

Report: Holding global warming to 2C increase still possible if nations act

October 24 2011, by Bob Yirka



Satellite image of ship tracks, clouds created by the exhaust of ship smokestacks.
Image: NASA

(PhysOrg.com) -- A new report published in *Nature Climate Change*, by an international group of scientists, suggests that the goal of holding the average global temperature increase (due mainly to carbon emissions) to 2° C, that the United Nations agreed on at separate meetings in 2009/10, can still be reached, but it's going to take an unprecedented effort by virtually all of the major countries of the world.

The group, comprised of European, Japanese, Chinese and Australian scientists and researchers, and led by Joeri Rogelj, has been studying the published literature comparing current and projected rates of carbon emissions and has correlated those numbers with an expected rise in

global temperatures as a result. They then set up scenarios (using modeling developed by Malte Meinshausen) where they tried to predict likely outcomes (defined as a 66% or better chance) of average global temperatures peaking at or below the 2 degree goal given defined reductions in carbon emissions within certain timeframes. In so doing they found that in order to meet the 2 degree ceiling goal, carbon emissions would have to peak sometime between now and 2020, and then would need to immediately fall thereafter, at least to a median level of 44 Gt (gigatonnes or billion tonnes) of CO₂ equivalent in 2020. And it doesn't stop there, levels would have to continue falling, to around 20 Gt by 2050.

And while the group says it believes reaching these goals is possible, it's clear that drastic action will need to be taken as last year's estimates of carbon emissions was around 48 Gt, and based on the way things are going presently, many experts fear [carbon emissions](#) will increase to 56 Gt by 2020. As part of presenting their findings, the group laid out scenarios that they believe if followed, would result in meeting the 2 degree ceiling. These would generally include replacing carbon emitters (mainly coal) with energy producers that are based on solar photovoltaic, wind and biomass technologies.

Also of concern are increases in regional temperatures, which are uneven due to the Earth being covered mostly in cold water. As the Earth warms up, temperatures over landmasses heat up far more quickly than they do over the oceans, thus, temperatures for some places such as parts of Africa, the Arctic, Canada and Eurasia, which are already seeing spikes, are likely to continue to do so. Some experts warn these areas might see the 2 degree threshold in just ten or twenty years.

The next round of talks is scheduled to begin next month in Durban, South Africa, and some members of the research team are already speaking out, suggesting that unless immediate action is taken, the

opportunity of meeting the 2 degree ceiling could slip away.

More information: Emission pathways consistent with a 2 °C global temperature limit, *Nature Climate Change* (2011)

[doi:10.1038/nclimate1258](https://doi.org/10.1038/nclimate1258)

In recent years, international climate policy has increasingly focused on limiting temperature rise, as opposed to achieving greenhouse-gas-concentration-related objectives. The agreements reached at the United Nations Framework Convention on Climate Change conference in Cancun in 2010 recognize that countries should take urgent action to limit the increase in global average temperature to less than 2 °C relative to pre-industrial levels. If this is to be achieved, policymakers need robust information about the amounts of future greenhouse-gas emissions that are consistent with such temperature limits. This, in turn, requires an understanding of both the technical and economic implications of reducing emissions and the processes that link emissions to temperature. Here we consider both of these aspects by reanalysing a large set of published emission scenarios from integrated assessment models in a risk-based climate modelling framework. We find that in the set of scenarios with a 'likely' (greater than 66%) chance of staying below 2 °C, emissions peak between 2010 and 2020 and fall to a median level of 44 Gt of CO₂ equivalent in 2020 (compared with estimated median emissions across the scenario set of 48 Gt of CO₂ equivalent in 2010). Our analysis confirms that if the mechanisms needed to enable an early peak in global emissions followed by steep reductions are not put in place, there is a significant risk that the 2 °C target will not be achieved.

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