

Talk for U3A in Haddington

GLOBAL WARNING

Wed 16th November 2005

Modified from
Talk at Morningside Peace & Justice Centre
Ulrich 23rd February 2005

We now live in a uniquely dramatic time, when one species, us, has caused global change. And this (the last 200 yrs and the next 100) is the brief era of human use of fossil fuels, coal, oil and gas. Use has risen from near nothing to billions of tons per year, and it must fall again, either as the source runs dry or as pollution prevents its use. And for the first time, the impacts of humans is global not only local or continental. Hence my title: Warning as a pun on the current debate about Warming.

- Title

Look at Earth from space; only a scientist could tell you for certain that there is life there.

- $\frac{3}{4}$ Earth; should better be called Water.
- Closer view, green growth but no sign of humans
- Night view, shows intelligent activity of artificial lights throwing their energy into space – unintelligent actually!
- Sumerian civilization, now Iraq, the green become desert. Global warnings, and indeed potential warming, started at the beginning of Western and other civilization.

.Ask what are the effects of all these human impacts.

Earth as a large self-balancing eco-system. Gaia theory. The balance of things on Earth is in an unstable state, lots of oxygen and lots of things ready to burn up. Yet the amount of oxygen, of carbon dioxide, nitrogen, all atmospheric gases, has remained much the same for millions of years and burnable matter like all of life is still there. How can this be maintained? The answer is that life itself has maintained conditions on Earth suitable for life. That is the essence of Gaia Theory. We must see global warming caused by increasing various gases in the atmosphere, as the first time in history, history not just of humans but history of the

Earth, that this single species has disturbed an equilibrium otherwise maintained by all species.

As a result, we face not just technical problems about how to cope, but new moral and social dilemmas. We are challenged as never before to live in a way that does not destroy – that is a wholly new way, previously achieved only by a few isolated peoples, - that must now must be global.

‘Global warming’ is a possible result not a cause, of other actions. It is the result of putting into the atmosphere a number of gases, CO₂, methane, NO_x, CFC’s, and others, beyond the amounts that nature has historically dealt with.

Arrhenius predicted global warming in 1896, and others suggested the possibility before him. He got his numbers about right, 2 degrees up if we go on as we did, and we have!.

Still doubts and uncertainties – many discussion on the media. BUT, CO₂ is a physically and biologically active gas – increasing its concentration in the atmosphere must have a variety of results. Warming is only one possible; increased photosynthesis another, different gas regimes for respiration another; changed growth patterns in virgin tropical forests another. Easiest for now just to look at evidence on the ground:

- North Pole ice cap
- San Raphael glacier
- San Raphael retreating
- IPCC report

Look at amounts:

Table 1: Carbon pools



Above-ground carbon pools (billion tons)

Atmosphere	720-760
Living land biomass	600-1,000
Dead land biomass	1,200
Fresh water	1-2
Oceans	38,400-40,000

Below-ground carbon pools

Fossil fuels	>4,130
coal	3,510
oil	230
gas	140
other	250
Rock	>75,000,000

Total emissions caused by humans

Fossil fuels	6
De-forestation	2

- Diag of global carbon stocks and flows.

After losses of CO₂ from tropical deforestation are taken into account, temperate, boreal and tropical zones all reveal themselves as carbon sinks. According to one synthesis report, the temperate and boreal regions constitute a sink of $1.3 \pm 0.9 \text{ Gt C year}^{-1}$ whilst the tropical sink is $1.9 \pm 1.3 \text{ Gt C year}^{-1}$ (Royal Society 2001)

About $\frac{1}{2}$ the gases emitted are absorbed, largely by the oceans, and some by land.

Brief look at methane: many times more absorbing of heat than CO₂; produced by anaerobic decay in mud and rice paddies, cattle and termites, land-fill sites. Two benefits of using the waste as energy source: rid of the gas and produce energy. Land-fill gas now recognized as renewable source (which it is not). Huge amounts stored in permafrost and in deep oceans. If warming goes too far, this can be released, create more warming, and lead to run-away heating.

Many things influence the world's climate and local weather; intrinsically not predictable, but data can be modelled in which every known effect is incorporated into a computer simulation.

IPCC reports regularly and as the years roll on, conviction is strengthening. Yet there are fashions in science – we will not have proof until too late. Clear case of limited respite time given urgency of response time.

Action needed at every level of life. Housing, transport, industry and land use are each roughly ¼ of total CO₂ outputs.

But we are dealing with the global commons. The only way to get action is to co-operate. Hence after a decade of arguing, created the Kyoto Protocol in 1997, finally signed in Feb 2005, with Russia becoming crucial member. USA not ratified, but many States and industries are taking action.

UNFCCC will hold press conference tomorrow on progress.

This obliges all participating countries (that includes USA) to agree action to limit CO₂ emissions. 38 countries (Annex 1) are given the tasks of reducing by some 5% below 1990 levels. Others, like most developing nations, are not part of this.

- C & C

The allocations are designed such that trading between them is possible, and is intended to allow continued economic development with reductions in carbon emission.

Any country that has more than achieved its 5% or whatever, reduction, can sell the credit to those in need.

Two Types of Trading in Carbon

1. Under the Kyoto Protocol, the EUETS, the UKETS, and various private sector schemes, attempts are currently being made to commodify, and trade in, two different kinds of carbon dump. One is the world's existing carbon-absorbing capacity in air, oceans, vegetation, soil, surface rock and so on. The other consists of speculative "new" carbon dumps to be opened up above ground or in the future. The first kind of carbon dump is real. The second kind of dump is largely fictitious, as is the commodity that would be made from it.

The existing absorptive capacity is not wholly understood and does not need to be. Allocations are made on emissions; where they go is the commons.

Trading existing dumps

1. Under the first part, the United Nations would distribute billions of dollars' worth of rights to (over)use existing carbon dumps to 38 industrialized nations who already use them the most, permitting them to sell portions of what they do not use. The Protocol is intended to bind these countries to reducing their emissions by an average of about five per cent below 1990 levels by 2008-2012 (that is, to use only around 95 per cent of the dump space they had used in 1990), although due to various loopholes these reductions will not be achieved even if the Protocol is implemented as planned.

2. New carbon sequestering projects are made under the "Clean Development Mechanism". Example: land fill gas is a new development. In the EU however, there is already regulation that land-fill may not emit methane, it must by law be burnt. This is not therefore a new clean development. Argentina, Brazil and Mexico which also had or planned such laws, have however now removed this legislation. Their land fill developments therefore come potentially under the CDM and will be granted credits which they can sell. These become "Certified Emission Reductions".

However there are none yet. Instead, the WB and Dutch Gov et al, have less formal interim “Verified Emission Reductions.” So far there is only one, that is Adrian’s in Mexico!

This system of carbon trading is in essence, setting up a carbon standard like the gold standard. We may note that carbon actually has value. It is also like a rationing scheme in which it is legal, indeed encouraged, to trade in the ration coupons.

For existing emission allowances, Europe allocates its share to each country.

In the UK, assets in carbon dumps currently worth up to €3.7 billion yearly are to be handed out beginning in 2005 under the European Union Emissions Trading Scheme (EUETS) free of charge to approximately 1,000 industrial installations responsible for around 46 per cent of UK emissions (Table 2). On a rough reckoning, these rights entitle UK industry alone to transferrable, monetizable access to approximately five per cent of available world carbon dumps.

- Allocations to UK by Europe

What is being created in effect, is a carbon standard, like one used to have a gold standard.

Now, what can we actually do to reduce carbon dioxide emissions or to increase sequestration – the taking up of carbon out of the atmosphere?

Planting trees is an obvious one – re-creating much of the world’s forests will over time reabsorb the carbon that has been emitted. It is difficult to judge or calculate what any country can claim as forest sequestration, for both technical and assessment reasons. We have and want forests anyway – to what extent when you plant a forest, can you say this is for the purpose of carbon sequestration? FF were described in the Observer last July, in a program to offset your years driving or flight across the Atlantic by planting two trees. You pay £10 or £15 per tree, a couple will do. They actually plant more to make sure. But you can see that two tiny seedlings are not going to absorb the tonne of carbon your car emitted in a year!

Housing, transport and industry account for roughly a third each, plus another third if you include land use in Scotland.

Housing – could easily be built to use 0 – 20% of current fuels. Why don't we? Spend just a bit more and never pay any large fuel bill again, forever!

There has to be a change of lifestyle, and the change may be painful but the result could even be an improvement.

- BedZed
- BedZed
- Berwick
- Slateford

Our own air solar panels. It is a crime against humanity to ever build a roof that is not solar, passive or active. Greens called for minaturised power plants on every home, in The Scotsman yesterday.

- Ormiston

The other big issue of course is wind-power. All the rage, and commercially viable. But a real problem _ because wind fluctuates so much, back-up power is needed. The power stations that can switch on fast, are less efficient. Windpower might actually increase CO2 emissions! The fluctuations due to demand are already bad enough.

- Hippos.

Table 2: Privatization of Global Carbon Dumps by the UK

Draft National Allocation under the EU Emissions Trading Scheme

Industrial sector (UK only)	Annual gift of emissions rights (mtCO ₂)	Percentage of available world above-ground carbon dump*	Proj. annual value 2005-7†
Power generators	143.7	2.9%	€718m - 2.155b
Iron & steel	21.2	0.3%	€106-318m
Refineries	19.1	0.4%	€95-286m
Offshore oil & gas	19.1	0.4%	€95-286m
Chemicals	11.1	0.2%	€55-166m
Cement	10.1	0.2%	€50-151m
Pulp & paper	4.3	0.1%	€21-64m
Food & drink	3.9	0.1%	€19-58m
Other industries	12.9	0.3%	€64-193m
TOTAL	245.4	5.0%	€1.227 - 3.681b‡

* Based on the assumption that anthropogenic CO₂ emissions from fossil fuel combustion and flaring must be reduced by 80% from current levels of 24,533 million metric tonnes/year to achieve eventual stabilization of CO₂ levels.

† Based on the assumption of a "market price" for EU emissions allowances of between €5-15/tCO₂ (see Environmental Finance, April 2004).

‡ Columns may not add up due to rounding.

Source: EU Emissions Trading Scheme, UK National Allocation Plan 2005-2007, DEFRA, London, 2004.

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1. Several points are worth making about this statistic.
 - a. UK population amounts to less than one per cent of the world total, not five per cent.

- b. The dump space being distributed by the UK government does not fall, geographically or otherwise, under UK legal jurisdiction, but is a capacity inherently spread around the world.
 - c. No allocations are being made to individuals or cooperative groups, but only to corporate bodies.
 - d. Under Kyoto, no entitlements are as yet to be given to Southern countries, but also no restrictions placed on Southern dump use.
 - e. While the aggregate amount of property rights in the world's carbon dump being distributed to industry is to be progressively reduced in the future, the pace and magnitude of this reduction is unclear, while the benefits industry gains from its initial holdings will be lasting.
2. Such schemes, in awarding the largest historical users of carbon dumps the most formal future rights in them, constitute, ultimately, one of the largest, if not the largest, projects for creation and regressive distribution of property rights in human history, bearing comparison with the enclosure movement in Europe and elsewhere.
1. The principal conclusions of this Memorandum are as follows:
- o International emissions trading systems (ETS) as currently conceived are not feasible.
 - o In particular, *mixed trading systems* which treat as exchangeable (a) credits allowing the emission of carbon dioxide from fossil fuel combustion and (b) credits for carbon sequestration, "avoided emissions", "emissions reductions" or baseline-and-credit projects generally, are not verifiably climatically effective or relevant and hence are a waste of time.
 - o *All* trading systems that involve the allocation by the state of large quantities of free emissions rights to business are prone to a fundamental contradiction, which, again, tends to render such systems climatically ineffective. They are also unlikely to be politically sustainable due both to their blatantly inegalitarian allocation of property rights and additional inegalitarian structural tendencies.
 - o *Mixed trading systems* involve an additional regressive global redistribution of land, water, air, forests and other goods which also renders them politically and environmentally unsustainable.
 - o *Contraction and Convergence*, which involves a nominal or theoretical egalitarian pre-distribution of private property rights in the earth's carbon-cycling capacity, overcomes some of the political difficulties associated with trading systems that rely on "grandfathering" of rights. In particular, in the long term, it is likely to have more appeal to both South and North than many of its competitors in international negotiations. Unlike other trading systems, such as those associated with the Kyoto Protocol and the EUETS, it also reflects in its structure the need for effective climate action over realistic time periods.
 - o Insofar as Contraction and Convergence allows *mixed* trading systems, however, it would be climatically ineffective and prone to set off conflicts over land, water, air and other goods in local areas. Insofar as it appends

- itself to current regimes of commodity trade and national sovereignty, moreover, problems of inequity in practice need to be considered.
- Numerous more effective, more efficient, and more egalitarian alternatives exist both to emissions trading systems and to the particular types of emissions trading system currently enjoying a vogue. These include regulation, taxation, support for existing low-fossil-carbon economies, and various alternative schemes of creating and distributing property in the earth's carbon-cycling capacity that do not involve commerce and do not presuppose that the private sector already owns the world's carbon-cycling capacity.
 - For these alternatives to be properly researched, explored and supported, and for the challenge of evolving new property regimes governing the earth's carbon-cycling capacity in a way which respects equality, political realism and the necessity of swift action to slow the transfer of fossil carbon to the surface, it is necessary for government to promote a public debate on the issue, halt the rush into ETS, and redirect research and development funds toward more realistic, non-market-based schemes.
 - Even more important, the government must halt subsidies for continued exploration, extraction, exploitation and burning of fossil fuels, instead supporting and fostering communities' and local authorities' own attempts, many of them of long standing, to follow low-carbon ways of life; institute deeper cuts in carbon use; respect regional decisions to exclude mining or refining of fossil fuels, power production, and so forth; and support energy efficiency, renewables, non-fossil-fuelled technologies and responsible tree-planting without trading them for continued fossil fuel extraction
 - Internationally, the UK can exercise leadership both in the G8 and the EU on all these scores. One simple, easy, concrete and relatively painless first step would be for the UK immediately to set out a policy of abjuring reliance on carbon credits of type (b) (*see above*) and on all mixed trading schemes.
 - Joined-up policy by different government departments is needed, but joined up in the service of a different objective than at present. Currently, the policy of different government departments is joined up, to a greater or lesser degree, around the objective of maximizing the flow of fossil carbon from underground to above-ground biophysical systems, whether through subsidies for fossil fuels or, indirectly, through emissions trading. Government policy must be turned around so that the work of different departments is joined up around a different objective. The ending of subsidies for fossil fuel extraction and exploitation must go hand in hand with an abandonment of emissions trading, particularly mixed trading systems, and with new support for energy efficiency, renewables, and existing community-based sustainable energy systems.

"the Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil."

Contraction and convergence

104 *D.J. Wuebbles, A.K. Jain / Fuel Processing Technology 71 (2001) 99–119*

Fig. 2. Observed monthly average CO₂ concentration (ppmv) from Mauna Loa, Hawaii [12]. Seasonal variations are primarily due to the uptake and production of CO₂ by the terrestrial biosphere.

104

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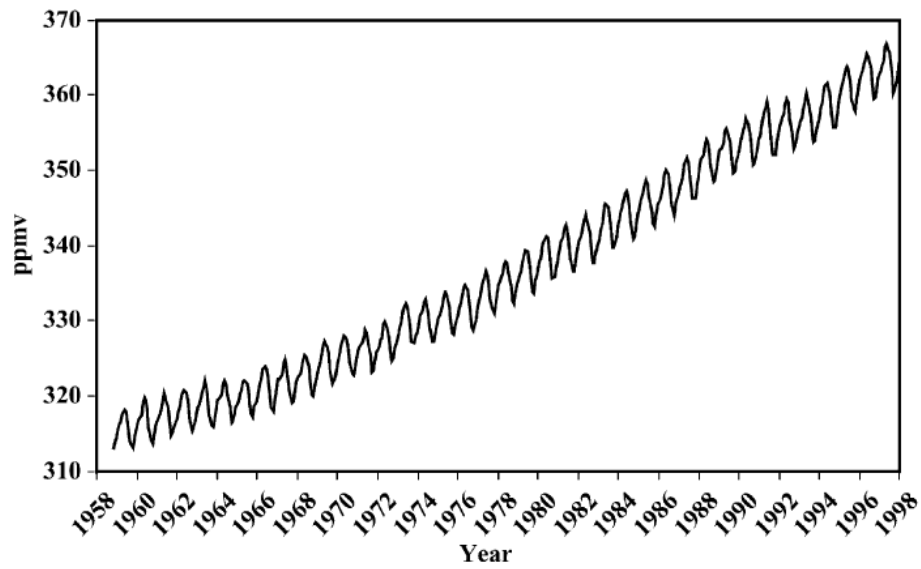


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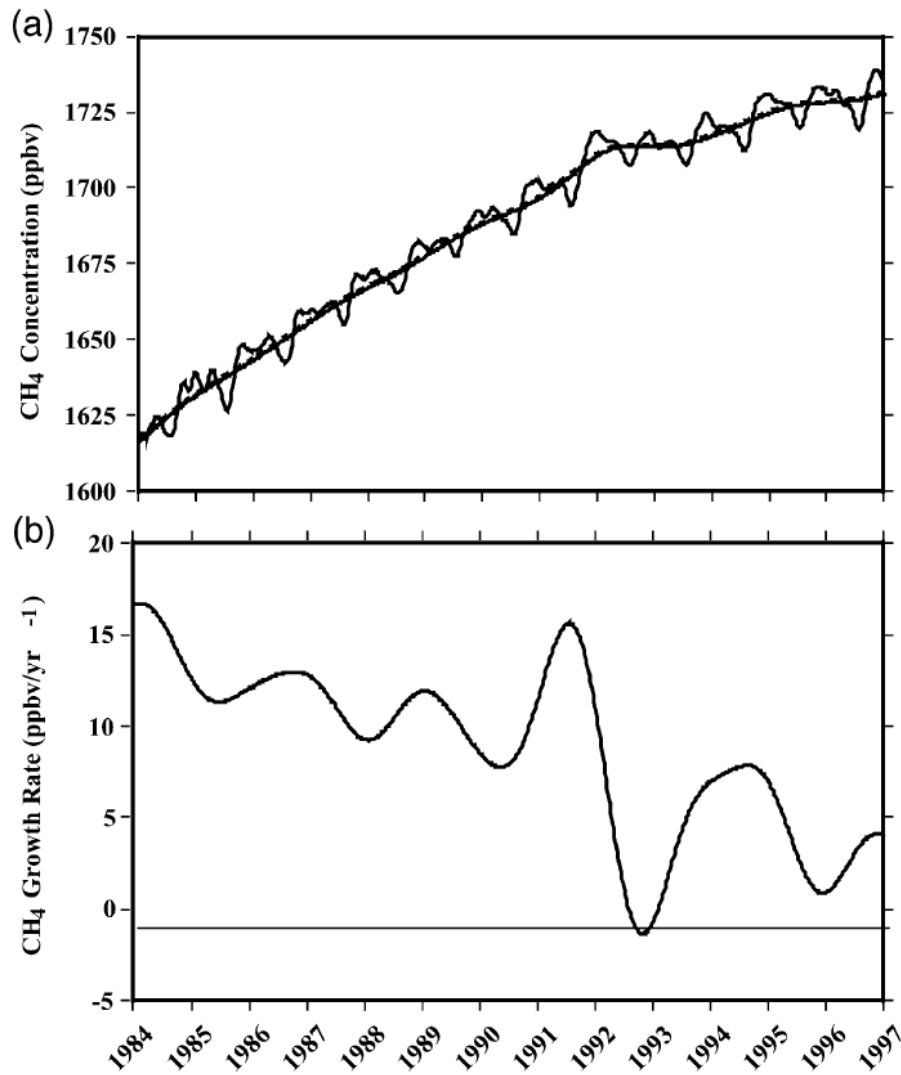


Fig. 3. (a) Globally averaged atmospheric CH₄ concentrations (ppbv) derived from NOAA Climate Monitoring Diagnostic Laboratory air sampling sites [14]. The solid line is a deseasonalized trend curve fitted to the data. The dashed-line is a model (that accounts for CH₄ emissions and loss in the atmosphere) estimated calculated trend that fit to the globally average values. (b) Atmospheric CH₄ instantaneous growth rate (ppbv/year) which is the derivative with respect to the trend curve shown in above panel.