
# UNINTENDED CONSEQUENCES OF CLIMATE CHANGE POLICY

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# Foreword

**by William Happer**

Has there ever been a movement in human history that did not present itself as an ethical cause? Ghengis Khan supposedly informed his victims: 'I am the punishment of God. If you had not committed great sins, God would not have sent a punishment like me upon you!'

In this report Andrew Montford summarizes the unexpected outcomes of a modern cause, the jihad against atmospheric carbon dioxide. Like its predecessors, this cause has generated plenty of sanctimonious slogans: 'intergenerational justice', 'saving the planet', 'sustainability', 'negligible carbon footprints'. In reality, the cause has brought ugly, bird-killing windmills, which have replaced the psalmist's 'cattle on a thousand hills'; hapless native peoples have been expelled from their ancestral lands, sometimes at gunpoint, so wealthy corporations and foundations could claim to be saving the planet, at no small profit to themselves; fraud in the trading of carbon credits has cheated honest taxpayers. But for this cause, as for most of its predecessors, the end justifies the means.

Policies to 'stop climate change' are based on climate models that completely failed to predict the lack of warming for the past two decades. Observational data show clearly that the predictions of unacceptable warming caused by more carbon dioxide are wrong. Economic discount rates aside, policies designed to save the planet from more carbon dioxide are based on failed computer models.

The desperate attempts to save the cause with one improbable excuse after another are reminiscent of the attempts, at the end of the eighteenth century, to save the phlogiston theory of combustion, as it reeled from one observational blow after another. In the process, real damage has been done to the reputation of science and to the scientific method. Data has been manipulated, honest scientific debate has been stifled, educational institutions have been turned into brain-washing centers for the cause, and trusting citizens have been misled by much of the mass media.

And what is the great danger that this noble cause purports to save us from? Human emissions of carbon dioxide, a transparent, odorless, non-toxic gas, essential for plant growth and contained at about 40,000 parts per million (ppm) in our own breaths. Carbon dioxide has been mercilessly demonized as 'carbon pollution', when in fact it is a benefit to the planet. Agricultural production has increased substantially and the Earth is greener today with the 400 ppm current levels of carbon dioxide than it was with preindustrial levels of about 280 ppm. And two or three times higher levels would be even better.

Over most of the Phanerozoic eon – the last 550 million years – carbon dioxide levels have averaged several thousand parts per million, and life flourished abundantly, on the land and in the seas. There is no observational support for the theoretically dubious claim that 'more carbon dioxide will cause unacceptable global warming, or more extreme weather'.

For questions that are answered with equations in physics, there is an old saying, only half in jest: 'getting the sign right is the hardest thing'. There is an ethical question connected with attempts to control carbon dioxide emissions. And many people have gotten the wrong sign for the answer.

William Happer
Princeton, 2014

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## Summary

At the heart of much policy to deal with climate change lies an ethical approach to the question of intergenerational equity, namely that current generations should avoid passing costs onto future ones, who can play no part in the decisions. In fact it has been said that this is the only ethical way to deal with global warming, although this is not true – professional economists have identified several alternatives.

Working within this ethical framework, governments have taken expensive policy steps to prevent the costs of climate change falling on future generations, for example by fixing energy markets in favour of renewables or by instituting schemes to cap and trade carbon emissions. There has been an unfortunate and bewildering array of unintended consequences that refute the 'ethical' label for the framework:

- clearing of rainforests
- human rights abuses
- hunger and starvation
- destruction of valued landscapes
- slaughter of wildlife
- waste
- transfers of wealth from poor to rich
- fuel poverty and death
- pollution
- destruction of jobs
- higher-than-necessary carbon emissions.

In view of the damage done by this 'ethical' approach this report calls for a public debate on alternative approaches to intergenerational equity and for an end to the measures that are currently being used to address it.

# 1 The ethical choice

## The focus on ethics

At the heart of climate policies around the world is an ethical idea – an idea about how the competing interests of current and future generations should be weighed. In the view of some economists and many environmentalists, because future generations have no say in current policy decisions it is unethical to pass costs onto them; avoiding such cost transfers therefore becomes central to the policy process.

In traditional cost–benefit analysis future costs are discounted so that they appear of lesser weight in the final reckoning. However, if the aim is to avoid passing costs to future generations, a very low or even nil discount rate is used. Costs incurred far into the future thus appear to be of equal weight to costs incurred in the present, providing a strong incentive for people alive today to spend now in order to prevent costs falling on their children and grandchildren.

The use of low discount rates is not a new approach, dating back at least to the 1990s and the work of William Cline.[1] Its best known application, however, has been in the Stern Review. In 2005 the UK government commissioned a report into the economics of climate change from the head of the Government Economic Service, Sir Nicholas Stern. Stern and his team reported their findings in October the following year, concluding on the basis of an economic model that incorporated low discount rates that deep and immediate cuts in emissions of greenhouse gases were required. These emissions cuts were to be prompted by higher energy prices and lower consumption.

Stern's conclusions about the need for emissions reductions only hold if his position on intergenerational equity – in other words his use of a low discount rate – is accepted. However, this is not the case and the approach has been widely disputed; other commentators have noted that several equally plausible approaches exist. For example, observing that future generations are expected to be wealthier than people today, one could argue that consumption should be equal across the generations and that we should therefore be encouraging *lower* energy prices and *greater* consumption for current generations.[2]

Intergenerational equity and discounting approaches have divided both economists and philosophers for many years and the arguments are unlikely to be resolved in the near future. In this report we will merely observe the consequences of this 'ethical' approach in the real world, focusing particularly on the UK government policy, but touching from time to time on other countries. First, however, we will outline policy responses in the UK.

## The policy – market fixing

Stern largely eschewed recommending policy measures in his report, arguing only that carbon dioxide emissions needed to be priced, either through a carbon tax, regulation, or a cap-and-trade system. However, the report was a significant enabler for the government of the time, allowing them to accelerate the pace of responses to the perceived threat of global warming. Among these responses was the Climate Change Act of 2008, a piece of legislation that can best be characterised as a return to 1940s central planning. The Act introduced a target-driven approach to carbon dioxide emissions, committing the UK to an extraordinary 80% reduction in greenhouse gas emissions by 2050.

The government could have adopted a number of different approaches to achieving its target, but chose to do so through a series of heavy-handed attempts to fix energy markets, by encouraging renewables and penalising fossil fuels.

Renewables were encouraged through two main policy tools. Firstly there was expansion of the Renewables Obligation, a scheme that required power generators to obtain a specified proportion of their energy from renewables. Secondly, 'feed-in tariffs' encouraged small-scale renewables generators by fixing prices for the energy they sold at far above the market rates.

Meanwhile, fossil fuel production was actively discouraged by raising the prices borne by consumers. For example, the Supplementary Charge – a supertax on UK oil and gas fields – was raised from 10% in 2002 to 32% today. Together with corporation tax, these rates mean that some oil and gas fields now suffer a marginal tax rate of 81%. Meanwhile, fuel duty has been put on a price escalator and a tax on airline departures has been instituted, all in the name of saving the planet. Finally, further costs have been loaded onto fossil fuels by the European Union, which has instituted a cap-and-trade scheme for carbon emissions.

# 2 Technological…solutions?

## Biofuels

### Biofuels mandates – 'crimes against humanity'

One major component of renewables policy has been the use of biofuels in transport fuel. Even before Stern had completed his work, concern over greenhouse gases had produced a strong push for increased use of biofuels, cheered on by NGOs such as Friends of the Earth,[3] by the farming industry whose members saw the extraordinary potential for raising farm-gate prices,[4] and also

by academics, some of whom claimed potential emissions savings as high as 70%.[5] Biofuel use was encouraged through a small reduction in fuel duty, but this turned out to be insufficient to overcome their adverse economics. More coercive measures would be required, as will be described below.

Those involved in the struggle to feed the world's population were appalled by these moves to increase production of biofuels. In 2007, the IMF issued a statement of concern,[6] and the UN's special rapporteur on the right to food went so far as to describe the use of biofuels as a 'crime against humanity'.[7] However, as we will see, the influence of climate campaigners and agribusiness was too strong for these voices of protest to have any effect.

In Brussels, the farming lobby was in the process of subverting the EU policymaking process. The EU already had a biofuels directive dating back to 2003, which set a voluntary target for biofuel use of 5.75%. However, there is now good evidence that key officials within the EU commission were persuaded by lobbyists for the farming industry to write new legislation that overlooked overwhelming scientific evidence that biofuels were inefficient and that their introduction would have disastrous consequences.[8] The result was a new EU directive mandating a 10% share of the transport fuel market for biofuels.

In the UK, pressure from lobbyists had a similar result and a Renewable Transport Fuel Obligation required that from 2008 an increasing proportion of fuel be derived from renewable sources, with a target of 10% to be reached by 2010.

The introduction of biofuels mandates across Europe – similar legislation was put in place in the USA as well – has had very deleterious effects. A few examples of the damage wrought by first-world legislators are outlined below.

## Rainforests cleared for palm oil

Governments in South-East Asia have earmarked palm oil as a promising product for meeting demand for biofuels. Previously used mainly for cosmetics and food, palm oil production has been ramped up in recent years, with Malaysian production doubling and Indonesian production more than quadrupling between 1992 and 2010.[9] The rise in demand is attributable to two main factors: the Chinese food industry and biofuels production in Europe.[10,11]

The result has been the felling of large areas of rainforest, with Indonesia alone reporting the clearing of as much as ten million acres – an area approximately twice the size of Wales – to make way for palm trees. While one can argue in favour of the right of forest-dwellers to exploit their land in order to improve their lives, there is no doubt that the destruction of these forests is an unintended consequence of biofuels policy, and surely one that would have horrified its framers.

What is worse, the clearing of the land to make way for the plantations itself releases greenhouse gases into the atmosphere, entirely negating the objective of the whole exercise.[12]

## Jatropha and sugarcane drive Africans from their land

The artificial demand created for biofuels had inevitable consequences on demand for farmland, and in some parts of the world there has been a wave of land transfers, with subsistence farms replaced by agro-industrial enterprises seeking to take advantage of the biofuels bonanza. By 2010, the World Bank was reporting that a fifth of such land transfers were driven by biofuels; one later report suggested that the real figure was more than half.[13,14] Other estimates are lower, however.[15]

Opponents have described the investors as engaging in 'land grabs', and in places with only weak property rights it is likely that the term is apposite. However, it should also be recognised that the introduction of modern farming technology is likely to be a significant *beneficial* consequence of biofuels policy, albeit still an unintended one.

In Africa, much of the demand for land comes from those wanting to plant jatropha and sugar cane for biofuels. The struggle to control the biofuels business is reported to have been a contributory factor in political violence that swept parts of Kenya at the end of 2012.[16]

## Corn ethanol causes hunger

The USA has promoted the use of biofuels from as far back as the oil crisis of the 1970s and there has been a steady increase in biofuels production since that time. However, encouraged by a farm lobby that is always keen to have a guaranteed market, from 2005 US policy mandated the blending of a rising proportion of biofuels into transport fuels. By 2012 that proportion had risen so high that some estimates suggest that 40% of the US corn crop was being used for ethanol production.[17]

The impact of these changes on global food prices is hotly disputed, and indeed the effect on prices is hard to isolate from all the other factors that influence them, such as changing eating habits and the weather. However, it is undoubtedly true that prices are now higher than they would have been without the biofuels mandates and tax incentives. The World Trade Organisation and the US Development Agency have both explicitly stated that the problem of high food prices is linked to biofuels mandates,[18] a position that is also echoed by a variety of NGOs. One study has estimated that biofuels could be causing as many as 192,000 excess deaths per year.[19]

Meanwhile, despite the stated purpose of biofuels being the reduction of greenhouse emissions, evidence that they do not actually do so has become overwhelming. As we have seen, early advocates of biofuels suggested that they could reduce carbon emissions by as much as 70%. However, these figures have turned out to have little basis in fact. The biofuels researcher Timothy Searchinger has calculated that once the massive release of greenhouse gases caused by converting grassland and rainforest into cropland is taken into account, introduction of biofuels produces increases in greenhouse emissions, the size of the rise being as much as a doubling for corn ethanol production.[20,21]

## Woody biomass

### Green energy subsidies damage wood panel industry

The use of forest products to generate energy has been encouraged by government, with the UK one of the few countries to promote this form of generation on a large scale. Wood may be used in various forms, either in dedicated plant or co-fired with other fuels.

However, once again the wish to be seen to be acting on climate change concerns has led to the consequences of this policy being brushed aside and ignored. For example, the UK's bioenergy strategy makes the following observation about woody biomass:

> Using small roundwood and sawlogs as a source for materials and bark and branchwood as a source for bioenergy (i.e. a 'conventional product mix' in terms of priorities for coniferous wood use) is often the optimal use of the forest wood. With respect to small roundwood and sawmill residues, [greenhouse gas] reductions can be achieved through some use for bioenergy as well as for materials depending on how the wood is processed, transported and used.[22]

These comments are highly misleading. There are few parts of a tree that are not already used downstream from the forest. Apart from the high-value trunk, small round-wood and sawdust are the primary raw materials of manufacturers of chipboard and MDF, while bark is used in the tanning and horticultural industries. The inevitable, but unintended consequence of the subsidising of biomass energy generation is therefore to raise costs in the markets for these materials. As the bioenergy strategy itself quietly recognises, these prices rises will inevitably have to be passed on to consumers,[23] leaving UK board manufacturers dangerously exposed to overseas competition. As one wood panel retailer explained to his customers:

> Demand for timber products across Europe has increased considerably, largely based on new power stations using timber for biomass fuels. This will lead to increased timber costs and could lead to actual timber shortages and factory closure in the MDF, particleboard and [oriented strand board] sectors.[24]

Even without competition from existing wood users, the sheer quantities of wood required for a large power plant make local supply of fuel simply unfeasible. Many UK-based generators expect to import wood chips from the USA, where a decline in demand for roundwood as a result of the economic downturn has caused a temporary increase in supply. It has long been recognised that the low-energy density of biomass makes transport over large distances uneconomic,[25] but with the Renewables Obligation in place these issues can be overlooked by generators. Moreover, it is clear that when North American demand bounces back the need to maintain the supply of fuel will create pressure to fell forests for fuel. As a report written for the EU put it:

> …future flows of biomass from and to the EU risks not only damaging ecosystems in other parts of the world, but will also [risk] increasing the EU's own carbon footprint[26]

Indeed, there are reports that clearcutting of North American forests has already begun.[27]

## Windmills

In the UK, feed-in tariffs and the Renewables Obligation have made possible inefficient forms of energy generation. Attention has mainly focused on wind energy.

### Subsidies for landscape blight

The need to capture as much wind as possible has led to enormous pressure to site turbines in the much-loved landscapes of Britain's upland areas, where wind speeds can be expected to be high. But even areas of outstanding natural beauty at lower altitudes have not escaped the attentions of windfarm developers, with Berkeley Vale in the Cotswolds, for example, subject to a recent, although ultimately unsuccessful, attempt to build a large wind park.[28]

Wind turbines are extraordinarily inefficient in terms of their use of land, requiring hundreds of times more space per megawatt of output than conventional power stations. The construction of a wind farm can therefore have a devastating effect on landscapes. Wind turbines can have detrimental effects at more local scales too: forests must often be cleared to make room for

the turbines, as well as a wide swathe around them in order to prevent turbulence from affecting the blades.

Scotland, which has the UK's most aggressive policy on wind farms, has already cleared 60 square miles of forest for wind farms, a figure that is expected to reach 240 square miles in due course.[29]

As well as the space required for the turbines themselves, access roads often have to be cut through the landscape to allow for construction and maintenance. This in itself can sometimes have a dramatic impact (see Figure 1).

**Figure 1:** Windfarm access road in Cefn Croes, Wales

Even then the destruction of the landscape is not finished. New wind farms generally need to have a new and dedicated connection to the electricity grid. Since, as we have seen above, wind farms are often sited in remote areas, the lines of pylons required are often very long, unsightly and expensive.

Once again it is not only the physical space required by the pylons that is the problem. Forests must be cleared around them, and gashes that can be as much as 300 m wide must be cut through the landscape. In Scotland the Beauly–Denny interconnector will pass through the Cairngorms as well as the DrumochterHills SSSI, while in Wales the plan is to build pylons through the iconic Vyrwny valley.

Because wind farms are dispersed across the country rather than concentrated in a few sites, as gas-fired power stations are, the number of grid connections the wind fleet requires is very high. Figure 2 shows the scale of wind farm developments in the UK. It is clear that once these plants have been constructed there will be few views that are not scarred either by windfarms or by the pylons that connect them to the grid.

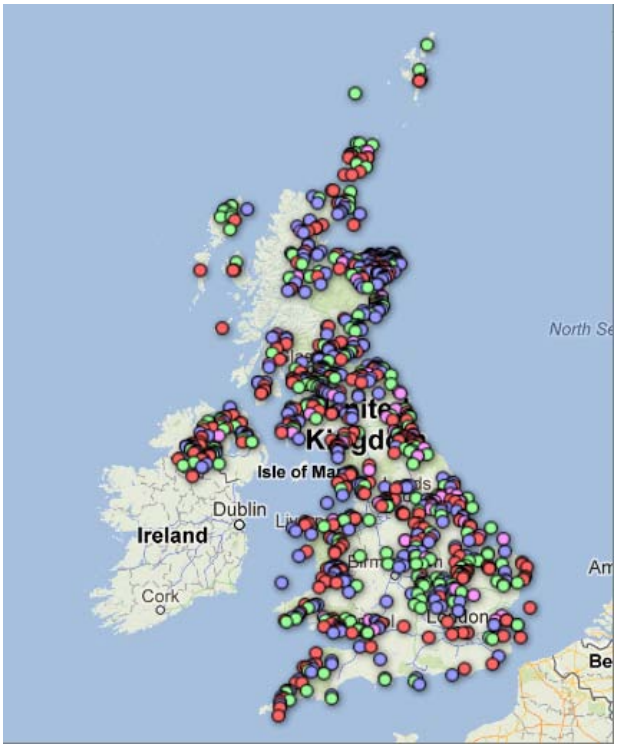


**Figure 2:** Windfarms in the UK

Key: green, consented; blue, planning; violet, under construction; red, operational. Source: http://www.webcitation.org/6E49AwPLw.

### Polluting the East to 'clean up' the West

Wind turbines contain magnets to enable them to generate electricity. These magnets are now mostly made from an alloy containing iron, boron and a less familiar element called neodymium, the latter being a silvery metal that is mostly produced in China. Its extraction and refining is highly polluting.[30] Despite this, production of neodymium is expected to grow at a rate of 10–15% per year,[31] chiefly due to demand from 'green' industries in the developed world, namely magnets for use in wind turbines and electric cars.

## Grid inefficiency and carbon emissions

While arguments about the introduction of wind energy onto the electricity grid are made insistently by the renewables industry and environmentalists, little mention is made of the effects of wind on the rest of the grid.

Wind power generates an uncontrollable output that is constantly varying, meaning that it is unsuitable for peak load. Wind power can therefore only be used to provide base load and because of this it tends to displace nuclear power and the most efficient gas turbines from the grid. Then, in order to balance supply and demand, the rest of the grid has to ramp up and down to match the fluctuating (and often wildly fluctuating) output of the wind turbines. The result is that energy generators that were previously operating at optimum efficiency become much less efficient and produce more carbon dioxide emissions than they would have done previously.

Although it is probable that introduction of wind power onto the grid produces a net reduction in carbon dioxide emissions, it is possible, or even likely, that a grid based entirely on gas turbines would actually produce carbon emissions that were lower still.[32] The civil servants and legislators who framed the Renewables Obligation probably did not consider the possibility that their market activism would produce higher emissions than necessary, or that the cost would be an order of magnitude greater than simply letting the market take its course.[33] Nevertheless, this appears to have been one of the unintended consequences of their good intentions.

## Keeping tourists away

In 2002, in the early days of windfarm development in the UK, two wind industry bodies, the British Wind Energy Association and the Scottish Renewables Forum, commissioned a poll of tourists in Argyll, which found that the vast majority of the respondents reported that the presence of these windfarms had had no effect on their impressions of the area and had not changed the likelihood that they would visit again.[34]

However, as with many polls of this kind, careful reading of the survey conveys a slightly different story. At the time there were only three wind parks in Argyll and only one in five of those surveyed had actually seen one of them. So when the poll's authors concluded that 'the wind farms are not seen as having a detrimental effect', this was only true of a situation in which there were a handful of such installations.

As more and more wind parks were constructed, the pretence that tourists were not put off by their presence began to fall apart. By 2012, Scotland had installed nearly 3000 turbines and with applications coming in at nearly seven

each day, and new surveys suggesting that as many as a quarter of visitors were being put off by the industrialisation of the landscape, tourism chiefs felt moved to act. While stating that they were not opposed to wind farms in general they issued their first objection to a wind farm planning application.[35]

### Effects on wildlife

Assessments of the impacts of wind farms on wildlife have generally focused raptors. However, while there is abundant evidence that birds are regularly killed by wind turbine blades, some studies have found that mortality rates are insufficient to bring about an overall population decline.[36]

Evidence of windfarm impacts upon bats – which are protected species in the UK – are much more clearcut. Researchers have found that the passing of a turbine blade causes a sudden pressure drop that is of such a magnitude that it can cause bats' lungs to explode. The effects appear widespread and hard for bats to avoid. As the US Geological Survey reports:

> Despite the improvements to turbines that have resulted in reduced mortality of birds, there is clear evidence that bat mortality at wind turbines is of far greater conservation concern. Larger and taller turbines actually seem to be causing increased fatalities of bats...Bats of certain species are dying by the thousands at to be those that rely on trees as roosts and most migrate long distances…[37]

In 2007 a survey by the US National Research Council concluded that fatality levels of bats might be high enough to affect overall population levels.[38] There is little doubt that the situation is similar in continental Europe[39] and the UK. Remarkably, one solution proposed has been to switch off the turbines when the bats are most at risk, a proposal that would make a grossly inefficient technology even more inefficient.[40]

## Solar PV

### Toxins and teratogens

Solar panels contain highly toxic materials, some of which were described in an article in the *Guardian*:

> Solar modules contain some of the same potentially dangerous materials as electronics, including silicon tetrachloride, cadmium, selenium, and sulfur hexafluoride, a potent greenhouse gas.[41]

Large photovoltaic installations often use cadmium/tellurium cells.[42] Cadmium is highly toxic and indeed one of the six substances banned by the EU's Restriction on Hazardous Substances directive, although an exemption has

been made for solar panels. Tellurium is an element that the Royal Society of Chemistry has described as 'highly toxic and teratogenic',[43] the latter term referring to a chemical's tendency to produce deformed offspring in pregnant women.

In the form in which they are used, these materials present few risks to the environment, particularly since they are sealed off from the elements between sheets of glass. However, over the longer term, there are significant risks. Keeping the toxic contents of photovoltaic cells out of the natural environment requires careful recycling at the end of their lives.[44] Although some manufacturers have instituted such recycling schemes, it is unclear at present whether this will ever be an economic proposition,[45] and it may be that as governments' willingness to support solar PV projects wanes, the toxic cells will simply be abandoned.

This being the case it is probable that environmental contamination will turn out to be an unintended consequence of the subsidising of photovoltaics.

### Fraud

The feed-in-tariffs regime gives the operators of renewables plant returns far above market prices for the power they generate. In some countries with similar regimes for renewables, the absurdly high prices have led to considerable levels of fraud. In the past, operators have found it profitable to use diesel generators to produce electricity, which they sold on to the grid on the pretence that it had come from a solar array. This fraud was only detected when regulators noticed that operators were able to generate electricity at night.[46]

## CFLs

### Toxic lighting

Despite the fact that lighting costs represent just 3% of the typical energy bill,[47] environmentalists and big business have taken a keen interest in reducing this cost further. Much of the impetus has come from the United Nations Environment Programme, through its 'en.lighten' programme,[48] which involves the big lighting manufacturers Philips and Osram as well as green organisations like the Global Environmental Facility. An analysis by the Dutch news magazine *Elsevier* has tied the introduction of the incandescent lightbulb ban directly to an alliance of environmentalists, seeking to advance their cause, and big business, keen to promote new, high-tech, high-margin products over incandescents.[49]

The favoured replacement for these lightbulbs has generally been compact fluorescents (CFLs), an expensive alternative which has been criticised for the poor quality of light it gives. Users have also suffered from poor quality products[50] and have discovered to their dismay that the extra expenditure they have been forced to incur has brought them a product that often does not actually last any longer than the cheaper incandescent bulbs they replaced – the extended lifetimes of CFLs are not realised where lights are switched on and off regularly.[51]

What is worse, CFLs contain mercury, an element considered so toxic its use is now banned in schools; indeed, so great has concern become over mercury that a treaty aimed at phasing out its use has now been agreed at the UN.[52]

Research has suggested that mercury vapour levels from broken CFLs can exceed approved safety levels,[53] and there are obvious risks of environmental contamination from incorrect disposal. Concerns have also been raised about other toxins used in CFLs. Researchers found that the bulbs emit known carcinogens, such as phenol, naphthalene and styrene, when they are switched on.[54]

CFLs have proved so unpopular that attention is now shifting to light emitting diode (LED) lighting, a move that will be accelerated by the forthcoming mercury phase-out. But while LED systems have as yet revealed few of the toxicity or reliability problems of CFLs, with a single bulb retailing at between £10 and £20, it appears that consumers will be forced to incur substantial further costs to appease the demands of environmentalists.

## Recycling

The decision as to whether to recycle something is a subtle question of economics, requiring careful consideration of benefits and costs (including costs borne by others). Many scarcer and expensive items, such as aluminium and gold, have always been recycled because the benefits so clearly outweigh the costs. Other very cheap and plentiful items should not ever be recycled, however, because the cost of collecting, sorting and processing them clearly outweighs the benefits. In the middle is a group where the lines are less clear cut.[55]

However, central diktat ignores all these subtleties and in these circumstances climate change is often used as a convenient justification for demanding that *everything* be recycled. This blind adherence to a mantra of 'reduce, reuse, recycle' can have perverse and unforeseen consequences. For example, government puts enormous efforts into encouraging the recycling of glass. While recycling does use less energy than making virgin glass, the difference

is not large enough to make this recycling happen voluntarily and there can be quality issues with the recycled material anyway. In addition, there is almost no market in the UK for green glass, which is used almost exclusively for bottling wine. Recycled green glass therefore has to be shipped great distances at public expense or, more likely, it is ground up and used as hardcore for roads, a process that probably uses more energy than simply disposing of the glass in the first place.[56]

The story with paper is slightly different. Recycling old newsprint requires use of toxic chemicals to bleach and clean the paper. In normal circumstances this would not be done since paper is a relatively cheap and completely renewable resource. However, the advent of government interference in this area has led to recycled paper being used for food packaging, with perhaps inevitable contamination of products caused by the chemicals and bleaches used in the recycling process.[57] In addition, rubbish – particularly plastic – is now being shipped around the world to be recycled.[58]

# 3 International angles

## Clean development mechanism promotes global warming

### Introduction

In 1997, the international community agreed the Kyoto Protocol in an effort to reduce carbon dioxide emissions. Those countries that ratified the protocol committed to future reductions in carbon emissions.

Among the measures agreed under the protocol was the Clean Development Mechanism. This allowed wealthy countries to meet some of their commitments on emissions by buying emission reduction credits (known as CERS) from approved projects in developing world. The idea was that the wealthy countries would get a relatively cheap way of meeting their Kyoto commitments while the poorer countries would be paid to develop in an environmentally friendly way.

### Less global warming means more global warming

One of the most important projects approved under the Clean Development Mechanism involved encouraging the destruction of a gas known as HFC23, a by-product of the manufacture of refrigerants. Because HFC23's potency as a greenhouse gas is 11,000 times that of carbon dioxide, destruction of a single tonne of the gas could bring a factory in the developing world a payment equivalent to 11,000 CERS.

Because they were being paid for a by-product, factories found that payments under the CDM were extremely lucrative – indeed so lucrative that they came to dominate the economics of the industry. One estimate has suggested that a typical factory would be earning something between $20 and $40 million per year from destroying HFC23.[59]

The upshot of this influx of western money was to completely change the behaviour of the refrigerant manufacturers. Instead of HFC23 being merely a by-product of their manufacturing process, it came to represent their principal product, with refrigerants an inconvenient low-margin sideline. The factories were in effect being incentivised to produce this most powerful of greenhouse gases and, inevitably, output was ramped up accordingly. Before long HFC23 schemes came to dominate the Clean Development Mechanism, accounting for around 60% of CERS issued.

The UN had been warned about this problem as far back as 2004,[60] but it was only after the problem became an international scandal in 2009–10 that action was taken. By 2011 the scheme had been curtailed. However, the refrigerant factory owners were unhappy at losing such a reliable source of profits and essentially tried to blackmail the EU into reinstituting the payments, threatening to vent HFC23 directly to the atmosphere.[61]

The initial unintended consequence of the market interference by the UN was therefore to bring about increased emissions of the very greenhouse gas they were attempting to remove from the atmosphere. However, by 2012 the price of CERS had collapsed nearly to zero. This meant that even if the factories' western funding was forthcoming it would come at a much lower value. Suddenly, the Asian refrigerant factories found they had factories set up to maximise production of HFC23, for which they would now only be paid a fraction of what they had received previously. At the time of writing, the factory owners are poised to rid themselves of this problem by venting this powerful greenhouse gas production directly into the atmosphere, a consequence that was surely not intended by the framers of the legislation.[62]

## REDD and the rainforests

### Introduction

In 2005 a new scheme known as 'Reducing Emissions from Deforestation and Forest Degradation' (REDD) was set up with the intention of funding developing countries to create forest reserves and so help prevent global warming.

In the years running up to the introduction of REDD, the World Wildlife Fund (WWF) had persuaded the Brazilian government to allow it to manage vast areas of the Amazonian rainforest. With massive funding from philan-

thropists, the Brazilian state Bank, WWF was able to set up a new 20-million-acre reserve in the north of the country. In reality, however, the scheme had little to do with emissions reduction. So remote were the new protected areas that there was no risk of deforestation. Moreover, carbon sequestration is maximised by reforestation, not by maintenance of existing forest.[63] But if forests became accepted and measurable contributions to the battle to reduce carbon emissions, those that controlled them would find themselves sitting on a gold mine.

The answer to the question of measurability came from an advocacy group called the Woods Hole Research Centre, which devised an algorithm that they said allowed them to estimate the emissions savings from maintaining the rainforest. This methodology was accepted by the transnational community, keen to see REDD put into practice. The only thing standing between the environmentalists and their goldmine was a political decision to launch REDD. Unfortunately for their hopes, the Copenhagen summit of 2009 failed to provide support for REDD, restricting itself to agreement in principle, and putting off a final decision.

## Helping big business and carbon cowboys

Despite this failure to reach agreement on REDD, the prospect of its introduction had encouraged some businesses to buy into the rainforest. Not only did this offer 'greenwash' opportunities for major multinationals such as General Motors and Chevron, but it still held out the possibility of a later bonanza if pressure on governments could be brought to fruition. If REDD were to be put in place and if it incorporated trading of carbon permits, the profits accruing to those involved would have been enormous.

It was not only environmentalists and multinational businesses that were attracted by the scent of a profit; others were more obviously 'carbon cowboys'. For example, in the Peruvian Amazon, an unscrupulous Australian called David Nilsson persuaded many tribal leaders to give him their ancestral lands in return for vague promises of money and jobs. None of the rewards ever materialised, but Nilsson told an undercover journalist – probably falsely – that he had secured 3 million hectares of forest on a 200-year lease. On the expiry of the lease, he said, it would be possible to fell the forest and plant palm oil. As the journalist later put it, Nilsson's treatment of the indigenous peoples was 'a monumental double-cross, and an environmental travesty'.[64] Nilsson is now a wanted man in Peru, but the damage has already been done.

### Saving the rainforest, but for whom?

Fraud is, however, only the start of it. In one reserve owned by GeneralMotors and run by a local NGO called SPVS (on behalf of a larger American one called The Nature Conservancy), the demands of the scheme have led to locals being kept out of the forest they have worked for generations. Keeping them out has involved threats of violence, as a local man described:

> One day a group went out, looking for vines in an area belonging to our community. In our territory. So we were chopping down vines and some SPVS employees passed by. In their area they have some police that are called park rangers and they shot over us – they didn't get anybody. SPVS doesn't want us here. They don't want human beings in the forest. The land isn't even theirs, it's ours.[65]

There are similar stories from all over the world[66] and REDD has been condemned by many organisations supporting indigenous peoples.[67] However the scheme continues and has been expanded.

## The EU Emissions Trading Scheme

The EU Emissions Trading Scheme predates the Clean Development Mechanism and runs in parallel to it. The scheme covers 11,000 factories and power plants in 30 countries. Since its inception in 2005 it has been the subject of fierce criticism on several different fronts.

In the early phases of the scheme, big fossil fuel users – energy companies and big manufacturing concerns – were handed large numbers of free permits to emit greenhouse gases, at a volume that was often far in excess of their actual needs. These companies were then able to make enormous windfall profits by selling their permits on. The House of Commons Environmental Audit Committee has reported that this allocation of free permits is likely to continue, possibly until 2020.[68]

Although permits had been given away to energy companies for free, the effect has still been price rises for consumers. For these companies to choose to use permits for power generation, the profit from selling electricity needs to exceed the risk-free profit from selling the permits on, and in order to ensure this they have raised energy prices for customers. Sheltered from competition from outside the ETS, energy companies have been able to make the price rises stick (if they were not, UK consumers would have bought electricity from overseas and the energy companies would simply have sold their permits on – an equally perverse outcome). So despite the fact that permits are given out for nothing, the energy companies have made huge windfall profits from them.

Because of the recession, many big energy users have been cutting back on production anyway, leaving them with an even greater surplus of permits and still greater profits. Steelmaker Arcelor Mittal makes of the order of €500 million per year from its carbon-trading operations. A still more perverse side effect of the ETS has been to incentivise large energy users to scale back their operations or move them out of the UK, since doing so will bring them a further surplus of valuable carbon credits.[69]

The ETS scheme has also been subject to extraordinary levels of fraud. In one example, rogue carbon traders charged VAT when they sold permits, but did not pass on the tax to the UK authorities, instead diverting it to privately held accounts in the Middle East. This particular scheme cost the taxpayer £38 million, but estimates for the total cost of these frauds across the EU is of the order of £3 billion per annum.[70]

# 4 The haves and the have-nots

## Effects on the poor

The twin policies of price-fixing for renewables and burdening fossil fuels with taxes and carbon pricing have hit hardest at the poor. In 2000, the government introduced a legal obligation to eliminate fuel poverty by 2016. This target has, however, been cast aside in the wake of the panic over climate change. Hit by a double whammy of increasing gas prices and the government's climate change policies, fuel price increases have inflated the numbers of those in fuel poverty almost every year since 2002.[71]

Fuel poverty is not simply a matter of discomfort for those affected. For many, particularly the elderly, it can be a matter of life and death. In England and Wales there are typically of the order of 25,000 excess deaths each year in winter and an official study of the problem conservatively estimated that 10% of these might be attributed to fuel poverty. These two or three thousand individuals are direct victims of climate change policy, and their number is only expected to increase.[72]

Since only those with capital to spare can afford to take advantage of the feed-in tariffs regime, it is the haves who have benefitted from its introduction. Solar panels have appeared in the middle-class villages and suburbs, not the housing estates of the poor. The have-nots are left with the fallout – higher bills for fuel and everything else – and forced to watch the landowners and newly minted renewables millionaires become ever wealthier at their expense, products of the 'orgy of rent-seeking'[73] that has been launched by the political classes.[74]

# 5 Conclusions

The UK government's policies are predicated on their being an ethical way – indeed the only ethical way – of tackling the hypothetical problem of global warming. How do these ethics square with the damage being done?

As this review of some of these policies has demonstrated, the market-fixing approach adopted has had many consequences that one hopes none of its architects intended. As rainforests are cleared to make way for biofuels, their inhabitants evicted from their ancestral lands, as land is diverted from food to energy production, as hunger grips the poorest and most vulnerable people of the world, as havoc is wrought on the countryside and its wildlife, as money is handed to big business, as the old and less well-off worry about their ability to pay their energy bills, those whose work has been behind the change in approach to climate change must surely have pause for thought. Was this destruction and poisoning of the natural world, this trampling of human rights the legacy they want to leave the world? Is this really the only ethical way to deal with the question of global warming? Is it even ethical at all?

As we saw at the start of this report, there are other approaches to inter-generational equity that would lead to profoundly different policy responses, responses that would avoid the damage being visited upon the poor of the world and improving the lives of everyone. With all the unintended consequences of government policy on view, and with new, lower estimates of the likely extent of global warming now appearing every year,[75,76] the time is ripe for a reassessment. A public debate on the damage being done by climate change policy is long overdue.

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