Negotiating action

After years of working towards a climate accord, the Paris Agreement of 2015 marked the shift from negotiating to reach consensus on climate action to implementation of such action. The challenge now is to ensure transparency in the processes and identify the details of what is required.

The UN Framework Convention on Climate Change (UNFCCC) was adopted in 1992 to facilitate international cooperation on addressing climate change. Negotiations within the framework led to the Kyoto Protocol in 1997 at the third Conference of the Parties (COP). With internationally binding emission reduction targets, it was thought to be a positive step in climate action, but the lack of clarity on details and extended negotiations meant Parties were slow to ratify the agreement and it did not come into force until 2005. The USA did not ratify the agreement.

In the following years, there was increased effort and push to reach a strong agreement. Fast-forward to COP15 in Copenhagen, which was characterized by high optimism in the lead up. But, instead of a strengthened international agreement, there was a disappointingly vague commitment to limit warming to 2 °C.

Whilst there were hopes of a strong outcome from COP21 in Paris in 2015, all expectations were for an agreement with the target to limit warming to 2 °C. The push from the coalition of Small Island Developing States (SIDS) and Least Developed Countries (LDCs) for the more stringent target to limit warming to less than 1.5 °C above pre-industrial levels, which they argued was required to protect them from the harmful impacts of climate change, was successful. The momentum from Paris and the commitments made at the meeting carried through. The Paris Agreement entered into force a year later when the threshold — ratification from at least 55 Parties accounting for at least 55% of emissions — was reached on 5 October 2016. Apart from the public announcement of withdrawal by the USA (for further discussion on the potential implications of this, see L. Kemp, *Nature Climate Change* 7, 458–460; 2017), all other Parties have committed to the agreement with additional commitments coming from businesses (E. Gies, *Nature Climate Change* 7, 543–546; 2017), state and local authorities (M. Watt, *Nature Climate Change* 7, 537–538; 2017). The groundswell of support outside of

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national governments is encouraging as it helps build pressure towards action.

At the time of writing, COP23 is underway in Bonn, Germany. Presided over for the first time by a small island state, Fiji's Prime Minister and the current serving COP President, Frank Bainimarama, called for action in his opening speech, stating "we must not fail our people" (<http://go.nature.com/2zao39Z>). Fiji is a representative of SIDS, the nations who pushed for stronger ambition in Paris as they are already experiencing the negative effects of climate change. Daily life is being impacted by rising seas and seawater inundation, and extreme storms are occurring with greater intensity, which impact oceans and fisheries that feed many islanders. This all affects the economic growth of these nations. Fiji aims to highlight these issues, which will keep a focus on the impacts of climate change and why action needs to happen quickly.

This COP also marks the transition from negotiating to reach agreement on action to fine-tuning the way forward, in effect setting out the rulebook for the Paris Agreement. The past two years have presented a challenge not only for climate negotiators, but also for researchers to undertake the work that will inform the IPCC Special Report on 1.5 °C and how to

achieve this ambitious target. A key area of research has focused on the Nationally Determined Contributions (NDCs) — whether these are sufficient to limit warming, how progress towards these NDCs will be tracked, and what possible policies and actions are needed to achieve emissions reductions. The stocktake will occur in 2023, shortly after the release of the 6th IPCC Assessment Report which will inform the potential revisions. There is the expectation of increasing ambition from nations.

The stocktake will require information to assess the current progress, and this emissions tracking and standardized accounting are part of the Paris rules being negotiated at COP23. However, the ability to provide accurate emissions data on this timescale is currently hindered by large uncertainties in our understanding of carbon-cycle variability. This topic and how to reduce key uncertainties are discussed by Glen Peters and colleagues in a Commentary in this issue (page 848).

Whilst Paris has set the stage, it does not seem that action has started with a predicted 2% growth in emissions this year (J. Tollefson, *Nature* 551, 283; 2017). This would set 2017 emissions at the record-breaking 41 billion tonnes, not the news needed after a promising few years without emissions growth. To reach the ambitious targets, there needs to be a swift transition to emissions reduction, something the world is yet to see and requires transformation of energy systems. However, as highlighted in a Letter by Gokul Iyer and co-authors in this issue (page 871), NDCs need to be evaluated using more than just emissions accounting to ensure that the short and long-term goals are met.

Keeping the momentum for emissions reduction through the inevitable domestic political change requires strong commitment and unity to come from this COP. □

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