



Earth's physical resources: fossil fuels

The Future of Energy

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The big issue for the 21st century isn't just the availability of fossil fuel reserves, it's also the impact that burning these fuels is having on the global environment. All fossil fuels produce carbon dioxide when they're burned and carbon dioxide is one of the so-called greenhouse gases that are being blamed for climate change and global warming.

Geoff Jenkins, Meteorologist, Hadley Centre:

We've seen a rise in global temperatures of .6 or .7 of a degree over the last hundred years or so, particularly in the last 30 or 40 years. Now, this could be due to natural factors such as increasing the amount of energy from the sun, natural variability in the earth's climate system. But increasingly we believe that most of the change that we've seen particularly over the last 50 years has been due to human activities and in particular due changes in the amount of carbon dioxide emitted by power stations and cars and so on which change the amount of carbon dioxide in the air and traps more heat in the climate system and causes temperatures to rise. We think that's been a large part of the rising temperatures over the last 50 years.

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The rise in the earth's temperature may result in the thermal expansion of the ocean's and rising sea levels so more flooding is seen as one consequence of global warming.

Geoff Jenkins, Meteorologist, Hadley Centre:

Even in the past 100, 200 to a 1000 years, we've always seen flooding of some sort just simply due to natural factors. So what we're trying to do is to look at how much additional flooding or how much additional sea level rise there has been and how much there will be in the future compared to that which would arise naturally. It's very easy to jump on every flood that we see, every flooding event and say that must be global warming. In most cases it's probably not. It's probably natural, but what we would expect to see is a gradual increase in the number of these events over the next hundred years or so.

Mike Hulme, Director, Tyndall Centre for Climate Change:

We've also seen changes in the distribution of rainfall so that a larger proportion now of our rainfall occurs in the winter half of the year, rather less of it, actually, now falls in summer. And also importantly, of that winter rainfall that has been increasing, a bigger proportion of that rainfall has been occurring on the heavy rainfall days, the days when we have particularly intense rain storms. So that clearly has had implications for flood risk and flood management in the United Kingdom.

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Most scientists now believe that there's clear evidence of global warming. The link between temperature rise and the burning of fossil fuels is less clear cut. Even so there's increasing public and political pressure to reduce the long-term environmental impact of the combustion of fossil fuels.

Geoff Jenkins, Meteorologist, Hadley Centre:

If there are no steps taken to reduce greenhouse gas emissions below what we might call the business-as-usual scenarios, then we would predict temperature rises globally between something like two degrees and six degrees. And we would predict major changes in both increases in rainfall and decreases in rainfall particularly in equatorial regions. We would predict a sea level rise, again with great uncertainty, but a mid-level estimate for that of about a half a metre, again over the next hundred years or so.

Mark Moody-Stuart, former Chairman, Shell Oil:

And I believe that what we will see is just as we saw, the replacement of wood and coal, by liquid fuels and then by gas, so we will see the incoming of renewables, of hydrogen which will progressively replace hydrocarbons. [engine noises]

Colin Campbell, petro-geologist:

If the government says it should use gas while it builds up renewables and introduces intelligent new energy saving policies, well, that's absolutely the best thing to do, sure. The worst thing to do would be to say, yes, we can go on using gas for ever and a day and don't bother with the renewables and don't bother with changing our wasteful ways.

Mike Hulme, Director, Tyndall Centre for Climate Change:

Clearly, it's within our power to shift our energy systems away from fossil-based sources into less polluting forms of energy and if we do that then the concentration of these gases will eventually stabilise. It will take several decades to, to do that, but eventually they'll stabilise and will therefore, slow the rate at which the world is warming up. So it really comes down in the end to choices about energy: whether we want to continue with these polluting forms of energy from fossil sources, or whether we can ensure this transformation to a new energy system that is much, much less polluting.