

Policy makers should not discount the damages from future climate tipping points

March 23 2015



A composite image of the Western hemisphere of the Earth. Credit: NASA

Society should set a high carbon tax now to try and prevent climate change reaching a point of no return according to a new study.

The research, carried out by the Universities of Exeter, Zurich, Stanford and Chicago and published today in the journal *Nature Climate Change* shows that the prospect of an [uncertain future](#) tipping point should greatly increase the amount we are willing to pay now to limit [climate change](#). Depending on the [economic impacts](#) of an [abrupt change](#) in climate and how quickly this is felt, the cost of [carbon](#) emitted now increases by 50 - 200%. Setting a correspondingly high carbon tax would trigger a reduction in [carbon emissions](#) that delays the tipping point.

The researchers developed a model to investigate how the uncertainty surrounding [tipping points](#) should influence climate policy. Based on expert input, the likelihood that human activities will push the climate system past a tipping point increases from 2.5% in 2050 to nearly 50% in 2200 in their baseline scenario.

Professor Tim Lenton from the University of Exeter said: "Our results support recent suggestions that the costs of carbon emissions used to inform policy are being underestimated.

"We are calling on policy makers to respond to the prospect of triggering future climate tipping points by applying the brakes now and putting a high price on carbon emissions before it is too late.

"The additional [carbon tax](#) that our model recommends can be thought of as an insurance premium levied on society to delay irreversible damages in the future."

Most methods that weigh up the costs and benefits of tackling climate change ignore climate tipping points and especially the uncertainty surrounding them. Instead they assume that future damages from climate

change are known perfectly and can therefore be discounted at a rate comparable to the market interest rate - reducing the willingness to pay now to protect future generations.

In the new model, the prospect of an uncertain tipping point gave a very different result - that we should be more willing to pay now to reduce the likelihood of a future tipping point and should discount its damages at a very low rate - even if they are most likely to occur far in the future.

This is the first quantitative model to demonstrate that low discounting of climate damages can emerge from a pure market-based approach - it does not have to be based on moral judgements about sustainability and the wellbeing of future generations - although these are of course important considerations.

The potential [climate](#) tipping points considered in the study were a collapse of the Atlantic meridional overturning circulation; irreversible melt of the Greenland Ice Sheet; collapse of the West Antarctic Ice Sheet; dieback of the Amazon rainforest; or an increase in the amplitude of the El Niño Southern Oscillation.

More information: Stochastic integrated assessment of climate tipping points indicates the need for strict climate policy, *Nature Climate Change*, 2015. [DOI: 10.1038/nclimate2570](https://doi.org/10.1038/nclimate2570)

Provided by University of Exeter

Citation: Policy makers should not discount the damages from future climate tipping points (2015, March 23) retrieved 25 April 2024 from <https://phys.org/news/2015-03-policy-makers-discount-future-climate.html>

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