

# Climate Change

## A brief outline of the strength of the scientific consensus

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In 2004, the science historian, Dr Naomi Oreskes, published an article in *Science* (this and *Nature* are the top two scientific journals in the world and their standards are therefore extremely demanding). She wrote that, "*Politicians, economists, journalists and others may have the impression of confusion, disagreement or discord among climate scientists, but that impression is incorrect*".

That mistaken impression is fuelled by the media: one survey found that over 50% of articles in the popular media cast strong doubt on the human causation of global warming. In contrast, Dr Oreskes looked at a random sample of 928 *bona fide* ('peer reviewed') scientific articles on the subject, published between 1993 and 2003, and failed to find a single example taking such a position. [Of course, there may be some, since she only looked at 10% of the total, but her study establishes that the consensus was overwhelming.]

### The Intergovernmental Panel on Climate Change (IPCC)

The two main conclusions of Working Group 1 are that the globe is warming rapidly and man-made greenhouse gas emissions are mainly to blame. Note the difference in the respective levels of confidence.

- "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (IPCC WG1, 2007, p5).
- "Most of the observed increase in globally averaged temperatures since the mid-20<sup>th</sup> century is *very likely* [ie, > 90%] due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC WG1, 2007, p10). [This compares with the conclusion in the 2001 report, that it is "*likely*" that human causation is responsible.]

The IPCC was set up under the authority of a UN convention, signed by all the world's governments, under whose supervision it ultimately works. It is headed up by the world's top climate scientists from every country and its work must surely represent the greatest international, collaborative endeavour in the history of science. The award of the Nobel Peace Prize in 2007 could not have been more richly deserved.

It has produced four reports, in 1990, 1995, 2001 and 2007. The latest was in three parts, and just Part I, the physical science, ran to 1,000 pages, being based entirely on peer-reviewed scientific articles - tens of thousands of them. "*No other scientific topic has been so thoroughly researched and reviewed*" (Professor Sir John Houghton CBE FRS).

The IPCC's reports have to be signed off, line by line, by all the world's governments (including the US). The idea that a significant body of active, leading, reputable climate scientists disagree with its core findings is just nonsense – don't you think they would get together and publish a minority report and don't you think our dear friend, George W., would have just leapt on that?!

As Mr Justice Burton concluded, in the case brought before the High Court to prevent the dissemination in schools of Al Gore's film, 'An Inconvenient Truth' "*The central scientific theme of the film [ie, climate change and its anthropogenic causation] is now accepted by the overwhelming majority of the world's scientific community. That consensus is reflected in the recent report of the IPCC. The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the... the scientific basis of human-induced climate change... Hundreds of experts from all over the world contribute to the preparation of IPCC reports.*"

### The National Scientific Academies

On 7th June 2005, the Royal Society (the oldest national academy of science in the world), and the National Academy of Sciences of the USA (by far the most prestigious academy), and the national academies of science of all the other G8 countries, and those of China, India and Brazil, put out a joint statement on the reality and causation of global warming – such a joint statement is without precedent in the history of science.

It stated that, "*There is now strong evidence that significant global warming is occurring*" and continued: "*It is likely that most of the recent warming... can be attributed to human activities.*" "*The scientific understanding of climate change is now sufficiently clear... It is vital that all nations... contribute to substantial reduction in global greenhouse gas emissions.*" "*We urge all nations... to take prompt action to reduce the causes of climate change...*"

It is unthinkable that the Presidents would have put their names to the statement, and put the prestige of their academies behind it, had it not been supported by all, or almost all, their most able climate scientists.

### American Geophysical Union

This is interesting, not only on account of the size of the AGU, the largest society of earth and space scientists in the world with 50,000 members in 137 countries, but because of the development of its position since 2003. At that time it acknowledged the strength of evidence for anthropogenic climate change, but called for a concerted worldwide study to work out what the effects would be.

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By January 2008, it has revised its position as a result of a study by “a panel of experts, who created drafts which underwent extensive critical review, before it was formally approved by its elected Council in December”. “Rather than the AGU saying that this is important and should be looked at, this is a call that we need to do something about it” (Professor Tim Killeen, AGU President). With “fewer caveats” than previously, it states that the world’s climate is “clearly out of balance and is warming”, that these changes are “not natural”, and that CO2 emissions need to be drastically reduced.

### No laughing matter

At the public event I organised, I put up the following statement on the screen:

*“There is widespread agreement on certain basics, and one of the most important is that we are producing far more CO2 from fossil fuels than we ought to be. The carbon dioxide just accumulates in the atmosphere and there’s no end point, it just gets hotter and hotter, and so at some point [the earth] becomes unliveable.”* (Sept 2007)

I then projected the following names and asked who the audience thought was most likely to have said it: the Director of Greenpeace, the Development Coordinator of Make Poverty History NE (that’s me), or Professor John Marburger, President Bush’s chief science advisor and the Director of the [US] Office of Science and Technology Policy. [I’m sure you’ve guessed by now!]

However, as “the earth becomes unliveable [uninhabitable]” comment indicates, this is no laughing matter, but desperately serious:

- “Never before have we faced such a global threat. The longer we prevaricate, the more difficult the task becomes” (Lord Robert May, then President of the Royal Society, 2005).
- “We have just a small window of opportunity and it is closing rapidly. There is not a moment to lose... We are risking the ability of the human race to survive” (Dr Rajendra Pachauri, Chair of the IPCC, 2005).
- “We are getting almost to the point of irreversible meltdown, and will pass it soon if we are not careful” (Sir John Houghton, Former Co-Chair of the IPCC, 2006).
- “The Earth today stands in imminent peril... ..and nothing short of a planetary rescue will save it from the environmental cataclysm” (Prof James Hansen, NASA’s Chief Climate Scientist, 2007).

### Conclusion

To a non-scientist, it may sound as if I’m saying that these things are certain, whereas nothing is ever really certain in science! There’s always another explanation, however vanishingly small its likelihood. For example, a former South African Minister of Health thought AIDS could be cured with garlic and beetroot – it’s all a conspiracy of the Western drug companies. That is ‘conceivable’, although I wouldn’t put any money on it myself!

As far as the reality of rapid warming is concerned, the IPCC says this is “unequivocal” – ie, in legal language, beyond reasonable doubt. As far as its anthropogenic causation is concerned, they have a “high level of confidence” (they say they’re at least 90% sure) and consider any alternative to be highly unlikely.

Suppose the steering on your car felt a bit dodgy. You take it to a good garage and the chief mechanic tells you “It’s a death trap. Drive it at speed and it will fail completely”. Unconvinced, you consult another 18 mechanics and they all say the same. You ask them, “Are you absolutely sure you’re right, with no doubt whatever?” They’d probably baulk at that, but say they were pretty confident - at least 90% sure - of their opinion. But the twentieth one tells you he thinks it will probably be OK. What would you do? Load your family into the car and roar off down the motorway? I hope not.

But we’re dealing with the future of the entire human race. If we take the advice of the best science currently available, and it turns out to have been ‘sincerely wrong’, we will have gone to a lot of trouble and expense for nothing, but behaved honourably in the circumstances. But if we don’t take their advice, and they’re right (and they almost certainly are right), the result will be “a catastrophe that will exacerbate human suffering to a magnitude that perhaps the world has not yet seen” (Desmond Tutu), and we will have been guilty of wicked folly – wilfully perpetrating an evil – a crime against humanity - surpassing all others.

My attitude is simple: I’ll have no readily avoidable part in it, nor will it happen with my meek acquiescence. For me, that’s very inconvenient!

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