

# THIS WEEK

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## Agree to agree

*The US–China emissions agreement raises hopes for international cooperation on a climate accord. But it does not go far enough.*

**R**oughly 44% of the carbon dioxide that humans release into the atmosphere each year comes from China and the United States. These countries are the big fish at the United Nations climate negotiations, and for years they have been at loggerheads, each deflecting calls to curb emissions by pointing to the other. As talks languished and emissions increased, the rest of the world's major emitters often seemed content to sit back and point the finger at them. Now that these two powerhouse polluters have brokered an unexpected deal on emissions, can the world hope that those days are in the past? All eyes are on the UN climate meeting in Lima next week (see page 473).

The chances of forming a meaningful climate agreement at the follow-up UN summit in Paris next year have clearly improved, but a dose of scepticism is warranted. Under the US–China agreement, inked in Beijing on 12 November by presidents Barack Obama and Xi Jinping, the United States would curb its emissions by at least 26% by 2025, and China would hasten the development of low-carbon energy to ensure that its own soaring emissions peak around 2030. These are not insignificant targets, but both nations could do more if they were really serious about addressing climate change. Moreover, both pledges come shrouded in their own particular doubt.

From the US perspective, Obama has two years left in his presidential term to get the ball rolling and even if he succeeds, that ball will roll into an uncertain future. His primary weapon is a proposed set of regulations for existing power plants, which the US Environmental Protection Agency says would reduce emissions by 30% from 2005 levels by 2030. Assuming that they clear the inevitable court challenges, these regulations and the action already taken on vehicle fuel efficiency will go a long way, but more will be needed.

As it stands, many Republicans are lined up against the president's climate policies. They have already been critical of Obama's agreement with China, and as of January they will control both houses of Congress. Some observers predict that policies on climate could be among the major issues in the presidential election two years from now. That would be a welcome first, because much will ride on the outcome.

As for China, the headline promise is maddeningly vague: 'around 2030' does not tell us precisely when emissions will peak, and Xi did not specify how high emissions will climb before then. China is already on track to meet its existing goal of producing 15% of its power from low-carbon sources by 2020. So its promise to extend that to 20% by 2030 makes the latest commitment less than revolutionary. And although some energy researchers have suggested that China could level off its emissions by 2025, most baseline scenarios suggest that without active engagement, the country's emissions would continue to rise until 2050, albeit slowing down once more Chinese citizens have finished filling their homes with energy-hungry appliances.

This agreement has as much to do with political momentum as commitments. The stand-off between the United States and China is emblematic of a larger rift in the negotiations and has its roots in

both morality and science. Developing countries rightly expect those who have profited from polluting the atmosphere to lead the way in curbing emissions; industrialized countries rightly counter that they cannot do it alone, given that most of the growth in greenhouse-gas emissions is in the developing world, where more than 1 billion people still live without electricity. Unfortunately, the climate does not care about such questions.

***"The stand-off between the United States and China is emblematic of a larger rift."***

Five years ago, at the most recent headline climate summit in Copenhagen, world leaders took their first step in breaking down the legal wall between developed and developing countries. Until then, under the 1997 Kyoto Protocol, only developed countries — notably minus the United States, which ducked out — had obligations to reduce emissions.

In Copenhagen, many developing countries stepped forward with climate pledges, but the negotiations nearly collapsed. Significant battles remain over commitments, financial aid and how to structure an agreement, but most countries now accept that this must be a collective effort.

In theory, the US–China agreement is the last major piece of this puzzle. If it translates into cooperation on a new climate accord, other countries may be encouraged to engage seriously. At a minimum, those who have been pointing the finger at the United States and China would need to come up with another excuse.

All involved will get the first glimpse of how this changes the international dynamic when negotiators gather in Lima. Fingers crossed. ■

## Ebola opportunity

*A slowdown in new cases offers a chance for control efforts to get ahead of the epidemic.*

**A**n apparent slowdown in new cases of Ebola disease in Liberia and Guinea should be taken advantage of. Almost one year after an Ebola epidemic began in West Africa there are at last encouraging signs that it may be receding in some regions. But those responding to the epidemic must not drop their guard — rather, they should seize upon the chance to finish the job.

"Today, we — two dumbfounded doctors — stare at our empty blackboard. We have no more patients." Last week, that declaration was blogged by a doctor with the humanitarian agency Médecins Sans Frontières (MSF), also known as Doctors Without Borders, at an Ebola treatment centre in the Foya region of Liberia. It is the same

story in many parts of the country: empty beds that would have been unthinkable just a few weeks ago when Ebola treatment centres were overflowing. Nationally, the growth in the numbers of those infected in Liberia, the worst-affected country, is no longer exponential but has flattened off.

The epidemic has also stabilized in Guinea. But a resurgence of cases in Sierra Leone is a timely reminder that until Ebola is eliminated throughout West Africa, it remains a major threat. As of 18 November, Ebola has infected at least 15,000 people and killed 5,440 of them in these three main affected countries. But the worst-case scenarios predicted by mathematical modellers, which projected a steady apocalyptic rise in Ebola case numbers, have proved far off the mark (see *Nature* 515, 18; 2014).

Although complacency is as unwise as it is hopefully unlikely — a lull in Ebola cases in the spring prompted authorities to drop their guard, only to see the virus return with a vengeance — there are reasons to believe that the current lull in Liberia and Guinea may continue. And that offers an opportunity to roll back the epidemic at last.

The exact causes of the lull are unclear. Belated international Ebola control efforts are only now beginning to kick in, and have no doubt contributed. But much of the slowdown is perhaps due to Africans themselves coming to terms with the epidemic and blocking its main routes of transmission. In particular, there has been a reduction in traditional burial practices, which are a key source of spread.

The slowing of new cases in Liberia and Guinea is a welcome reprieve for the health-care workers and scientists who have toiled to control a virus that for months has held the advantage. It is an opportunity to regroup, to consolidate gains, and to go all the more on the offensive.

Until recently, MSF, based in Geneva, Switzerland, was the only serious international presence fighting Ebola on the ground, but logistics meant that it could operate only a few large centralized treatment centres. These large centres, often with hundreds of beds, are still needed to absorb any resurgence, particularly in urban areas. But having only

large centres is not ideal. Patients often have to travel for many hours or even days to reach them, and by the time they make it are often beyond recovery. They are also likely to have contaminated others en route, so fuelling the spread of the virus.

With its caseloads falling in recent weeks, MSF is coming out of the trenches and taking the fight to the virus, sending mobile teams and smaller treatment centres to the sites of new outbreaks to try to nip them in the bud. MSF sensibly wants other aid groups to adapt in a similar way. It will be a challenge for the more bureaucratic UN Mission for Ebola Emergency Response, and the US and other national Ebola-treatment efforts, to quickly change their plans, because they are mainly based around large centres.

But it is crucial that the response to Ebola is flexible in the face of the shifting epidemiology.

The slowdown is also buying precious time for the testing of drugs and vaccines: clinical trials of vaccines in particular are being fast-tracked, with the first results due at the end of 2014. Unfortunately, however, drugs and vaccines have captured the spotlight and resources, while more mundane interventions that could have an immediate impact have been neglected. Better rehydration and electrolyte control can dramatically reduce mortality: the case fatality rate for patients treated in rich countries has been a fraction of the 70% seen in West Africa. Testing convalescent blood and serum from survivors — a potentially game-changing treatment — should also be a priority.

At the start of October, the United Nations and the World Health Organization set quantitative targets for safe burials, contact tracing and other key public-health control measures, which the international community was to meet by 1 December. It is already obvious that most of these targets will not be met. The breathing space offered by the current lull in Liberia and Guinea offers an opportunity to fill gaps and ramp up coverage of countermeasures. It must not be wasted. ■

## Moon on a stick

*A crowdfunding lunar mission might seem like a long shot — but there is no harm in trying.*

The crowdfunding platform Kickstarter is popular with inventors of fashionable bike helmets, hover boards and even a smart frying pan that tells you when to flip a steak. But last week the site that has funded thousands of films, games and gadgets launched a funding effort for something much bigger: a mission to the Moon.

On 19 November, under the banner of 'Lunar Mission One', a UK-led consortium announced a goal to put a lander on the Moon by 2024 and to retrieve and analyse samples from 100 metres below the lunar south pole. The mission itself would cost around US\$1 billion. For starters, it needs \$1 million by 17 December. As *Nature* went to press, it has more than half of that.

Attempting to invert the fund-raising model for science missions, the project would get its cash by encouraging many thousands of people to give a few dollars. In return, investors get the chance to preserve a little bit of themselves in a time capsule that will fill the borehole: either in a digital form, in a 'memory box', or with a strand of hair. The latter would cost as little as \$80.

This is not the first science project to seek crowdfunding. For example, last year, synthetic biologist Omri Amirav-Drory, founder of the company Genome Compiler, raised \$480,000 on Kickstarter to create glowing plants. Nor is it the first private venture to shoot for the Moon — the companies that compete for the Google Lunar X Prize are the most notable.

So how seriously should we take the new Moon shot? Certainly the institutions involved are solid enough. University College London and RAL Space, part of the UK Science and Technology Facilities Council and a partner in more than 200 space missions, have assessed the feasibility of the mission. The Open University in Milton Keynes, UK, is working on the educational side. High-profile celebrity scientists and former UK science ministers have clamoured to back the venture, and seasoned academics from universities across the United Kingdom have built the mission's science case.

The promised science is interesting. Europe has never sent a lander to the lunar surface, and no nation has ever visited its south pole. Permanently shadowed craters there are thought to contain water, and digging deep into the surface could answer countless unsolved questions about the Moon's history. And the timing is good. Space science is basking in the glow of ESA's Rosetta mission, which landed a probe on a comet earlier this month.

But \$1 billion? Organizers aim to fill a gap in public funding in a way that neither detracts from existing space missions nor puts governments in a predicament. The mission gets funding only if people care enough to contribute, says Richard Holdaway, director of RAL Space. "It's not about deciding whether to spend money on a space programme or a new hospital," he says. "It's democracy at its greatest level."

Perhaps wary of pouring cold water on an aspirational and ambitious plan, sceptics have been surprisingly hard to find. The effort is plainly ambitious. But, the message seems to be, where is the harm in trying? If Lunar Mission One misses its funding target, the programme simply stops, having broken the first rule of any sales effort — offer a product that enough consumers want. ■

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