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## Climate target is not radical enough - study

Nasa scientist warns the world must urgently make huge CO<sub>2</sub> reductions

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**Ed Pilkington** in New York

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One of the world's leading climate scientists warns today that the EU and its international partners must urgently rethink targets for cutting carbon dioxide in the atmosphere because of fears they have grossly underestimated the scale of the problem.

In a startling reappraisal of the threat, James Hansen, head of the Nasa Goddard Institute for Space Studies in New York, calls for a sharp reduction in CO<sub>2</sub> limits.

Hansen says the EU target of 550 parts per million of CO<sub>2</sub> - the most stringent in the world - should be slashed to 350ppm. He argues the cut is needed if "humanity wishes to preserve a planet similar to that on which civilisation developed". A final version of the paper Hansen co-authored with eight other climate scientists, is posted today on the Archive website. Instead of using theoretical models to estimate the sensitivity of the climate, his team turned to evidence from the Earth's history, which they say gives a much more accurate picture.

The team studied core samples taken from the bottom of the ocean, which allow CO<sub>2</sub> levels to be tracked millions of years ago. They show that when the world began to glacialise at the start of the Ice age about 35m years ago, the concentration of CO<sub>2</sub> in the atmosphere stood at about 450ppm.

"If you leave us at 450ppm for long enough it will probably melt all the ice - that's a sea rise of 75 metres. What we have found is that the target we have all been aiming for is a disaster - a guaranteed disaster," Hansen told the Guardian.

At levels as high as 550ppm, the world would warm by 6C, the paper finds. Previous estimates had suggested warming would be just 3C at that point.

Hansen has long been a prominent figure in climate change science. He was one of the first to bring the crisis to the world's attention in testimony to Congress in the 1980s.

But his relationship with the Bush administration has been frosty. In 2005 he accused the White House and Nasa of trying to censor him. He has steadily revised his analysis of the scale of the global warming and was himself one of the architects of a 450ppm target. But he told the Guardian: "I realise that was too high."

The fundamental reason for his reassessment was what he calls "slow feedback" mechanisms which are only now becoming fully understood. They amplify the rise in temperature caused by increasing the concentration of greenhouse gases. Ice and snow reflect sunlight but when they melt, they leave exposed ground which absorbs more heat.

As ice sheets recede, the warming effect is compounded. Satellite technology available over the past three years has shown that the ice sheets are melting much faster than expected, with Greenland and west Antarctica both losing mass.

Hansen said that he now regards as "implausible" the view of many climate scientists that the shrinking of the ice sheets would take thousands of years. "If we follow business as usual I can't see how west Antarctica could survive a century. We are talking about a sea-level rise of at least a couple of metres this century."

The revised target is likely to prompt criticism that he is setting the bar unrealistically high. With the US administration still acting as a drag on international efforts, climate campaigners are struggling even to get a 450ppm target to stick.

Hansen said his findings were not a recipe for despair. The good news, he said, is that reserves of fossil fuels have been exaggerated, so an alternative source of energy will have to be rapidly put in place in any case. Other measures could include a moratorium on coal power stations which would bring the CO<sub>2</sub> levels to below 400ppm.

Hansen's revised position will pile yet further pressure on Britain over plans to build a new generation of coal power stations. Last year he wrote to Gordon Brown urging him to block the first such power station; the Royal Society has made similar suggestions to the government.

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