

Clearing Away Carbon

PETER READ outlines a holistic strategy to use biofuels and carbon storage to return carbon dioxide in the atmosphere to pre-industrial levels

There is widespread concern that the world's climate is already witnessing precursors of abrupt (and immensely damaging) climate change, such as that possibly caused by continuing slowing of the Gulf Stream, which keeps Europe warm in winter. The thresholds for such changes are poorly understood and it may be that the only way to prevent dangerous climate change — the objective of the UN Framework Convention on Climate Change (UNFCCC) — is an early return to the pre-industrial levels of carbon dioxide in the atmosphere. That is inconceivable under the the Kyoto Protocol process, but it seems that it could be achieved by 2040 under a different, holistic approach.

The Protocol's theoretical basis assumes that emissions from human activities are the sole source of greenhouse gases. In fact the natural flux of emissions and absorption by the terrestrial biosphere is about twenty times as great. It is much easier to increase biotic fixation of carbon by investing in under-capitalised (and often over-exploited) land than it is to reduce emissions from the capital-intensive energy sector.

Polluter pays

The vision of this holistic greenhouse gas strategy is that the 'polluter pays' principle can be turned to a greening of the earth, to the advantage of developing countries with potentially productive soils. The strategy is the outcome of an expert workshop in Paris in 2004, funded by the Better World Fund on the policy implications of potential abrupt climate change (www.acstrategy.org). It concluded that "policy makers should be urged to create a global bio-energy industry with world trade in bio-fuels such as ethanol and bio-diesel" as the first part of a two-stage strategy to address potential abrupt climate change.

The second stage, to be implemented if such abrupt change became imminent, would achieve effective control of greenhouse gas levels on the timescale of a decade or so — rather than over centuries, as under the Kyoto Protocol. This control could be secured by linking the production of bio-energy to carbon storage. Growing biomass for energy would take up the gas from the atmosphere and, when the resulting bio-fuel was burned, some of the carbon dioxide would be prevented from getting back into it — through, for example,



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capture and sequestration technology at biomass-fuelled power stations and bio-refineries.

Science-based

The strategy is not based on any specific technology, as bio-energy systems are as varied as fossil fuels, and as there are also many ways of storing carbon out of the atmosphere. But it is science-based in the sense that it addresses the real problem of potential abrupt climate change by actively removing carbon dioxide from the atmosphere, unlike the broad band of zero-emission technologies promoted by the Kyoto Protocol that simply avoid emitting it. Done on a sufficiently large scale — and with care for environmental impacts — it could quickly get control of carbon dioxide.

The first stage offers benefits, rather than costs, to a great many interests. The only losers are the owners of land containing unconventional fossil fuels, like oil shales and tar sands, who would profit if energy companies exploited them.

For the energy sector such a transition to biomass raw material is no different from previous transitions from wood fuel to coal to oil to natural gas. It is far more easily assimilated than a shift to intermittent sources of non-fuel energy: 'defossilisation' is greatly preferable to decarbonisation.

There are many environmental benefits. Firstly, large ►

scale bio-energy makes far more ambitious reductions in net emissions of carbon dioxide possible than can be envisaged from the measures for capping emissions and trading carbon allowances under Kyoto, which are designed simply to reduce energy sector emissions. Secondly, a credible and rising obligation to use biomass raw materials will progressively redirect energy investment towards them and away from expensive unconventional fossil fuels. And thirdly, large-scale investment in biomass supply brings with it the possibility of rectifying traditional neglect of the land and offers the prospect of cash flows that secure biodiversity, and enable reforestation, soil improvement, anti-desertification and other environmental and social measures.

Energy security

There is no lack of land. Much biomass could come from focussing the existing management of forests and farms towards co-producing energy along with food and fibre. But Food and Agriculture Organisation studies show that there are around 2.38 billion hectares of unused potential arable land, much of it in the South, and especially in sub-Saharan Africa and Latin America. The shortage is not of land but of investment in land.

Large scale bio-energy production, traded internationally — mainly from developing countries to industrialised ones — offers advantages to most nations. It promises to give major oil-importing countries increasing energy security. It would provide alternative sources of income to Northern farmers that are compatible with WTO rules, and reduced burdens of farm support to their taxpayers. And cultivating biofuels offers many land-rich but cash-poor developing countries both a means of sustainable rural development and prospects of export-led growth based on trading them.

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The new approach — involving a commitment to sustainable best practice in improving land use — could be pioneered by a ‘coalition of the winning’ involving a group of initiators (say the G8 countries, the rest of the EU, China, India, Brazil, South Africa, Nigeria, Indonesia) which would progressively expand as others saw the advantage of participation. Such a coalition could commit to using a rising proportion of liquid bio-fuels for transport, mixing a rising proportion of woodchips or other biomass into fuel for power stations, and to supporting an increasing area of forest plantations to act as a strategic reserve of material, thereby making an early start on the removal of carbon from the atmosphere, needed for effective control of greenhouse gas levels.

Eventually, as Parties to the UNFCCC came to appreciate the merits of this science-based approach, it could become embodied in a second protocol, focused on potential abrupt climate change, which would be complementary to Kyoto and reinforce its effectiveness.

The negotiating community has inexplicably so far failed to notice the win-win-win possibilities of treating the carbon cycle as a whole in this way, rather than focusing on the very small fraction emitted by fossil fuel users. Let us hope that the vision behind this holistic strategy can inform future climate negotiations and set them in a more hopeful direction n

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