

Climate Incentives: the Themis Mechanism

Carl Edward Rasmussen

Cambridge University

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Outline

- our climate crisis
- about cooperation
- what must coalitions be like?
 - commitments
 - fairness
- conclusions

The Carbon Dine and Dash Deficiency

The **carbon dine and dash deficiency**: Climate change is driven by a single structural flaw: the user of fossil fuels enjoys the immediate, local benefit, while leaving the cost for the global community and future generations.

Effectively addressing climate change is a collective action problem. It requires that we

- cooperate
- to remove the separation between climate cost and benefits.

This talk is about

- the principles
- a concrete proposal: the Themis Mechanism

which could govern a climate coalition (or club).

Climate Incentives

Governance based on altruism is fragile and impractical. Therefore the real challenge is to promote **governance which aligns self-interest with the common good.**

When a nation, comprising 1% of the world, like the UK, makes an investment to limit greenhouse gas emissions:

- 1% of the climate benefits manifest in the UK.
- 99% of the climate benefit manifest elsewhere.

It's not that investment towards emission reduction doesn't pay off, it just mostly pays off elsewhere.

This poor national return on investment makes nations stall climate action.

Three illustrative games

The independent commitment game:

- ① players can invest an amount of their choice in a communal pot
- ② the pot doubles in size
- ③ the pot is shared equally between all players

Let's say there are 100 players, each with €1.00. How would you play?

Investment is good for everyone: if all 100 players invested €1.00, everyone would end up with €2.00.

But what would be your **return on investment**? Compare not investing with investing €1.00. The difference (irrespective of what others do) in payout is €0.02: that's **-98% return, terrible!**

It leads to defection or free-riding.

Three illustrative games

The fixed budget game:

- ① players can invest an amount of their choice in a communal pot, subject to the condition that the total budget must be met
- ② the pot doubles in size
- ③ the pot is shared equally between all players

There are 100 players, each with €1.00. The budget is €50.00. How would you play?

Because the budget is fixed, the payout is fixed at €1.00. Players become **adversarial**. It's a zero sum game. No cooperation can take place.

Three illustrative games

The common commitment game:

- ① players can pledge an amount of their choice towards a communal pot; only the part of the pledge which is *common to all* is invested (the rest is returned)
- ② the pot doubles in size
- ③ the pot is shared equally between all players

There are 100 players, each with €1.00. How would you play?

There is no reason not to pledge the full amount. You cannot be exploited by free-riders.

The common commitment is key.

Three game conclusions

The games are instructive ...

- the "pot is shared equally" is the crucial aspect of "common-pool resource" (CPR) problems
- "independent commitment" games get sunk by free-riders
- "fixed budget games" are zero-sum. They turn players against each other (adversarial)
- "common commitment" games changes everything: encourages cooperation, or alignment of incentives

... but simplistic ...

- there is no notion of time
- it assumes that agents are equivalent. But real nations differ. So how should we interpret "common commitment"?
- it is not practical that a single nation could prevent a successful coalition

Climate Coalitions

What do we know *must be true* for effective climate coalitions?

Qualification: I am considering here a climate coalition in the narrowest possible sense. Objective to reduce greenhouse gas concentrations.

- The atmosphere is a common-pool resource (CPR). Everyone benefits from reduced emissions, this creates a free-rider problem; there is pressure on nations individually to do as little as possible. Therefore, **membership must be in the self-interest of nations**.
- because of the common pool resource property, for **climate coalitions big is beautiful**.
- unanimous membership is not an appropriate organising principle, because it is a structural guarantee that the least ambitious nation sets the agenda. **We must accept non-members** in principle.
- coalition **commitments must be common**; bespoke agreements would be intractable.
- coalition commitments must be conditional (or reciprocal) "I will if you will". This implies **simultaneous actions: no-one goes first**.

Commitment type: cap or price?

- a cap *seems like* the most direct approach
- because energy requirements are *inelastic*, in practice a cap implies a price (aka cap and trade); the real distinction is which is **explicitly set**.
- caps preclude cooperative behaviour; caps are fixed total budget, they imply zero sum behaviour
- caps can't co-exist with other approaches: caps dominate environmental outcomes
- even in a capped system, the price is the real objective
- carbon pricing is often said to be socially regressive: depends entirely on how proceeds are used!
- caps allow handing out allowances (political convenience)
- in national systems, specifying a price carries political liability

What common commitment?

Common commitments (or rights and responsibilities) must be attractive to nations in widely different circumstances.

Two types of emission pricing: international transfers and domestically retained pricing.

International transfers: pay money into global pot, and distribute according to population. Easily justifiable from equitability point of view.

Either type won't work on their own, for opposite reasons:

International transfers: to be effective at changing behaviour, prices would need to be significant. But this implies very large cash transfers, which are politically impossible.

Domestic pricing: prices would have to be identical across the world to avoid distorting competition. But wealth per person is very different across nations: fees would be easy to meet for rich nations, but crippling for poor nations.

The solution is to combine both.

How would pricing work?

Domestically retained pricing would simply be a (minimum) price p for emitting a ton of CO₂e. This would rule out subsidies.

International transfers: collecting a fixed price t per ton of CO₂e and distributing equally to (member) population is *equivalent* to charging (and paying) only for excess per capita emissions.

In other words: above average (per capita) emitters pay, and below average emitters get paid.

The international transfers balance: no separate finance is needed.

We have created a governance issue: how to agree on the two prices p and t .

Agreeing on prices and membership

This is complex. Prices and membership are interdependent. What price a nation would accept depends on membership, because climate pay-off depends on coalition size. Both need to be determined simultaneously.

Democratic voting is not a good option, because its basis is that voters accept the outcome, which won't work well for sovereign nations.

Instead, an *elicitation process* is required, which extracts information from nations about their views on the relationship between price and membership, and a principle to fuse these views into specific choices.

An important issue for elicitation processes is to what extent the process can be manipulated: can nations achieve better outcomes by responding strategically rather than honestly, and how big an effect does this have on fairness?

Unfortunately, game theory offers mostly negative results; and no applicable tight guarantees.

One positive result is: repeated, transparent games have much superior properties to one-off or secret processes. Because it lets partners build trust.

Legitimacy

How can this approach find legitimacy?

It rests on many sound principles. But it also makes some choices, which could perhaps have been made differently. For example, to carve out and separate ongoing from historical emissions and details about the elicitation process.

How can such choices, even in principle, be broadly legitimised?

The answer, it seems to me, has to be, that the effects of following the proposals are much better to a large majority, than not following them.

It's not that Themis is absolutely fair; it's just much better than what we have at the moment. Since carbon dine and dash is so poor, there is much scope for improvement.

As a proposal gains acceptance, that intrinsically makes it more attractive; exploit this virtuous dynamic.

Annual cycle guarantees reinforcement of trust, flexibility, no open-ended commitments.

The Themis Mechanism

The *Coalition Authority* (CA) administers the Themis Mechanism in an annual cycle:

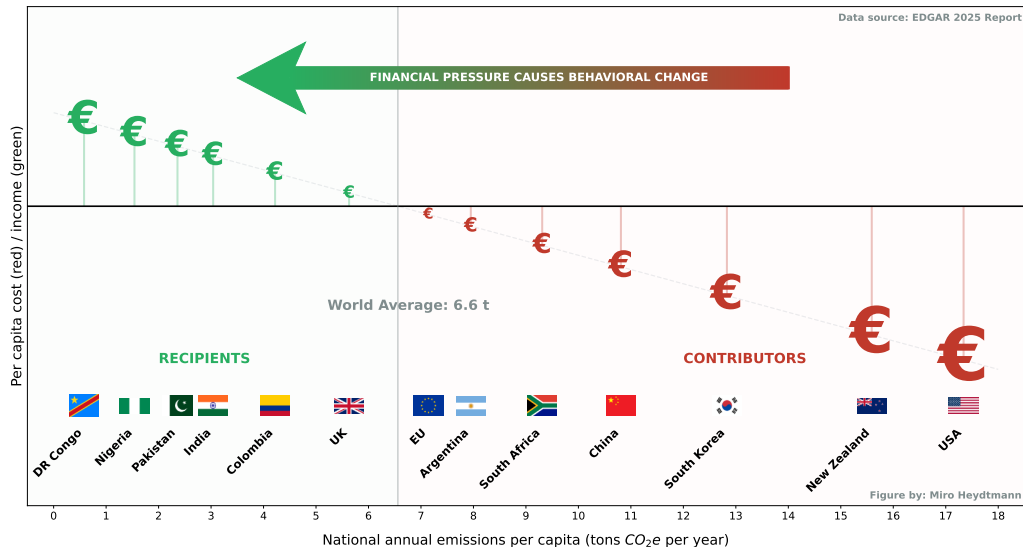
- ① all nations are invited to join the coalition at predefined price p and international transfer t
- ② members enforce the domestic price p , report their emissions (using the established UNFCCC reporting rules), and pay (or get paid) t times their excess emissions to the coalition
- ③ next year's p and t are determined by a member elicitation process

In the inaugural year, the prices is set to zero.

Themis immediately creates economic pressure on all nations to emit less. The annual cycle creates trust.

The Themis Mechanism

The Themis Mechanism: wealth redistribution assuming universal membership



Next steps

What do we need to *do*?

Understanding cooperation is the missing piece:

- it's not complicated
- but it's not conventional. New ideas take time
- tell your friends, your colleagues and your politicians about it.

We need nations to express their price preferences – this is actually not a big ask. It's not a commitment.

The question is not: what are you willing to do – it's what will you do if others do the same.

The most effective thing you can *do* is to embrace and promote the ideas of **conditional common commitments**.

Conclusions

Solving our climate crisis requires cooperation: reciprocal agreements and common commitments.

It's not about altruism. It's about enabling you to act in your self interest.

The Themis Mechanism is a simple, concrete and detailed proposal for how to implement climate cooperation.

People and policy makers are not yet thinking about this in the right way.

We can solve the problem. We must adopt good principles. It won't solve itself.

Climate change is not an intractable problem.