or no impact on our comfort and convenience. We believe the same is probably true for industry and commerce.

Sincerely,

Gerry Wolff

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INTERNATIONAL DAY OF CLIMATE PROTEST and, in London, CLIMATE MARCH: Saturday December 3rd 2005