PUTTING COSTS INTO PERSPECTIVE - ECONOMIC BENEFITS FROM FIGHTING CLIMATE CHANGE

BENEFITS	OR	COSTS?
"...there are many potential policies to reduce greenhouse-gas emissions for which the total benefits outweigh the total costs"		***"The projected costs to the economy and to individual businesses that would result from carbon emission reduction proposals...will be unacceptably high".***
(Economists' statement on climate change [2000 economists including six Nobel Laureates], February 1997)		US National Association of Manufacturers (NAM), January 1997

BENEFITS RATHER THAN COSTS

Industrial lobby groups such as US National Association of Manufacturers (NAM) and the Global Climate Coalition (GCC) have been sounding the alarm bells over the costs of climate change abatement in terms of reductions in economic growth.

One study by economic consultancies WEFA Group and H. Zinder [1], commissioned by the GCC, claims economic losses of between 3 and 3.5% of GDP for the US if a 20% CO_2 emission reduction target by 2005 is implemented.

However, there are also many studies projecting **very low, zero or even negative costs** for emission reductions [2], as the Inter-Governmental Panel on Climate Change (IPCC) has highlighted. In fact, high cost studies like that from WEFA/Zinder are **fundamentally flawed**.

- **They assume that emission reductions can only be achieved through the imposition of an enormous carbon tax.**

The low price elasticity of energy (especially electricity) demand means that taxes have to be high to achieve any given emission reduction target, if no other measures are implemented.

Many other studies have found that if carbon taxes are part of a wider tax reform and coupled with reductions in labour taxes (as well as energy efficiency policies), they can have positive effects on jobs and incomes.

- **They are based on unrealistic model assumptions.**

These studies use so-called **'top-down' models** which treat the energy sector and technology in a very simplified way, not taking account of large **'no regrets'** potentials. Conversely, so-called **'bottom-up' models** [3] have consistently reported low to negative abatement costs.

- **These assessments solely focus on GDP effects, which cannot necessarily be equated with employment or welfare losses.**

- **They only consider mitigation costs, ignoring both the positive side effects inherent in greenhouse gas mitigation strategies and the high costs likely to arise from climate change damage.**

In reality, greenhouse gas emissions abatement will have many economic benefits.

> *'the efficient use of energy ... has been a major contributor to the growth in living standards'*
> Keith Taylor, Esso chairman, Essoview November 1996

Efficient use? Our economic systems are riddled with inefficiencies. Current patterns of energy use are **extremely wasteful** (e.g. even the best coal-fired power stations are only 38% efficient). More efficient energy production and use makes both economic and environmental sense, and climate change targets can act as a catalyst for policies to overcome well documented obstacles;

According to some economists [4], there are good theoretical reasons, backed up by both model simulations and empirical estimates to expect that carbon taxes could partially and totally offset negative economic effects arising from the increased price of energy;

While carbon taxes can play an important role in emission reduction policies, they need to be combined with other measures such as standards, subsidies and voluntary agreements; Such **comprehensive approaches** require much lower carbon taxes and are thus less likely to have negative economic effects;

Fossil fuels (especially coal) are supported by huge **public subsidies**. Phasing-out these subsidies will release money for public investments;

Abatement can avoid some of the substantial economic costs arising from climate change, e.g. through **damage from weather extremes.**

While there is good evidence that climate change abatement will be economically beneficial in overall terms, there will be winners and losers. Among the losers will be the fossil fuel industry, unless it starts investing in renewable energies and efficient technologies now.

MODELS AND THE GDP FALLACY

Models, by their very nature, present **simplified versions of reality**. Most models, in particular 'top-down' ones solely focus on macro-economic effects in terms of **GDP**, ignoring other issues such as employment effects. Furthermore, they do not take into account the economic and social costs which might follow from damage caused by climate change.

Reliance on GDP as the sole indicator of cost or benefit is a major shortcoming of such economic assessments, whether they report positive or negative GDP effects. It has been long recognised that GDP is not a good indicator of social or environmental wellbeing as it only measures economic activity. Many countries display impressive GDP growth rates but also have high levels of social deprivation and environmental degradation.

Perversely, environmental damage through climate change (e.g. storm damage) could have some positive GDP effects as clean-up, rebuilding etc would all increase economic activity. GDP figures also hide distortions in the economy caused by subsidies for unsustainable energy sources.

To make a full assessment of climate change abatement costs and benefits, it is thus necessary to look both at current **distortions** in the economy and at the potential costs from climate change damage.

FOSSIL FUEL SUBSIDIES

Removing fossil fuel subsidies has to be a cornerstone of 'no-regrets' emission reduction strategies.

> *'A number of studies indicate that global emisssions reductions of 4 to 18%, together with increases in real incomes, are possible from phasing out fossil fuel subsidies'.*
> IPCC, 1995

The energy sector has long been one of the most subsidised economic sectors. Fossil fuels are supported through various kinds of subsidies:

- producer subsidies (mainly for domestic coal e.g. Germany)
- subsidised energy prices (mainly ex-Soviet Union and Central and Eastern Europe)
- oil exploration subsidies (e.g. US)
- grants for fossil fuel R&D
- aid money for fossil fuel development

In 1992, the year the climate convention was signed, global fossil fuel subsidies were estimated at $235 billion net of tax, equivalent to $45 per ton of carbon [5]**.** The former So-viet Union accounted for the bulk of these subsidies ($163 billion), mainly because of hi-ghly subsidised domestic and industrial energy prices. Central and Eastern European Countries, China and energy-exporting less developed countries account for much of the rest but some G7 countries also have high subsidy levels.

Coal and other fossil fuel subsidies have seen reductions in recent years in some countries such as the UK, although for economic rather than climate change reasons. However, they are still substantial in many G7 countries, in particular Germany, as table 1 shows.

Table 1: Fossil fuel subsidies in G7 states in 1995

Country	**type of subsidy**	**amount (1995 US $)**
Canada	fossil fuel R&D	$53.46 million
France	coal producer subsidy fossil fuel R&D	$901 million $44.5 million
Germany	coal producer subsidy other assistance* fossil fuel R&D	$6.9 billion $8.9 billion $22.46 million
Italy	Sardinian coal mining/gasification project	$11 million
Japan	coal producer subsidy other assistance* fossil fuel R&D	$ 993 million $ 1.07 billion $ 480.44 million
UK	coal producer subsidy other assistance* fossil fuel R&D	$263 million $942 million $9.85 million
United States	fossil fuel R&D	$459.5 million
Total for 1995		**$ 21 billion**

* other assistance includes government payments for retraining programmes, redundancy schemes, grants to pay off liabilities etc.

More up-to-date figures are hard to get hold of. The current subsidy level for Russia is also uncertain. Producer subsidies in 1994 were estimated at $3.6 billion and price subisidies at 4% of Russian GDP [8], although prices have increased considerably since then.

However, even assuming some reductions in subsidies in the last two years, **since signing the climate convention in 1992, fossil fuel subsidies in G7 countries have amounted to at least $100 billion,** and up to $500 billion in Russia.

Removing producer and R&D subsidies and rechannelling them into energy efficiency and renewable energies would have major environmental and economic benefits.

A German study for a local utility has estimated that 1850 net jobs could be created with an investment of DM 1745 million [9]. Hence, removing Germany's coal producer subsidies and reinvesting them in DSM could create over 10,000 jobs, providing compensation for job losses in mining. Additional jobs could be created through applying a carbon tax and using its revenue to reduce labour taxes.

It has been estimated that by removing energy price subsidies, Russian CO_2 emissions in 2010 would be 16% lower than if prices were at 1990 subsidy levels [7].

THE TRUE COSTS OF CLIMATE CHANGE

Climate change itself has enormous economic cost implications which are not taken account in any of the economic modelling studies. Estimating the costs of the impacts of climate change is far from straightforward. Apart from the uncertainties about the exact impacts of climate change and hence its costs, the economic valuation of damage is difficult, especially as far as loss of human life and various social costs are concerned. Nevertheless, valuation studies provide some Sources: [6] IEA (1996), [7] Greenpeace 1997 indications of the kind of costs to expect from the impacts of global warming.

The IPCC [10] provides a comprehensive survey of valuation studies. According to this, damages for developed countries range between 1 and 2% of GDP for a doubling of CO_2, while those in different developing regions range from a minimum of 2% to a maximum of 9%. For the US, total cost estimates for a 2.5° C warming range from $61.1 billion to $74.2 billion of annual damage.

As mentioned before, GDP only gives a partial picture of costs or benefits. Such a warming would also bring with it various costs which cannnot be measured easily in monetary values.

Predicted global damage associated with a 2.5° C warming:

1,235 km^2	lost forest area
6,829,000 t	reduced fisheries catch per year
230.7 km^3	reduced water availability
253,000 km^2	lost wetland area
137,700	extra deaths per year
2,734000	additional migrants

Source: IPCC, 1996

Meanwhile, there are secondary benefits of CO_2 abatement. One study for the UK has estimated benefits of 0.4 to 0.7% of GDP, mainly through reduced emissions and reduced traffic congestion [11].

FIRST SIGNS? INCREASED DAMAGE COST FROM WEATHER EXTREMES

One of the predictions of the climate scientists is that weather extremes will become more frequent. More heavy rainfall events and more frequent or severe droughts are likely. According to the IPCC, small changes in the mean climate can produce relatively large changes in the frequency of extreme events.

Table 2: 1996 weather extremes causing over 1000 million US $ in damage each

Date	Damage event	Country	Total cost Mill. US $
January	'Blizzard of 1996'	USA	1200
Jan./Feb.	blizzards, floods	USA	3000
May/June	drought	USA	3600
May	tornados, floods	USA	1700
June	floods	China	24000
July	floods	Canada	1100
July/ August	floods	Korea	2300
Sept.	Typhoon Herb	Taiwan, China	1200
October	Typhoon Sally	China, Vietnam	1200
	Hurricane Fran	USA	3000
	floods	India	1500

Source: Munich Re (1997)

Extreme weather events can have large impacts on nature and human society and there is some evidence that the frequency of such events has increased over recent decades. Also, we are seeing more and more record breaking events such as:

- in the UK, the first 4 months of 1997 were the driest since records began 150 years ago, with the River Thames at 1/3 of its normal flow
- April 1997 saw unusually severe flooding in North Dakota (US) and Manitoba (Canada)
- in 1996, China saw its worst floods in 150 years, resulting in over 3000 deaths and $24billion worth of economic damage

Insurance companies are increasingly concerned about the potential impact of climate change on their business. In 1996, weather extremes caused $60 billion worth of damage, down from over $100 billion in 1995. Costs to insurance companies amounted to $9 billion.

Even some principally positive extremes, such as a very warm summer in Northern Europe, can have high economic costs:

- In the UK, the summer of 1995 was the warmest and driest on record. A study for the Department of the Environment found that negative economic effects exceeded positive ones. Negative effects included losses of £200 million in livestock farming, £96 million in additional water supply costs, as well as record losses by the insurance industry for subsidence-related damage [9].

CONCLUSIONS

- The results of studies predicting high greenhouse gas abatement costs have to be treated with caution. Modelling structures and assumptions can give a very one-sided assessment.
- There are many studies predicting positive GDP effects, as well as good job creation potentials for abatement strategies.
- GDP assessments provide a very partial picture. Social and environmental implications of abatement strategies and the potential economic, social and environmental costs of climate change damage need to be taken into account.
- There is a large potential for 'no-regrets' strategies which must be tapped now.
- In view of the huge potential damage costs from climate change, precautionary action is necessary now.

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