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Our ref: 01-10-2009-112121-001

26 October 2009

Dear Mr Dawson,

Re: Environmental Information Regulations enquiry

Your email dated 29 September 2009 has been considered to be a request for information in accordance with the Environmental Information Regulations Act 2004.

You asked for information relating to our climate prediction paper 'four degrees'.

The Met Office did present a paper at a conference which demonstrated that global temperatures may rise by four degrees Celsius relative to pre-industrial, if greenhouse gas emissions continue at high rates.

The Met Office holds the information and I will answer your questions one by one.

1. How many times was the computer model run?

We ran a total of 796 simulations with our own models specifically for this study, and also analysed further simulations with models from the IPCC 4th Assessment Report. So a total of 836 simulations were included in this study. This included both full general circulation models and simple climate models.

2. What other results were obtained?

These models projected a range of levels of global warming by the 2090s. Relative to the pre-industrial climate, the lowest level of projected warming was 1.9°C by the 2090s, and the highest was 13.2°C. This range is due to differences in the scenario of greenhouse gas emissions and differences in the sensitivity of the climate system to a given emissions scenario – we use multiple models in order to explore this wide range of possibilities.

The extreme projections (in either direction) are excluded as they have a low frequency of occurrence (it is estimated that the 13.2°C warming by 2090 to occur less than 0.0002% of time in the 836 simulations.).

Under the high emissions scenario, most simulations projected warming by 4°C or more by 2090. Lower emissions scenarios result in a lower frequency of exceeding 4°C warming, suggesting that reducing emissions of greenhouse gases could avoid this level of global warming.

These results are all consistent with work previously published by the Intergovernmental Panel on Climate Change (IPCC 2007), following a very extensive open peer review process.

3. Did any of the models predict no warming or predict cooling?

No, not in the Pre-Industrial to 2100 temperature change (see response to Question 2). However for the models which represent internal variability, the models capture periods where the climate warms faster or slower than the longer term trends. These models all represent individual periods which cool, which can last up to a decade or more.

4. Was the result that was published the most extreme result obtained?

No, please see the response to Q2

I hope this answers your enquiry.

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Yours sincerely,

FOI Manager