

# Solving the Climate Dilemma

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History and the science of cooperation both suggest that the Paris “pledge and review” process will fail. To solve the climate problem, the negotiation process must address the incentive to free-ride on others’ cooperative efforts, and this requires a common commitment, not a patchwork of individual commitments. We propose a common commitment that can lead to a strong treaty and makes enforcement effective.

## A common commitment example

Climate negotiations are missing a key idea: self-interest can be redirected away from free-riding and toward cooperation. This is often assumed to be impossible. So we begin with a simple example that does this and reflects the basic incentives underlying international climate negotiations. To show its power, we assume that all players are completely selfish.

You and nine other self-interested players (representing countries) play a game. Each player has \$10, of which they simultaneously pledge some part to the common pot. A referee makes sure they honor their pledges. Every dollar placed in the pot will be doubled and distributed evenly to all players. So putting a dollar in the pot will return 20¢ to each player.

First, consider the Individual Commitment (IC) game in which pledges are independent of the pledges of others. This is the classic public-goods game, and the rational strategy for the narrowly self-interested is to contribute nothing, since this makes a player better off no matter what the others do. The result is the famous tragedy of the commons. Cooperation does not occur even though everyone would gain from it.

Second, consider the Common Commitment (CC) game in which players commonly commit to match the contribution of others, but to not do more. More specifically, suppose the referee simply makes sure that all contribute the amount of the lowest submitted pledge. After enforcing this common commitment, the money is doubled and distributed evenly, exactly as before.

This changes everything. Pledging \$0 will mean simply keeping your \$10, while pledging \$10 could result in ending up with anything between \$10 and \$20, depending on what others pledge. So, even though you are completely selfish, since you cannot lose and could gain by pledging \$10, that’s what you would do. So all pledge \$10 and the group’s \$100 is doubled and all end up with the maximum amount of \$20. Because the common commitment protects against free-riding, completely selfish behavior has been changed from “contribute nothing” to “contribute everything”, and so, with no increase in altruistic ambition, the outcome has changed from dismal to full cooperation. Changing the game by adopting a common commitment made the difference and redirected self-interest toward cooperation.

This should not be surprising, as all disciplines dealing with human cooperation find that the reciprocity of a common commitment—“I will if you will”—is the key principle underlying human cooperation. It is the most robust pattern of cooperation seen in laboratory, field and theoretical studies of free-rider situations, and is consistently found to stabilize higher cooperation levels<sup>2</sup>.

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<sup>2</sup> E. Ostrom (1990), *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press; D. Fudenberg and J. Tirole (1991) *Game Theory*, Cambridge, MA: MIT Press; S. Bowles and H. Gintis (2013), *A Cooperative Species: Human Reciprocity and Its Evolution*, Princeton University Press; Kraft-Todd et al. (2015), “Promoting Cooperation in the Field”, *Current Opinion in Behavioral Sciences*, 3:96–101; see also the references in chapter 3.10.1.4 of the “Mitigation of Climate Change” volume of the Fifth Assessment Report of the IPCC.

## Why “pledge and review” will fail in Paris

The Paris approach, “pledge and review”, involves individual commitments, similar to the IC game above. It requires countries to announce “Intended Nationally Determined Contributions”, called pledges, and then allows review and updating of the pledges before they are written into a “universal climate agreement” as individual commitments<sup>3</sup>. The hope is that *reviewing* pledges is a new and powerful way to increase “ambition” that will “enable an upward spiral of ambition over time”. But the comparable renewal of Kyoto’s phase one, at the 2012 Doha conference, resulted in Japan, Russia, Canada, and New Zealand leaving the agreement.

The empirical literature on cooperation in such games confirms that individual commitments, such as intended nationally determined contributions, cannot solve the dilemma. In the last forty years, this game has been the subject of numerous experiments, many of which included the opportunity for players to monitor, review, and renew their commitments. The predominant finding is that ambition starts out at a moderate level and *declines* as the reviewing process reveals that others are either free-riding or skimping on their commitments to avoid having others free-riding on them<sup>4</sup>.

Moreover, Kyoto failed with essentially the same approach: After more than a year of trying to find a commonly acceptable commitment formula for setting emissions caps for individual countries, the negotiators gave up and turned to individual commitments, just like in our IC game example. In the end, Kyoto Chairman Estrada simply “invited Annex I Parties to submit their revised, final numbers to the podium”. Each party submitted intended nationally determined contributions and “these numbers were simply inserted ... into the blank draft annex B”<sup>5</sup>. The result was a patchwork of weak and unstable individual commitments.

## Enforcement is a complement, not a substitute to a common commitment

Many consider enforcement to be the missing ingredient in the Kyoto Protocol and the crucial element for success. This is half right. Enforcement and a common commitment are complements and both are required. Notice that both the IC and CC games had perfect enforcement, so cooperation did not come from enforcement alone, but from changing the game to one based on a common commitment.<sup>6</sup>

This can be further illustrated with a simple example. Imagine people choosing their individual speed limits. There would be no use enforcing them, as everyone would just choose their maximum desired speed as their limit, and would then drive as they wanted. Instead, by voting, people choose and agree to a common speed limit which is lower (stronger) than almost everyone’s individual limit would be. They agree to this because this limits others and not just themselves. One important point of this example is that both a common commitment and enforcement are necessary. With individual commitments, there is nothing meaningful to enforce; whereas, enforcement plays a key role in strengthening a common commitment. A common commitment leads to a stronger agreement than individual commitments, and it makes enforcement (such as cross-border tariffs) both meaningful and necessary.

## Quantity commitments cannot be common commitments

All Kyoto negotiators wanted to find a common quantity commitment, and various countries suggested at least 10 different formulas to determine each country’s quantity commitment. Yet, they could not agree.

The proposal that received most attention was to reduce emissions by a constant percentage relative to 1990 emissions. Yet, in the end, individual commitments ranged from an 8% decrease to a 10% increase. And within

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<sup>3</sup> Ad Hoc Working Group on the Durban Platform, ADP.2014.6.NonPaper, 7 July 2014.

<sup>4</sup> See, e.g., J. Ledyard (1995), “Public goods: A survey of experimental research”, in J.H. Kagel and A.E. Roth, eds., *The Handbook of Experimental Economics*, NJ: Princeton University Press, 111-194.

<sup>5</sup> J. Depledge (2000), *The Origins of the Kyoto Protocol*, prepared under contract to the UNFCCC, FCCC/TP/2000/2.

<sup>6</sup> When Iceland made its individual commitment to the Kyoto Protocol it said it thought it could not keep it. Had Kyoto adopted strong enforcement, Iceland would have weakened its pledge rather than risk the nearly inevitable punishment.

the EU's 8% decrease, there was more than a 60% range of commitments. And the US and developing countries accepted no commitments at all.

Kyoto's percent-emission-reduction failed because countries differ substantially; for example, some economies declined after 1990 and some grew. To be cautious, the developing countries must build in high growth aspirations, implying rapidly increasing caps. Rich countries oppose this, and so poor countries fear being saddled with caps that curb their growth. Instead they reasonable see it as fair to allocate emission permits on an equal per-capita basis. This would result in huge wealth transfers from rich to poor countries. As a result, the proposals for a common quantity commitment are unacceptable<sup>7</sup>. In fact, there is no longer any serious discussion of a common quantity commitment. The US government has come to the same conclusion<sup>8</sup>. The developing countries still have not accepted any quantity commitments within the Kyoto framework. A common quantity commitment will not be discussed at COP 21 in Paris.

### **Price is ideal for a common commitment**

A small but increasing number of prominent climate policy experts, including Weitzman, Stiglitz, Nordhaus, Dion and Morris, as well as ourselves, propose an alternative: a global price commitment<sup>9</sup>. The proposed global price commitment is flexible. It would allow fossil taxes, cap-and-trade, hybrid and other national policies. It should thus not be confused with a global carbon tax. It would allow a system of linked carbon-permit markets that achieve at least the global price. All that an international price commitment requires of a country is that its average carbon price—carbon revenue divided by carbon emissions—be at least as high as the global carbon price.

Unlike with a common global *quantity* commitment, a uniform price is a common-commitment focal point that is widely agreed on. The price level can be determined by a simple voting procedure—a super-majority rule that would produce a coalition of the willing. Within that coalition, the global price would be a consensus view.

Unlike cap-and-trade, carbon pricing allows countries to keep all carbon revenues, thus reducing what can be an enormous risk of needing to use foreign exchange to buy expensive credits from a rival country. Moreover, total taxes can be held constant with a green tax shift—reducing taxes on good things such as employment, by charging for pollution. This could mean there is no net social cost to pricing carbon, even before counting climate benefits.

Of course a global price does not automatically result in acceptable burden sharing even though equal pricing is considered a relatively good proxy of equal effort. Consequently a “Green Fund” will be needed to transfer funds from rich to poor countries. To minimize the inevitable disputes over fairness, the objective of green-fund transfers should be to maximize the global price of carbon. This can be implemented in a way that encourages rich countries to be generous and poor countries to vote for a higher global carbon price<sup>10</sup>.

### **Conclusion**

Climate is a serious challenge because the atmosphere gives a free-ride to countries that emit. But negotiators can design the negotiation process to promote cooperation by using a common commitment. This will assure players that others will match their efforts and not free ride. Simply making free-riding visible with a review cycle, as planned for the Paris agreement, has been shown to likely lead to a weak start and unraveling, and not to an “upward spiral of ambition”.

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<sup>7</sup> E.g., J. Stiglitz (2006), “Saving the Planet”, chapter 26 in *Making Globalization Work*, Norton.

<sup>8</sup> In its 11 March 2013 submission, the US stated, “It is hard to imagine agreement on any formula or criteria for imposition of contributions, as this would get into the most controversial issues”.

<sup>9</sup> For references and more details, see the forthcoming “Symposium on International Climate Negotiations” in *Economics of Energy & Environmental Policy*.

<sup>10</sup> P. Cramton and S. Stoft (2012), “Global Climate Games: How Pricing and a Green Fund Foster Cooperation”, *Economics of Energy & Environmental Policy*, 1:2.

According to a growing number of policy and academic experts, a global price commitment, which has so far been excluded from consideration, would be the ideal basis for a flexible common commitment, because it is agreeable, fair, easy to handle, less vulnerable to gaming and consistent with climate policies already in place.

After decades of failure, surely it is worth attempting a fresh approach, one that is guided by the science of cooperation. Indeed, the advantage of a common price commitment is not just a matter of degree or of some gain in economic efficiency. A common price commitment would harness self-interest that is aligned with the common good. Nothing could be more fundamental.