The National Academies of
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Division of Behavioral and Social Sciences and Education
Board on Environmental Change and Society (BECS)

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Moving on From Paris:
Implementation Lessons from Social Science

The Paris Agreement was the culmination of a year in which 188 countries submitted Intended
Nationally-Determined Contributions, or national climate plans, to the UNFCCC. The Paris Era's start
has been promising for its universality. Though they only project through 2025 or 2030, the agreed
contributions (Nationally-Determined Contributions, or NDCs) collectively will influence the shape of
future global emissions. They summed to over 95 percent of global emissions, and by some estimates
reduced the expected increase in global mean temperatures from 3.6 degrees C by 2100 to 2.7 degrees
(see Figure 1). This reduction by nearly 1 degree C, in an opening round of pledges in a process that
includes frequent evaluation and strengthening, seems to be a substantial achievement.

Effect of current pledges and policies on global temperature
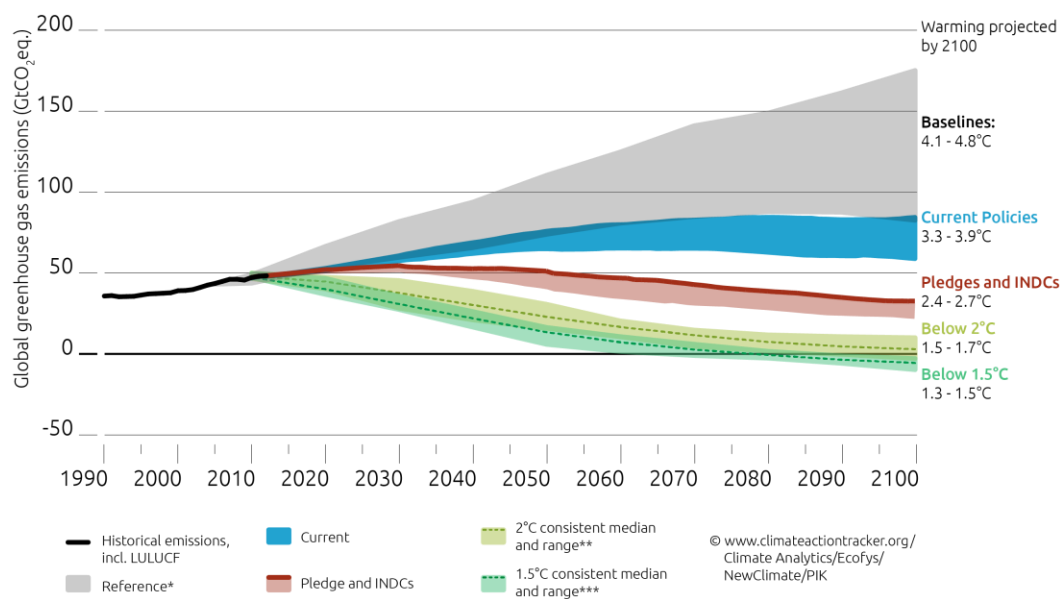
* 5%-95% percentile of AR5 WGIII scenarios in concentration category 7, containing 64% of the baseline scenarios assessed by the IPCC
** Greater than 66% chance of staying within 2°C in 2100. Median and 10th to 90th percentile range. Pathway range excludes delayed action scenarios and any that deviate more than 5% from historic emissions in 2010.
*** Greater than or equal to 50% chance of staying below 1.5°C in 2100. Median and 10th to 90th percentile range. Pathway range excludes delayed action scenarios and any that deviate more than 5% from historic emissions in 2010.

(from http://climateactiontracker.org/global.html, December, 2015)

But, what is the state of science that underpins translating the pledges, many of which are promises to implement policies such as improving energy efficiency or promoting renewable energy, into reduced emissions and changes in global mean surface temperature? In the US, for example, the President's Climate Action Plan, which serves as the basis for the US commitment to reduce emissions by 26%-28% below 2005 levels by 2025, includes a number of specific measures that can be grouped into (1) regulatory actions and standards such as cutting CO_2 emissions from power plants and reducing hydrofluorocarbons; (2) energy efficiency improvements, for example increasing fuel economy, appliance, and building standards and reducing financing and other barriers to investment; (3) promoting renewable energy; (4) sequestering carbon in forests and other land-based measures; and (5) a variety of demonstration and purchase agreements by Federal agencies.

How well do the models used in projecting future emissions and temperature change represent these measures, including uncertainty regarding their effectiveness? There are significant uncertainties in the models used to estimate their effects, to connect human activities, emissions, climate, and societal consequences. Some of these are related to the climate system's global and regional response to these emissions and associated land use. But some of the largest remaining research challenges and opportunities lie in the social sciences.

What is empirically understood about past experience in implementing the kinds of innovations and policies that comprise the NDCs? Many innovations and policies fail to meet expectations because they do not anticipate and account for unexpected institutional or behavior responses. Low energy prices, for example, reduce incentives for efficiency and make it more difficult for renewable energy to compete. Are there lessons from experience and research that could increase acceptance, smooth implementation, and accelerate progress beyond NDC reductions?

Research questions and needs
Having voluntary national pledges as the core of a global agreement is an entirely different system of international climate governance than the Kyoto system of binding pledges. Substantially more work is required on the technical, institutional and behavioral changes that will be necessary to meet the pledges made in the NDCs, and to drive stronger pledges in future rounds. Agencies in the US and elsewhere face significant challenges in identifying the appropriate incentive structures and policies that are most likely to lead to the technical, institutional and behavioral changes required to meet their pledges. What level of initiative should be prioritized—changes by states, institutions, or households and individuals? When are market-based incentives effective, and when are regulatory approaches, "nudges" or other efforts needed? What forms of verification and governance arrangements are most likely to be effective in helping the Paris regime lead to required reductions? Institutionally, how will the Paris Agreement's "Global Stocktake" in 2018 inform or mandate revisions in national NDCs for 2020, which are required to "ratchet up" in ambition?

This mini-seminar
This seminar will be held in conjunction with the April 28-29 spring meeting of the Board on Environmental Change and Society (BECS) of the National Academies of Sciences, Engineering, and Medicine. It will bring together the members of BECS, experts from think tanks, universities, federal agency officials, and leading civil society organizations, and program leaders from US agencies charged with researching various aspects of the environmental and societal consequences of Paris, from climate change to behavioral and institutional issues. The event will include structured and open discussions, with the goal of sharing observations and experiences, identifying major questions, and exploring directions for a new generation of post-Paris basic and policy-focused research.