Paris Climate Agreement targets challenged

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New research into the targets set out in the Paris Climate Agreement challenges conventional wisdom on the way that global warming and climate change should be tackled in the long term.

Under the United Nations Framework Convention on Climate Change (UNFCCC), the 2015 'Paris Agreement' on climate change sets out temperature targets that signatories of the Agreement should strive to achieve, by cutting carbon dioxide and other greenhouse gas emissions. Carbon dioxide is believed to be the primary cause of rising temperatures and climate change.

Australia is one of the 196 signatories to the Agreement.

The Agreement recommends that the Earth's average temperature should be reduced to a level not much above what it was before the world industrialised. The target is for temperatures to return to either "well below" 2°C above the pre-industrial level, or, if possible, only 1.5°C above global temperatures in the era before carbon dioxide emissions increased dramatically.

The paper, published online in the journal *Climatic Change*, challenges current thinking on how to meet the targets that seek to avoid the consequences of climate change, such as rising sea levels.

"Present research focuses on the effect that cutting carbon dioxide and other greenhouse gas emissions will have on global temperatures," says research author Adjunct Professor Tom Wigley from the University of

Adelaide's Environment Institute.

"A new approach to the emissions vs temperature conundrum is required. My research turns the equation on its head and reverses the analysis to start with a temperature target and determine what emissions are required to meet this target.

"The results are surprising as they show that, although drastic cuts to carbon dioxide emissions are required, they may be less than the current belief that they must be reduced to zero, or even to negative levels before 2100, provided some flexibility is allowed in the pathway to the eventual target," he says.

"If this new approach, that analyses how possible future temperature changes affect the atmosphere, is adopted, then unpopular and possibly unachievable reductions in carbon dioxide may not be required to meet the Agreement's eventual targets. In the short-term, however, the cuts required are still large and rapid.

"When faced with unpopular methods of reducing emissions such as nuclear power, and concentrating on intermittent renewable energy sources such as wind and solar, signatories may find that their proposed cuts to emissions are unachievable. The problem is so large that no form of carbon-free energy can be ignored.

"Furthermore, even if signatories to the Agreement manage to meet the Agreement's targets they will still not be sufficient to avoid the predicted risks associated with rising sea levels," Professor Wigley says.

"In order to effectively tackle one of society's greatest challenges, robust analysis such as this, that challenges conventional 'wisdom', must be considered before local solutions can effectively contribute to long-term global targets."

Provided by University of Adelaide