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Twenty-year hiatus in rising temperatures has climate scientists puzzled

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The fact that global surface temperatures have not followed the expected global warming pattern is now widely accepted. Picture: Ray Strange Source: The Australian

DEBATE about the reality of a two-decade pause in global warming and what it means has made its way from the sceptical fringe to the mainstream.

In a lengthy article this week, The Economist magazine said if climate scientists were credit-rating agencies, then climate sensitivity - the way climate reacts to changes in carbon-dioxide levels - would be on negative watch but not yet downgraded.

Another paper published by leading climate scientist James Hansen, the head of NASA's Goddard Institute for Space Studies, says the lower than expected temperature rise between 2000 and the present could be explained by increased emissions from burning coal.

For Hansen the pause is a fact, but it's good news that probably won't last.

International Panel on Climate Change chairman Rajendra Pachauri recently told The Weekend Australian the hiatus would have to last 30 to 40 years "at least" to break the long-term warming trend.

But the fact that global surface temperatures have not followed the expected global warming pattern is now widely accepted.

Research by Ed Hawkins of University of Reading shows surface temperatures since 2005 are already at the low end of the range projections derived from 20 climate models and if they remain flat, they will fall outside the models' range within a few years.

"The global temperature standstill shows that climate models are diverging from observations," says David Whitehouse of the Global Warming Policy Foundation.

"If we have not passed it already, we are on the threshold of global observations becoming incompatible with the consensus theory of climate change," he says.

Whitehouse argues that whatever has happened to make temperatures remain constant requires an explanation because the pause in temperature rise has occurred despite a sharp increase in global carbon emissions.

The Economist says the world has added roughly 100 billion tonnes of carbon to the atmosphere between 2000 and 2010, about one-quarter of all the carbon dioxide put there by humans since 1750. This mismatch between rising greenhouse gas emissions and not-rising temperatures is among the biggest puzzles in climate science just now, The Economist article says.

"But it does not mean global warming is a delusion."

The fact is temperatures between 2000 and 2010 are still almost 1C above their level in the first decade of the 20th century.

"The mismatch might mean that for some unexplained reason there has been a temporary lag between more carbon dioxide and higher temperatures in 2000-2010.

"Or it might mean that the 1990s, when temperatures were rising fast, was the anomalous period."

The magazine explores a range of possible explanations including higher emissions of sulphur dioxide, the little understood impact of clouds and the circulation of heat into the deep ocean.

But it also points to an increasing body of research that suggests it may be that climate is responding to higher concentrations of atmospheric carbon dioxide in ways that had not been properly understood before.

"This possibility, if true, could have profound significance both for climate science and for environmental and social policy," the article says.

There are now a number of studies that predict future temperature rises as a result of man-made carbon dioxide emissions at well below the IPCC best estimate of about 3C over the century.

The upcoming IPCC report is expected to lift the maximum possible temperature increase to 6C.

The Research Council of Norway says in a non-peer-reviewed paper that the best estimate concludes there is a 90 per cent probability that doubling CO2 emissions will increase temperatures by only 1.2C to 2.9C, the most likely figure being 1.9C.

Another study based on the way the climate behaved about 20,000 years ago has given a best guess of 2.3C.

Other forecasts, accepted for publication, have reanalysed work cited by the IPCC but taken account of more recent temperature data and given a figure of between 1C and 3C.

The Economist says understanding which estimate is true is vital to getting the best response.

"If as conventional wisdom has it, global temperatures could rise by 3C or more in response to a doubling of emissions, then the correct response would be the one to which most of the world pays lip service; rein in the warming and the greenhouse gases causing it," the article says.

"If, however, temperatures are likely to rise by only 2 degrees Celsius in response to a doubling of carbon emissions (and if the likelihood of a 6 degrees Celsius is trivial) the calculation might change," it says.

"Perhaps the world should seek to adjust to (rather than stop) the greenhouse-gas splurge.

"There is no point buying earthquake insurance if you don't live in an earthquake zone."

According to The Economist, "given the hiatus in warming and all the new evidence, a small reduction in estimates of climate sensitivity would seem to be justified." On face value, Hansen agrees the slowdown in global temperature rises can be seen as "good news".

But he is not ready to recalculate the Faustian bargain that weighs the future cost to humanity of continued carbon dioxide emissions.

Hansen argues that the impact of human carbon dioxide emissions has been masked by the sharp increase in coal use, primarily in China and India.

Increased particulate and nitrogen pollution has worked in the opposite direction of rising carbon dioxide levels in the atmosphere.

Another paper published in Geophysical Research Letters on research from the University of Colorado Boulder found small volcanoes, not more coal power stations in China, were responsible for the slowdown in global warming.

But this did not mean that climate change was not a problem.

"Emissions from volcanic gases go up and down, helping to cool or heat the planet, while greenhouse gases from human activity just continue to go up," author Ryan Neely says.

Hansen's bottom line is that increased short-term masking of greenhouse gas warming by fossil fuel particulate and nitrogen pollution represents a "doubling down" of the Faustian bargain, an increase in the stakes.

"The more we allow the Faustian debt to build, the more unmanageable the eventual consequences will be," he says.