How carbon budgets can change climate negotiations

September 25 2014

Credit: Alfred Palmer/Wikipedia

(Phys.org) —This week in New York, United Nations Secretary General Ban Ki Moon is hosting a Climate Summit. The Summit aims to 'catalyse action' on climate change among the 120 or so Heads of State in attendance. The Summit will build on both the recent report by the

Intergovernmental Panel on Climate Change (IPCC) and a new report on the economics of it all from a commission headed by former Mexican President Felipe Calderón.

To the extent that these reports set the scene for governments and negotiators, the most important recent innovation is the adoption of a 'cumulative emissions' approach to emissions of carbon dioxide. Writing in *Nature Geoscience* this week, we and our Oxford colleague, Myles Allen, argue that though this promises to challenge negotiators in the short term, in the longer term it ought to help them focus on the things that matter most.

Research over the last few years has made it clear that the relationship between cumulative emissions of carbon dioxide and global mean temperature is surprisingly straightforward, and highly policy relevant.

The cumulative approach also makes it clear that for any given temperature target, such as the 2 degrees Celsius target used in United Nations climate change talks, there is a total amount of carbon dioxide that can be burned.

The virtue here is clarity. By finding a simpler way to express the overall scale of the problem, the report gives governments and other players less room to pretend that opportunistic or short-term tweaks to emissions paths are sufficient to meet the goals they have set themselves.

The cumulative approach also puts the principal culprit in the dock: to meet the global goals we have set ourselves we have to reduce emissions of carbon dioxide. Other gases matter to varying extents—a point which is very relevant to New Zealand and other agricultural exporters—but you cannot expect to solve the problem of climate change without eventually halting or capturing emissions of carbon dioxide.

Unsurprisingly, large countries account for a large fraction of emissions: around 10 countries account for 60 percent of emissions. Because we cannot hope to deal with climate change without those emissions shrinking radically, those countries will have to make deep cuts to their emissions, or we will fail to meet the goals agreed by the international community.

This tension will bring pressure onto all major emitters, but especially onto fast-growing economies in the developing world—those which couple huge populations with rapidly rising economic (and hence energy) growth.

Collectively, in the 21st century, these countries' emissions are larger, and hence more important, than the emissions of either the developed world, or of the world's poor countries. The politics of the negotiations, together with a focus on near-term Kyoto-style targets, have obscured this fact.

But when you look at the cumulative emissions numbers it is obvious that the large emerging economies—Brazil, China, India, Indonesia and others—are going to have to make reductions sooner rather than later. This does not let New Zealand or anyone else off the hook. But it's now incontrovertible that the world cannot avoid significant climate change without these countries' early and active participation in climate mitigation initiatives.

By bringing the centrality of cumulative emissions of carbon dioxide more clearly into the picture, the IPCC will put pressure on those countries which will have the most impact on 21st century climate change. That is a welcome new development, and one which might actually matter for the negotiations.

Successful attempts by some governments to fudge this inconvenient

truth in the widely-used summary of the IPCC's report suggest these issues have a long way to run. But by pointing out that over the long run, net carbon dioxide emissions have to go to zero to achieve already agreed climate goals, scientists have reduced the scope for political gamesmanship and deals about irrelevant details. These are good things.

More information: Cumulative emissions and climate policy, *Nature Geoscience* (2014) DOI: 10.1038/ngeo2254

Provided by Victoria University