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Special report

A special report on climate change and the carbon economy

Getting warmer

Dec 3rd 2009
From *The Economist* print edition

So far the effort to tackle global warming has achieved little. Copenhagen offers the chance to do better, says Emma Duncan (interviewed here)

Illustration by M. Morgenstern



THE mountain bark beetle is a familiar pest in the forests of British Columbia. Its population rises and falls unpredictably, destroying clumps of pinewood as it peaks which then regenerate as the bug recedes. But Scott Green, who studies forest ecology at the University of Northern British Columbia, says the current outbreak is "unprecedented in recorded history: a natural background-noise disturbance has become a major outbreak. We're looking at the loss of 80% of our pine forest cover." Other parts of North America have also been affected, but the damage in British Columbia is particularly severe, and particularly troubling in a province whose economy is dominated by timber.

Three main explanations for this disastrous outbreak suggest themselves. It could be chance. Populations do fluctuate dramatically and unexpectedly. It could be the result of management practices. British Columbia's woodland is less varied than it used to be, which helps a beetle that prefers pine. Or it could be caused by the higher temperatures that now prevail in northern areas, allowing beetles to breed more often in summer and survive in greater numbers through the winter.

The Framework Convention on Climate Change (UNFCCC), which the United Nations adopted at the Earth Summit in Rio de Janeiro, is now 17 years old. Its aim was "to achieve stabilisation of greenhouse-gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The Kyoto protocol, which set about realising those aims, was signed in 1997 and came into force in 2005. Its first commitment period runs out in 2012, and implementing a new one is expected to take at least three years, which is why the 15th conference of the parties to the UNFCCC that starts in Copenhagen on December 7th is such a big deal. Without a new global agreement, there is not much chance of averting serious climate change.

Since the UNFCCC was signed, much has changed, though more in the biosphere than the human sphere. According to the Intergovernmental Panel on Climate Change (IPCC), the body set up to establish a scientific consensus on what is happening, heat waves, droughts, floods and serious hurricanes have increased in frequency over the past few decades; it reckons those trends are all likely or very likely to have been

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THE FOLIO SOCIETY

caused by human activity and will probably continue. Temperatures by the end of the century might be up by anything from 1.1°C to 6.4°C.

In most of the world the climate changes to date are barely perceptible or hard to pin on warming. In British Columbia and farther north the effects of climate change are clearer. Air temperatures in the Arctic are rising about twice as fast as in the rest of the world. The summer sea ice is thinning and shrinking. The past three years have seen the biggest losses since proper record-keeping started in 1979. Ten years ago scientists reckoned that summer sea-ice would be gone by the end of this century. Now they expect it to disappear within a decade or so.

Since sea-ice is already in the water, its melting has little effect on sea levels. Those are determined by temperature (warmer water takes up more room) and the size of the Greenland and Antarctic ice caps. The glaciers in south-eastern Greenland have picked up speed. Jakobshavn Isbrae, the largest of them, which drains 6% of Greenland's ice, is now moving at 12km a year—twice as fast as it was when the UNFCCC was signed—and its "calving front", where it breaks down into icebergs, has retreated by 20km in six years. That is part of the reason why the sea level is now rising at 3-3.5mm a year, twice the average annual rate in the 20th century.

As with the mountain bark beetle, it is not entirely clear why this is happening. The glaciers could be retreating because of one of the countless natural oscillations in the climate that scientists do not properly understand. If so, the glacial retreat could well stop, as it did in the middle of the 20th century after a 100-year retreat. But the usual causes of natural variability do not seem to explain the current trend, so scientists incline to the view that it is man-made. It is therefore likely to persist unless mankind starts to behave differently—and there is not much sign of that happening.

Carbon-dioxide emissions are now 30% higher than they were when the UNFCCC was signed 17 years ago. Atmospheric concentrations of CO₂ equivalent (carbon dioxide and other greenhouse gases) reached 430 parts per million last year, compared with 280ppm before the industrial revolution. At the current rate of increase they could more than treble by the end of the century, which would mean a 50% risk of a global temperature increase of 5°C. To put that in context, the current average global temperature is only 5°C warmer than the last ice age. Such a rise would probably lead to fast-melting ice sheets, rising sea levels, drought, disease and collapsing agriculture in poor countries, and mass migration. But nobody really knows, and nobody wants to know.

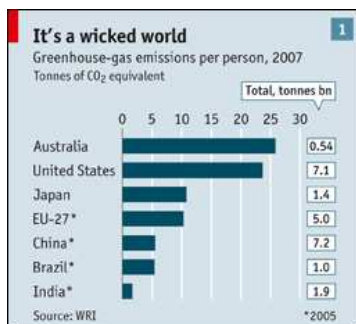
Some scientists think that the planet is already on an irreversible journey to dangerous warming. A few climate-change sceptics think the problem will right itself. Either may be correct. Predictions about a mechanism as complex as the climate cannot be made with any certainty. But the broad scientific consensus is that serious climate change is a danger, and this newspaper believes that, as an insurance policy against a catastrophe that may never happen, the world needs to adjust its behaviour to try to avert that threat.

The problem is not a technological one. The human race has almost all the tools it needs to continue leading much the sort of life it has been enjoying without causing a net increase in greenhouse-gas concentrations in the atmosphere. Industrial and agricultural processes can be changed. Electricity can be produced by wind, sunlight, biomass or nuclear reactors, and cars can be powered by biofuels and electricity. Biofuel engines for aircraft still need some work before they are suitable for long-haul flights, but should be available soon.

Nor is it a question of economics. Economists argue over the sums (see [article](#)), but broadly agree that greenhouse-gas emissions can be curbed without flattening the world economy.

A hard sell

It is all about politics. Climate change is the hardest political problem the world has ever had to deal with. It is a prisoner's dilemma, a free-rider problem and the tragedy of the commons all rolled into one. At issue is the difficulty of allocating the cost of collective action and trusting other parties to bear their share of the burden. At a city, state and national level, institutions that can resolve such problems have been built up over the centuries. But climate change has been a worldwide worry for only a couple of decades. Mankind has no framework for it. The UN is a useful talking shop, but it does not get much done.



The closest parallel is the world trading system. This has many achievements to its name, but it is not an encouraging model. Not only is the latest round of negotiations mired in difficulty, but the World Trade Organisation's task is child's play compared with climate change. The benefits of concluding trade deals are certain and accrue in the short term. The benefits of mitigating climate change are uncertain, since scientists are unsure of the scale and consequences of global warming, and will mostly accrue many years hence. The need for action, by contrast, is urgent.

The problem will be solved only if the world economy moves from carbon-intensive to low-carbon—and, in the long term, to zero-carbon—products and processes. That requires businesses to change their investment patterns. And they will do so only if governments give them clear, consistent signals. This special report will argue that so far this has not happened. The policies adopted to avoid dangerous climate change have been partly misconceived and largely inadequate. They have sent too many wrong signals and not enough of the right ones.

That is partly because of the way the Kyoto protocol was designed. By trying to include all the greenhouse gases in a single agreement, it has been less successful than the less ambitious Montreal protocol, which cut ozone-depleting gases fast and cheaply. By including too many countries in detailed negotiations, it has reduced the

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chances of agreement. And by dividing countries, it has deepened a rift that is international agreement has fallen victim to bear the cost of their elected leaders' as brave enough to push them.

Copenhagen represents a second chance high, but so are the hurdles. The gap between questions—emissions levels and money pass climate-change legislation means it reached at the conference. The talk is of Mexico City in a year.

To suggest that much has gone wrong in people who have dedicated two decades to the threshold of a global agreement is only if the domestic policies through which it is implemented are both efficient and effective. If they are ineffective, nothing will change. If they are inefficient, they will waste money. And if taxpayers decide that green policies are packed with pork, they will turn against them.

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