

Climate negotiation as a bargaining game

May 12 2014



New research from Northeastern University philosophy professors suggests that global climate negotiations would be more successful if countries worked together outside of global bargaining venues. Credit: Photo via Thinkstock.

For more than two decades, members of the United Nations have sought to forge an agreement to reduce global greenhouse gas emissions. But so far, these international climate negotiations have had limited success.

What's more, game theoretical modeling of the negotiations suggests that there are feasible solutions to the problem. That is, there are

commitments that the countries participating in the negotiations could agree to that would accomplish the targeted global emissions reductions. "So, if these solutions are there, the question is why negotiations have not yet reached them – why don't we have an agreement," said Ron Sandler, a professor of philosophy at Northeastern University who focuses on environmental ethics.

"We thought the problem might be not be with the potential solutions that might or might not exist, but rather reaching them from where we are now," added Rory Smead, an assistant professor of Philosophy at Northeastern and an expert in game theory.

In a paper released Sunday in the journal *Nature Climate Change*, Smead, Sandler, and their colleagues, including Northeastern Assistant Professor John Basl, put forth a new modeling approach that examines this very problem. The results suggest that side agreements, such as bilateral commitments between the US and China or those made in venues like the G8 and G20 summits may be even more important than previously suspected.

Most climate negotiation modeling studies have used [social dilemma](#) games such as the prisoner's dilemma, in which the best interests of the individual agent are not the same as those of the whole. But, as Smead said, "All countries in a sense want to solve this problem—what they disagree on is how to go about solving it."

So rather than using a social dilemma game, the research team used a bargaining negotiation model. Here's how it works: Multiple players must coordinate on an agreement with the goal of cutting global [greenhouse gas emissions](#) by the targeted amount. While each agent would like to keep his own reductions as low as possible, he would prefer to increase his proposal if it means the group would be more likely to reach a consensus. "If push comes to shove, they'd prefer to do

more," Smead said.

The game starts with each player making an initial proposal to reduce emissions by a certain amount. Then the players see what their fellow participants proposed to and readjust their own proposals. Repeating this several times will eventually either lead to a break down in negotiations or an agreement that makes everyone happy.

It's a simple model that doesn't take into account such things as national politics and enforcement scenarios, but it has an important feature: It reveals potential barriers to successful negotiations that might be hidden in more complex models.

The research team found that a few factors were extremely important in maintaining successful negotiations. In particular, agreements were more likely to be reached if the group was comprised of fewer agents rather than many; if the group consisted of a variety of small and large emitters; and if the perceived individual threat of not reaching an agreement was high.

"The results bare on a number of political questions," Sandler said. "For instance, while we ultimately need an agreement that includes reductions from almost everyone, side agreements among smaller numbers of participants don't undermine—but may actually promote—the U.N. process."

Since smaller groups are more likely to reach consensus, the researchers said, it would be better for a subgroup of countries to come to a consensus on its own and then bring that single proposal to the larger group.

"It would be much better if the rest of the world could figure out a potential agreement and then invite countries such as China and the U.S.

to the table," Smead explained. If that smaller group's offer is sufficient—that is, if it promises to reduce emissions by the proportional amount necessary to achieve the global goal—then it should be successful in the larger venue.

This suggests that efforts such as the G8 and G20 climate summits are actually beneficial to the efforts of the United Nations Framework Convention on Climate Change, which is considered the most important climate bargaining forum. Many have worried that these smaller efforts weaken UNFCCC's work, but the new research disputes that concern.

More information: Paper: www.nature.com/nclimate/journal/nclimate2229.html

Provided by Northeastern University

Citation: Climate negotiation as a bargaining game (2014, May 12) retrieved 25 April 2024 from <https://phys.org/news/2014-05-climate-bargaining-game.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.