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IPCC Humans blamed for climate change

By Richard Black

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IPCC chairman Rajendra Pachauri (Image: AP)

The options for mitigating greenhouse gas emissions appear in a different light, because you can see what the costs of inaction are

Dr Rajendra Pachauri,
IPCC chairman

Analysis: 'So what's new?'

IPCC report: At a glance

Global climate change is "very likely" to have a human cause, an influential group of scientists has concluded.

The Intergovernmental Panel on Climate Change (IPCC) said temperatures were probably going to increase by 1.8-4C (3.2-7.2F) by the end of the century.

It also projected that sea levels were most likely to rise by 28-43cm, and global warming was likely to influence the intensity of tropical storms.

The findings are the first of four IPCC reports to be published this year.

"We can be very confident that the net effect of human activity since 1750 has been one of warming," co-lead author Dr Susan Solomon told delegates in Paris.

Strong language

The report, produced by a team tasked with assessing the science of climate change, was intended to be the definitive summary of climatic shifts facing the world in the coming years.

IPCC PROJECTIONS

Probable temperature rise between 1.8C and 4C

Possible temperature rise between 1.1C and 6.4C

Sea level most likely to rise by 28-43cm

Arctic summer sea ice disappears in second half of century

Increase in heatwaves very likely

Increase in tropical storm intensity likely

IPCC report: World reaction

IPCC report: UK reaction

The agency said that it would use stronger language to assess humanity's influence on climatic change than it had previously done.

In 2001, it said that it was "likely" that human activities lay behind the trends observed at various parts of the planet; "likely" in IPCC terminology means between 66% and 90% probability.

Now, the panel concluded that it was at least 90% certain that human emissions of greenhouse gases rather than natural variations are warming the planet's surface.

They projected that temperatures would probably rise by between 1.8C and 4C, though increases as small as 1.1C (2F) or as large as 6.4C (11.5F) were possible.

In 2001, using different methodology, the numbers were 1.4 (2.5F) and 5.8C (10.4F).

Climate schematic (BBC)

How computers model climate

On sea level, there has been a more fundamental debate.

Computer models of climate generally include water coming into the oceans as ice caps and glaciers melt. But the potentially much larger contribution of "accelerated melting", where the disintegration of ice shelves and lubrication of glaciers by meltwater speeds up the flow of ice into the oceans, is much harder to model.

So the IPCC had to decide whether to exclude this from its calculations, or to estimate the effect of a process which scientists do not understand well but which could have a big impact.

They used the former, more conservative approach, projecting an average rise in sea levels globally of between 28 and 43cm. The 2001 report cited a range of nine to 88cm.

As for climate change influencing the intensity of tropical storms in some areas of the world, the IPCC concluded that it was likely - meaning a greater probability than 66% - that rising temperatures were a factor.

'Unequivocal'

Heat map

Climate change: In graphics

Dr Rajendra Pachauri, the IPCC chairman, said: "It is extremely encouraging in that the science has moved on from what was possible in the Third Assessment Report.

"If you see the extent to which human activities are influencing the climate system, the options for mitigating greenhouse gas emissions appear in a different light,

because you can see what the costs of inaction are," he told delegates in Paris.

Achim Steiner, executive director of the United Nations Environment Programme (Unep), said the findings marked a historical landmark in the debate about whether humans were affecting the state of the atmosphere.

READ THE FINDINGS

IPCC Summary [2.2MB]

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"It is an unequivocal series of evidence [showing that] fossil fuel burning and land use change are affecting the climate on our planet."

He added: "If you are an African child born in 2007, by the time you are 50 years old you may be faced with disease and new levels of drought."

He said that he hoped the IPCC report would galvanise national governments into action.

At variance

But a study published on the eve of the IPCC report suggested that the international body's previous reports may have actually been too conservative.

HAVE YOUR SAY

Another day, another climate-change story. All of this leads to a deaf audience
Andy, MI, USA

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Writing in the journal *Science*, an international group of scientists concluded that temperatures and sea levels had been rising at or above the maximum rates proposed in the last report, which was published in 2001.

The paper compared the 2001 projections on temperature and sea level change report with what has actually happened.

The models had forecasted a temperature rise between about 0.15C-0.35C (0.27-0.63F) over this period. The actual rise of 0.33C (0.59F) was very close to the top of the IPCC's range.

A more dramatic picture emerged from the sea level comparison. The actual average level, measured by tide gauges and satellites, had risen faster than the intergovernmental panel of scientists predicted it would.

The IPCC's full climate science report will be released later in the year, as will other

chapters looking at the probable impacts of climate change, options for adapting to those impacts, and possible routes to reducing emissions of greenhouse gases.

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