Saving the Paris Agreement: methane's new hope.

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The Paris Agreement is not on track to meet its goals. But there's a sliver of hope. Something can be done about methane, the second-most important anthropogenic greenhouse gas. With a lifetime around a decade, cutting methane will have rapid impact. Much of the hope rests on China's new Methane Emissions Control Action Plan, accompanying the joint commitment for methane action announced with Chinese Premier Xi and US President Biden's November meeting.

The UN climate summit now underway (COP28) intends a 'global stocktake' of Paris Agreement progress. The unexpected complication is methane's accelerating growth, now around 15 ppb/yr. Though methane's growth may include climate feedbacks in the natural biosphere, particularly wetland emissions, the remedy is urgent deep cuts in human emissions. Towards this, COP26 in 2021 launched the Global Methane Pledge. 150 countries have promised 30% reductions in anthropogenic emissions by 2030. If these pledges are fully implemented, the Paris Agreement still has a chance.

But for many signatory nations there is an widening gap between promises and concrete actions, a gap that urgently needs to be tracked by improved independent scientific measurement. Critically, China, the world's biggest source of anthropogenic methane, has not joined the Pledge, nor have major emitters India, Russia, Iran, and South Africa. Satellite observation suggests Chinese emissions in 2019 were about 65 million tonnes (Mt), or 15-20% of global anthropogenic emission, comparable to China's proportion of Earth's population. Thus China's new plan has major importance, though lacking timetabled targets.

To join the Pledge, China must cut emissions around 20 Mt/yr emissions by 2030. Is this achievable? There is precedent. In a similar period, 2002-2009, Britain cut methane emissions by over 30%, with per capita emissions now lower than China's, and approaching India's. Some mitigation costs are low or even negative. Satellite observation, though with very wide uncertainty, suggests China annually emits roughly 19 Mt from the energy sector, 18 Mt from livestock, 16 Mt from waste and other sources, and 12 Mt from rice agriculture. Between 1997-2004 the UK nearly halved methane leaks from energy sources. Though reducing coal emissions is not easy, by 2030 China may achieve up to 8 Mt cuts. From waste and other sources, China might cut another 8 Mt. Some livestock (e.g. manure) and rice emissions are tractable: China might cut 4 Mt. With determination, China could meet the Pledge by 2030.

Europe and the US are doing much to reduce emissions, tightening regulatory frameworks. If China too fulfils the Global Methane Pledge, the benefits will be profound, to China itself, and to the world. India, another great methane emitter and possible critical point of failure for the Paris Agreement, might address its waste heaps, coal vents, and biomass fires, also cutting air pollution, a potent benefit in itself. Big emitters Russia, Iran, and South Africa similarly have multiple reduction options.

Coal, a huge methane source, troubles many non-signatory nations. Coal provides mass employment and national energy security. Abandoning coal takes decades and brings profound social distress, unless counterbalanced by investment in alternatives. Europe made many mistakes reducing its coal industry. The political costs still reverberate. But it can be done.

COP28 will hear clamour for loss and damage climate reparations. In the Rio Declaration and March 1994 Framework Convention on Climate Change, humanity first recognised global warming's danger. There is thus a "polluter pays" argument that anthropogenic greenhouse gas emissions since 1994 are culpable, incurring reparation obligations. A good way to begin lessening reparation risk is to fulfil the Global Methane Pledge.

China and India, the most populous nations, will suffer greatly from climate warming impacts. So will the US, Australia, and Canada, with much higher per capita methane emissions. Nations must prioritise between energy security and food security. If gas and coal come first, and anthropogenic methane emissions continue to drive global warming, the climate threat to food crops grows. Energy has many sources, but food has few. To eat securely means minimising climate risk. All nations need urgent, determined action to cut methane emissions, giving the Paris Agreement a chance.

US President Lincoln once offered this choice to Congress "We shall nobly save or meanly lose the last best hope of Earth". To avert ruinous climate impacts, Earth's last best hope is the Paris Agreement. We should not abandon that hope. It has a chance; we should nobly save it.