The Global Climate Scheme – Policy Brief

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1 Introduction

> "At the Paris agreement in 2015, all countries have agreed to contain global warming 'well below +2 °C'. To limit global warming to this level, **there is a maximum amount of greenhouse gases we can emit globally**.
> To meet the climate target, a limited number of permits to emit greenhouse gases can be created globally. Polluting firms would be required to buy permits to cover their emissions. Such a policy would **make fossil fuel companies pay** for their emissions and progressively raise the price of fossil fuels. **Higher prices would encourage people and companies to use less fossil fuels, reducing greenhouse gas emissions.**
> In accordance with the principle that each human has an equal right to pollute, the revenues generated by the sale of permits could finance a global basic income. **Each adult in the world would receive** $30/month, thereby lifting out of extreme poverty the 700 million people who earn less than $2/day.
> **The typical [American] would lose out financially [$85] per month** (as he or she would face [$115] per month in price increases, which is higher than the $30 they would receive).
> The policy could be put in place as soon as countries totaling more than 60% of global emissions agree on it. Countries that would refuse to take part in the policy could face sanctions (like tariffs) from the rest of the World and would be excluded from the basic income."

In a representative survey on 3,000 respondents, Fabre et al. (2023) show that 54% of Americans support the Global Climate Scheme (GCS) as described above. Actually, Fabre et al. (2023) also run the survey on 3,000 Europeans (representative of France, Germany, Spain and the UK) and find that 76% of them support the GCS. Moreover, in a survey on 40,680 respondents in 20 countries covering 72% of global CO_2 emissions, Dechezleprêtre et al. (2022) find strong majority support in each country for such a policy.

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In this policy brief, we make the case for a Global Climate Scheme. We show that it is grounded on solid ethics and economics (Section 2), would operate a global redistribution from rich to poor (Section 3), can be implemented with current technology (Section 4), and is genuinely supported by the population across the World (Section 5). Finally, we expand on the above description and formulate a well-specified plan (Section 6).

2 Principles

The Global Climate Scheme would help achieving the internationally agreed agenda for a prosperous future. While the Paris agreement sets an unanimous climate objective, it does not establish binding rules, and current policies place the world on track to a temperature rise of 2.7°C in 2100 (Climate Action Tracker 2022). Likewise, the Sustainable Development Goals set different targets for 2030, the first one being to eradicate extreme poverty defined as living on less than $1.90 a day (in 2011 PPP), and we are not on track to achieve this target as 8% of the world population still live in extreme poverty (UN 2022). Meanwhile, the nominal GDP per capita (in 2021) is 62 times larger in high-income countries (home to 1.2 billion people) than in low-income countries (700 million), meaning that a transfer of just 1% of high-income countries' GDP would mechanically double low-income countries' national income.

By design, the Global Climate Scheme (GCS) would stop global warming at a reasonable level, eradicate poverty, and make a dent on global inequalities. It relies on four principles:

1. A cap on emissions to meet the 2°C target. The IPCC (2021) provides the carbon budget that remains to limit global warming to "well below 2°C". Defining a global emissions trajectory and imposing a yearly quota on global CO_2 emissions would ensure that they decrease in line with the target. Emissions permits corresponding to the quota would then be auctioned "upstream" to industrial units that emit CO_2 or sell fossil fuels (like refineries, coal mines, or cementeries). In short, an Emissions Trading System (ETS) would be established to control CO_2 emissions at the global level. Implemented in various countries including the European Union, China, and South Korea, and being under consideration in others like India, Brazil or Nigeria, ETSs already cover 17% of global GHG emissions. They can be successfully linked to one another, as California and Québec showed (ICAP 2023).

2. Defending the interests of people rather than nations. Although global carbon pricing has long been discussed, it has stumbled upon the allocation of emissions entitlements between countries. For example, the U.S. has historically defended the free allocation of emissions permits to emitting sources while India has insisted on the historical responsibility of industralized countries to defend a redistributive solution (Bertram 1992; Michaelowa et al. 2012). An approach centered on individuals rather than countries helps

escaping this impasse. Indeed, as shown in Section 5, there is a worldwide consensus in favor of an equal right to emit for each human. Compared to other approaches, the egalitarian allocation has the merit of simplicity and provides a clear focal point. What is more, the individual approach can also be applied to address historical responsibilities, by redistributing individual wealth rather than attributing climate debts to industralized countries. In a separate policy brief, we propose a global wealth tax that would finance low-income countries as well as carbon removal. Indeed, the best available approximation of the historical emissions of someone is arguably their wealth or, if the person died, the wealth of their descendents. Besides, ability to pay of individuals may be better suited than past emissions of countries to define fair shares of the decarbonization burden.

The GCS is a good complement (rather than a substitute) to other climate or redistributive policies (Stiglitz 2019). In particular, the GCS's negative effect on the purchasing power of an average emitter of a high-income country can be offset by national redistribution, through increased income taxes on the top 5%. Furthermore, some decarbonization costs can be mutualized, e.g. through public investments in public transportation and subsidies to thermal insulation, to reduce the discrepancy in private costs between people with similar income but different carbon footprint. The GCS actually encourages complementary decarbonization policies, as countries decarbonizing faster will contribute less to the GCS revenues than countries entirely relying on the price mechanism.

3. A global basic income that eradicates extreme poverty. The GCS revenues would be used to finance a global basic income. At their peak, assuming a carbon price of \$90/tCO_2 in 2030, the GCS revenues are estimated to amount to 1.7% of the Gross World Product, including 1% in international transfers (see Section 3). We use the price and emissions trajectories from the report by Stern & Stiglitz (2017) and estimate that the basic income would amount to \$30 per month for each human above 15 in 2030, enough to lift out of extreme poverty the 700 million people who live with less than \$2.15 a day. Conversely, high emitters like a typical German (with median German CO_2 emissions) would lose in net €25 per month, as they would face €55 per month in price increases.

Although distributing a basic income to every human is technically challenging, different options are available, reviewed in Section 4.

4. A climate club to foster global cooperation. Building on insights from game theory (MacKay et al. 2015; **?**), the GCS should be launched by a club of willing countries, with carbon border adjustments and possibly sanctions on non-participating countries, to foster compliance by most countries. The GCS would be implemented as soon as 60% of global CO_2 emissions are covered by the parties. This threshold can be met by the union of China (30% of global emissions), the U.S. (15%), the EU (9%) and India (7%); or, if the U.S. do not participate, by the countries that would gain from the GCS (21%, including India), China, the EU and the UK.

3 Distributive effects

The GCS would redistribute income from high-emitters (people with a carbon footprint higher than the world average) to low-emitters. Indeed, polluting firms would pass on the carbon price to consumers, who will ultimately pay higher costs in proportion to their carbon footprint. The basic income amounts to the global average revenues per capita and would thus equal the carbon price times the global average carbon footprint.

Currently, countries' footprints are strongly correlated (at .64) with their GDP per capita. But certain countries, like Iraq, South Africa or China, have a carbon footprint higher than predicted by their GDP per capita. In addition, it might be the case that around 2050, countries like the EU will reach very low carbon footprint, perhaps lower than some developing countries like India. EU's footprint is currently 4 times higher than India's, so it would take time before a reversal can happen between the two. Still, Section 6 proposes a solution to prevent the GCS from redistributing from lower income to higher income countries.

Figure 1: Estimated trajectory of CO_2 emissions, carbon price and basic income.

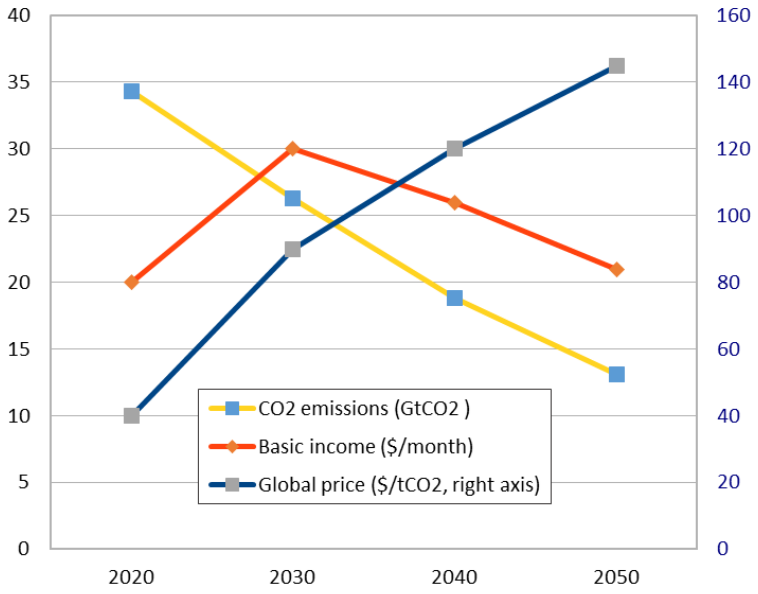
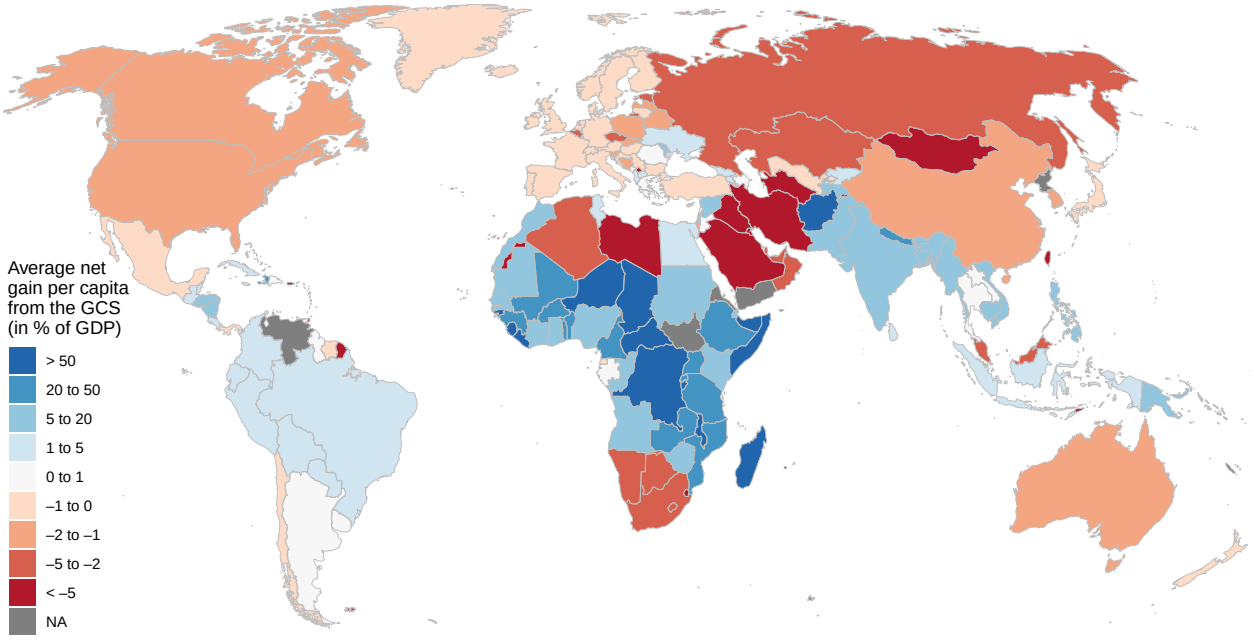


Figure 2: Net gains from the Global Climate Scheme.



How we compute the distributive effects To specify the GCS, we use the IEA's 2DS scenario (IEA 2017), which is consistent with limiting the global average temperature increase to 2°C with a probability of at least 50%. The paper by Hood (2017) contributing to the Report of the High-Level Commission on Carbon Prices (Stern & Stiglitz 2017) presents a price corridor compatible with this emissions scenario, from which we take the midpoint. The product of these two series provides an estimate of the revenues expected from a global carbon price. We then divide it by the UN median scenario of future population aged over 15 years (*adults*, for short) to derive the basic income.
To estimate the increase in fossil fuel expenditures (or "cost") in each country by 2030, we make a key assumption concerning the evolution of the carbon footprints per adult: that they will decrease by the same proportion in each country. We use data from the Global Carbon Project (Peters et al. 2012). Finally, the net gain is given by the basic income ($30 per month) minus the cost. We have checked that the emissions per capita given by our method are broadly in line with alternative methods, even if it tends to overestimate net gains in countries which will decarbonize less rapidly than average.

4 Implementation

In addition to geopolitical challenges, implementing the GCS would face two technical challenges.

First, carbon emissions must be monitored, reported and verified, at least for large industrial units such as coal mines or oil refineries. This might prove difficult in countries

lacking a well-functioning administration. Yet, this challenge is not specific to the GCS as controlling emissions is a necessary element of any successful climate policy. Actually, the control of emissions is likely to be facilitated by the GCS compared to alternative climate policies, given that the GCS would provide resources to low-income countries (which they can use to expand their administration) and make countries work together (so that experienced countries would assist the others).

Second, the basic income needs to reach everyone and be robust to fraud (so that no one receives the basic income twice). It is difficult to reach people without a proper civil status or living in remote areas. Likewise, it is difficult to verify people's identity and to be confident that they are not registered multiple times. However, there are good reasons to be confident that the required infrastructure to deliver a basic income can be deployed within ten years, as there exists different technical solutions are available. First, most countries maintain electoral lists and already have social programs targeted to isolated people. Second, smartphones now provide biometric identification as well as a costless means of transaction (and the cost of a smartphone would be covered by just a few months of basic income). Third, while many places are still lacking internet access, progress is rapid in satellite internet access, and it might soon become cheap and ubiquitous (Hanson 2016). Fourth, experience can be gained from the Aadhaar system, launched in 2009, which now provides to 99% of the Indian adult population a unique biometric identifier. Aadhaar is linked to one's bank accounts and used to distribute welfare benefits. Although the technical challenge remains, it seems solvable by an appropriate combination of these solutions, tailored to the specific needs of each region.

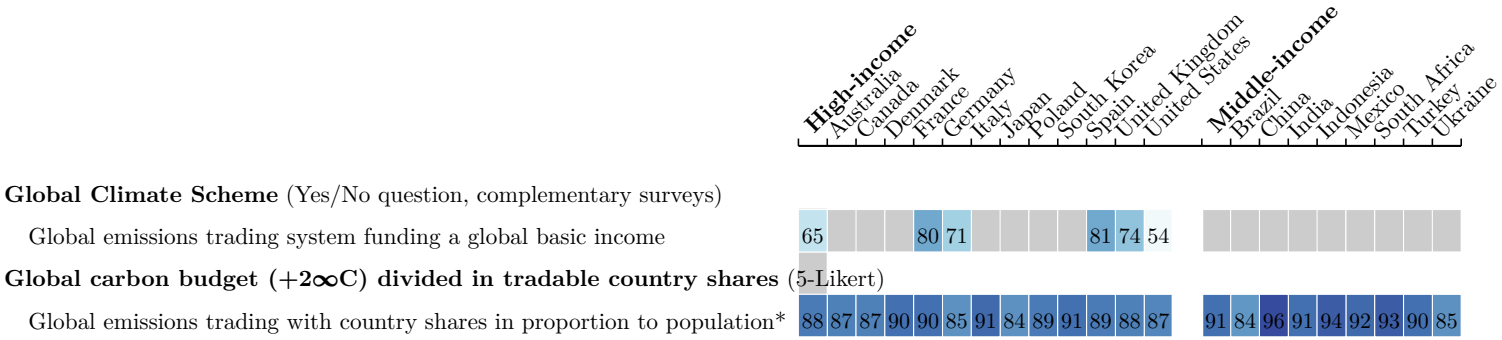
5 Support

Fabre et al. (2023) run representative surveys in 20 countries covering 72% of global CO_2 emissions and find widespread support for the GCS in each country.

In general, 70% (in the U.S.) to 94% (in Japan) choose the global level as an appropriate scale at which to enact climate policies. Meanwhile, the European level is chosen by less than half of the European respondents while the federal level is chosen by only 52% of U.S. respondents, and national or local levels are chosen by even fewer people. It is therefore not surprising that 50% (in Japan) to 78% (in China and India) support the principle of a global emissions trading system. Interestingly, with at least 84% support in every country, there is a global consensus for a global ETS that allocates emissions permits in proportion to the population of countries, consistent with an equal right to emit for each human. This solution is preferred in every country to alternative allocations, like more rights to emit for countries that emitted less in the past (*historical responsibilities* is the second-most preferred option overall), or for countries that currently emit more (*grandfathering* is the least preferred option everywhere).

To assess the robustness of the public support found in the 20 countries, Fabre et al. (2023) run complementary surveys on 3,000 U.S. respondents and 3,000 European ones (in France, Germany, Spain, and the UK). They describe the GCS as in Section 1, detailing

Figure 3: Support for the Global Climate Scheme around the World (in percent).



the negative effects on the respondents' purchasing power. Despite its costs being made salient, the GCS still obtains majority support of 54% in the U.S. and 76% in Europe. Using a technique called list experiment, they further show that the support is genuine and not driven by a potential social desirability bias. Actually, a majority of people in each country is willing to sign a petition in favor of the GCS, knowing that the share of respondents willing to sign will be transmitted to the head of State's office.

The most compelling evidence showing that the support for the GCS is profound, is that a progressive candidate may win voting shares by endorsing it. Fabre et al. (2023) show this using different questions. First, they present a progressive and a conservative platform, frame the choice as the next election, and ask respondents which candidate they would vote for. Adding the GCS to the progressive platform in a random half of the sample, they show that the progressive candidate would win 11 points in France by endorsing the GCS. In the U.S., the progressive candidate could win 3 points (the p-value is .13) and in the other countries, the effect is not significantly different from zero(even at the 20% threshold). Second, they draw two political platforms at random from a pool of (rather progressive) policies, and then add the GCS to one of the platform. In Europe, respondents are prompted to imagine that a left- or center-left coalition will win the next election and are asked what platform they would prefer that coalition to have campaigned on. In the U.S., the question is framed as a hypothetical duel in a Democratic primary, and asked only to non-Republicans. The platform containing the GCS is preferred by a majority (from 58% in the U.S. and the UK to 64% in Spain). Finally, using a question asking respondents to allocate 100 points to express their support to different policies, Fabre et al. (2023) show that the GCS is more prioritized than the average policy and is among the most preferred climate policies, while a policy enacted in the EU and California (phasing out new combustion-engine cars) is one of the three least prioritized policies in each country.

6 Details of the scheme

Some points remain to fully specify the GCS: its timeline, scope, framework, governance, market design, and participation mechanisms.

Timeline The GCS can be put at the agenda in the UNFCCC and the G20, aiming at a gradual phase-in between 2030 and 2035. During the negotiation and preparatory phase (before 2030), it is crucial to ask people around the world whether they would like to receive a basic income and survey their potential. Indeed, each community should have the right to opt out of the basic income (or receive it in a different form, for example as a transfer to the village rather than to individuals), to avoid disrupting social structures. Furthermore, the basic income should begin with very low amounts to make sure that its delivery runs smoothly. Indeed, the redistribution operated by the basic income would lead to an increased demand for (and a higher price of) basic commodities. Despite the inflation, the basic income would increase low-income people's purchasing power, but it is important to make sure that everyone who wants it receives the basic income and to leave no one behind.

Scope The GCS would regulate exclusively CO_2 emissions. Although similar policies can be designed to regulate other substances, it is more suited to treat the CO_2 separetely to better handle its specificities. Ideally, the GCS would cover all CO_2 emissions, though it may be more practical to initially limit it to CO_2 from fossil fuels and cement production in large industrial units (i.e. the same scope than the EU ETS and ETS2 combined). The GCS should also cover emissions from international shipping and aviation.

Framework The international treaty instituting the GCS should specify some non-modifiable elements, including its scope, the use of its revenues, its rules of governance, and the carbon budget. The carbon budget should be defined by an interpretation of the Paris agreement's objective of "Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels". A possible interpretation is that we aim for a long-term temperature of +1.5°C but allow an overshoot up to +2°C. This would define a carbon budget of 500 $GtCO_2$ starting in 2020 (IPCC 2021), translating into the GCS's carbon budget by subtracting emissions occurring between 2020 and the launch of the GCS. The full trajectory, including the negative emissions allowed, could then be chosen in accordance with the maximum overshoot target and up-to-date understanding of the climate system. A more flexible interpretation might be used if we consider a stricter one unattainable (given the current emissions of 41 $GtCO_2$ per year), such as limiting global warming to +2°C with 83% probability (entailing a budget of 900 $GtCO_2$ from 2020) or with 67% probability (1150 $GtCO_2$).

If some countries do not participate in the GCS, the GCS's carbon budget would be adjusted downard on the basis of an equal right to emit for each human adult (thereby

leaving the same rights to emit to non-participating countries).

Governance The governing body of the GCS would define the yearly emissions quota (in line with the GCS framework), the market design, and possible sanctions against non-participating countries. The choice of sanctions would be the most political decision of the body. It would mostly affect powerful countries, as they are the main geopolitical actors, and the ones that the sanctioned countries might target in possible retaliations. Besides, the ETS would directly affect participating countries according to their emissions. Therefore, it seems legitimate to grant each country a voting right proportional to its carbon emissions, at least for decisions pertaining to the ETS or sanctions. For decisions relative to the basic income, each country would have a voting right proportional to its adult population. When the body has to choose between several options, it should use approval voting, and when these options are numeric, use the median preferred values. Finally, each country should be allowed to have multiple representatives, to choose how its representatives are appointed (possibly through elections) and how they share the country's voting rights.

Market design The compliance period to surrend emissions permits should be one calendar year, and the quota should be adjusted each year. Carbon offsets should not be allowed as a substitute to surrender emissions permits. Borrowing and banking emissions permits should be limited in time and quantity to avoid speculation.

Participation mechanisms The basic participation mechanism, which would also prevent carbon leakage, is a carbon border adjustment: non-participating countries would face a tariff on the goods it exports to participating countries according to the emissions embodied in these goods (or according to a worst-case benchmark if these emissions cannot be measured). The carbon price applied to such exports would be at least equal to the market price. The governing body could decide to apply a higher price, on two grounds. First, if non-participating countries (with higher-than-average carbon footprint) joined the GCS, the GCS's carbon budget would grow less than the set of regulated emissions, so the market price of carbon would rise. The carbon price should be equal (all over the world) to that higher level to respect the carbon budget. Therefore, the carbon border adjustment could be set at (the estimated value) of that *counterfactual price*, to internalize the price that participating would have to pay for these imported goods if the GCS was truly global and the carbon budget respected. Second, the governing body could decide to apply sanctions in the form of a tariff higher than the counterfactual price.

Although high-income countries have the ability and the duty to help low-income countries decarbonizing and alleviating global poverty, this responsibility does not seem to apply to countries around the world average income per capita (*average countries* for short). Yet, some average countries like China have a higher-than-average carbon footprint. To encourage such countries to participate in the GCS, we could introduce allow them to opt out from the mutualization of revenues and the basic income under certain

conditions. To be authorized to fully opt-out and retain the auction revenues collected on its territory, a country should have a GNI per capita below the world average.[1] Countries richer than the average would be eligible to a partial opt-out, to the extent that their GNI p.c. is below twice the world average. For example, a GNI p.c. 70% above the average would have to mutualize 70% of the revenues from its territorial emissions, but could retain 30% of these revenues, in which case it would receive only 70% of the basic income. A potential concern with this participation mechanism is that it would give too large an advantage to large exporters, i.e. opting-out countries with territorial emissions subtantially larger than their carbon footprint. Indeed, these countries would retain revenues corresponding to their net exports of carbon emissions, making the basic income lower than the average increase in individual expenditures (in countries that do not opt out). However, note that the carbon border adjustment enacted by the EU gives the exact same advantage to foreign exporter countries with an internal carbon price equal to the EU-ETS price: imports from these countries would be exempted from the carbon border adjustment, and these countries would benefit from carbon price revenues eventually paid by European consumers. Still, we can limit the opt-out advantage, for example by establishing a limit on the revenues (per adult) that can be retained, e.g. at 50% above the average global revenues. Besides, the advantage to opt-out could be granted in exchange for some condition, such as the participation to a global wealth tax with a share of the revenues pooled to finance low-income countries.

Conversely, some high-income countries might have a lower-than-average carbon footprint in the future, especially in 1.5°°C-trajectories (this would occur around 2050 in the SSP1-1.9 scenario according to van Vuuren et al. 2017). To prevent the GCS from entailing transfers from higher income to lower income countries, a clause could specify that high-income countries cannot receive the basic income if their emissions per adult are lower than the global average. To avoid threshold effects, the basic income received by a country with a GNI p.c. above 2 times the world average and territorial emissions below 1.3 times the average of (non opting-out) participating countries could be a declining function of these two variables, so that a carbon-nautral country 2.2 times above the GNI p.c. average would no longer received the basic income.

Sanctions If the governance body finds it appropraite to encourage participation, it could vote sanctions against non-participating countries, such as tariffs (beyond the carbon border adjustment), assets forfeiture, or travel restrictions (especially on the target countries' elites).

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