Towards More Pragmatic Global Climate Goals and Policies

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Summary

The 2015 Paris Agreement represents an important step forward in global climate change agreements, by combining national goal-setting with a global framework to drive collective action. However, the sum of individual countries' nationally determined contributions falls far short of actions needed limit warming to 2°C, the goal agreed under the Agreement.

In this paper, we explore the climate and economic impact of four emissions pathways through 2200. We use the terms "emission pathways" or "emission paths" to refer to changes in the total volume of greenhouse gas (GHG) emissions over time under the modelled scenarios. Two of these pathways do not consider economic efficiency: a reference scenario without additional climate policy and a scenario that meets the 2°C by 2100 goal established in the Paris Agreement. Two further emissions pathways are the result of scenarios designed to minimize the economic impact of climate change, including mitigation, adaptation and residual damage costs. These two scenarios consider different rates of decline in GHG mitigation costs over time: one a constant rate of 0.5 percent and another with greater reduction in costs after 2050. For our analysis, we use the dynamic integrated climate economy (DICE) model developed by William Nordhaus of Yale University, with a global GHG mitigation cost curve developed by the Institute of Energy Economics, Japan (IEEJ).

The differences among these scenarios may offer insights for policymakers. The optimized case with greater cost reductions after 2050 results in a peak global average temperature increase of 2.3°C to 2.7°C, higher than the 2°C goal of the Paris Accord. However, the scenario that meets the Paris temperature goal incorporates disproportionately high economic cost up to 2100, with costs reaching nearly 4 percent of global GDP around 2090. By comparison, the more gradual emissions reduction paths associated with the optimal global welfare scenarios keep costs below 3 percent of GDP at all times. Furthermore, the optimized case with greater cost reductions after 2050 could achieve an outcome consistent with the 2°C scenario depending on the speed and degree of international collaboration.

Our modeling results demonstrate that balancing the mitigation, adaptation and residual damage costs is crucial to minimizing the overall cost of climate change to society. Although the agreed global goals may be challenging to reach, the mitigation commitments made in Paris do not come close and also do not meet our lower, economically efficient emissions paths. Reconciling the bottom-up approach of the Paris Agreement with the collective effort needed to effectively respond

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to climate change will be an ongoing challenge.

These results also emphasize the importance of continuing research and development in low-carbon and zero-carbon technologies. This represents a valuable hedge against uncertainty, as does carefully targeted financial support to move technologies from the demonstration to the commercial stage. Some action on climate change might be delayed until technologies become less expensive, but if the long-term costs associated with a changing climate are to be minimized, the substantial investment in research and development required to make this cost reduction possible should be made now.

Fundamental uncertainties make climate change policymaking highly problematic, while the transition to a low-carbon energy system will take decades to complete. Together these realities magnify the policymaking challenge facing governments. A practical approach to climate change policymaking provides the flexibility to respond quickly and effectively to evolving scientific knowledge, technological developments, community aspirations and commercial innovations. It would also support a more consistent and predictable approach that would allow for incremental development of specific policy and regulatory responses over time while providing sufficient high-level policy clarity to build confidence and encourage investment. This is a crucial precondition for encouraging efficient and innovative responses to achieve a timely transition that helps to meet climate change goals at least cost. Well-functioning markets could be key enablers in this context.

The Paris Agreement anticipates revisions and refinements every five years, which provides much needed scope for incremental policy development at the national level. A practical approach to climate change policymaking would complement the Paris framework, allowing governments to capitalize on its flexibility by facilitating the use of more incremental and adaptable policy responses that better reflect local resource endowments and socio-economic circumstances.