

The promise of Paris

Policy makers seem ready to take new steps to tackle climate change. Research must draw on lessons from the past to find productive pathways for the future.

Government representatives are meeting in Paris to negotiate a new deal to push the world onto a lower-emissions path. They must be presented with strategies that are politically feasible if they are to catalyse significant action — strategies that will constrain costs and deliver benefits to society.

This puts a premium on research that translates science, from all disciplines, into actionable plans. Such research is hard to develop as it requires, among other things, a deep understanding of the policymaking process. Researchers are increasingly realizing the advantages of joining their efforts with policy experts to inform political debates. Scholars must find ways to conduct more of this research, and to develop strategies to disseminate the output to decision makers, if it is to get exposure in international negotiations.

Nature Climate Change has always committed to publishing research designed to inform the policy debate. This is continued with a new joint web focus with *Nature Geoscience*

(<http://www.nature.com/nclimate/focus/budgeting-for-climate-change/index.html>), exploring how the world's carbon budget is currently being expended, and translating findings into possible routes to transformational change.

For instance, there are several ways to account emissions — this refines but also complicates debates around responsibility. Analysis by Robert Jackson and colleagues suggests that the world could soon hit peak emissions, partially due to a drop in China's coal consumption, and below-average global demand for oil and natural gas alongside the growth of renewable energy (<http://dx.doi.org/10.1038/nclimate2892>). Karl Steininger *et al.* show how measuring emissions at different points in the supply chain provides different images of countries' contributions (<http://dx.doi.org/10.1038/nclimate2867>). Both pieces demonstrate how debates about burden sharing are (and should be) changing, with the old 'developed versus developing country' dichotomy dissipating.

Despite the upwards emissions curve beginning to bend, it is likely that policymakers across the globe will have to rely on some form of negative emissions technology (NET) to make deeper cuts. In the web focus, Pete Smith and colleagues (<http://dx.doi.org/10.1038/nclimate2870>) look at the biophysical and economic impacts of these technologies, outlining the limitations of such 'silver bullets'. They suggest that a mass rollout of a single NET, or any combination of NETs, will probably be economically difficult to achieve, and could ultimately have a significant impact on some other part of the ecosystem. This makes relying on such technologies a high-risk strategy.

Policy makers look ready to budget for change, both to the climate and to society as it seeks to mitigate and adapt. A research agenda that delivers knowledge to enable action will help them respond. □

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A milestone year?

The unprecedented climate events of 2015 should prompt action on the policy stage.

2015 began with the warmest winter on record on a global scale, and ended as the hottest year since records began, with average global temperatures reaching 1 °C above pre-industrial levels for the first time¹. But these were not the only records broken this year, as a large number of extreme-intensity events unfolded.

The winter snowpack in California hit a record low, prolonging one of the most severe and longest droughts in the USA². El Niño appeared shyly in May and then went on to become a monster, heating up the equatorial Pacific ocean by more than 3 °C by November³. Tropical cyclone Patricia went off the hurricane category scale with winds of over 320 km per hour, and the Arabian peninsula was hit by two consecutive cyclones — an unprecedented occurrence in the climate record of the region¹.

It is clear that many different factors have contributed to these events, and care must be taken before linking any particular event to climate change. But one thing is sure: human influence has significantly increased the likelihood of extremes⁴.

Extreme weather has the power to change people's perception of climate change — as happened after extensive flooding in England over the winter of 2013/14⁵. The unprecedented events of this past year prompted many world and religious leaders to make important public announcements to raise awareness on the seriousness of the issue. It is in this context that the international climate negotiations in Paris took place, where a global deal for the future of the planet was being discussed as these very words were being written.

Such events make one thing clear: time is at a premium. Global average

atmospheric CO₂ concentrations have indefinitely passed the 400 ppm mark⁶, reflecting the relentless increase in emissions. This puts us on a fast track to 2 °C of warming, which is considered to be a dangerous climate change threshold beyond which even more extreme events can be expected. If 2015 was a year full of climate milestones, 2016 has the potential to be another: the year when global society took firm and collective action to begin changing the dangerous path that we are currently treading. It is certainly a big New Year's resolution. □

References

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