

White paper

The *Green Impact Fund for Transformation* (GIFT) is a proposed market-based mechanism to support efficient reduction of greenhouse gas emissions in developing countries. We are seeking your views and comments, including on the feasibility and the value of such a fund. Thanks to extensive input from many individuals, this discussion of the GIFT is substantially revised as of April 2023.

0. Executive Summary

For effective climate change mitigation, developing countries must be active participants. While many high-income countries have put in place first incentives to reduce greenhouse gas (GHG) emissions – including carbon taxes, regulatory measures, and subsidies –, the same incentives are absent in most low- and middle-income countries. Even when firms want to employ green technologies, the combination of limited budgets and vigorous competition from rivals using lower-cost, emissions-intensive technologies may make it financially infeasible. This is problematic for the global effort to mitigate climate change since it is in low- and middle-income countries where the highest growth rates in GHG emissions are anticipated.

The Green Impact Fund for Transformation (GIFT) is proposed as a way to support the reduction of emissions in low- and middle-income countries. The GIFT would reward such reductions, with payment based on verification. Financed by a coalition of High-Income Countries (HICs), the GIFT would offer a competitive payment for emissions reductions in developing countries. The GIFT could have segregated funds for different types of investments; for example, there could be separate budgets for renewable electricity generation, reductions in industrial emissions, carbon removal, and agricultural practices.

While the GIFT could, in principle, operate at a very large scale, it could be piloted at a smaller scale, *e.g.* in a selected region and with preselected investment types over a 2-year period. With preparation and assessment, a meaningful pilot could be completed from up to \$20m a year over four years.

1. Introduction

As the IPCC's Sixth Assessment Report shows, the world needs "immediate, rapid and large-scale reductions" in the emission of greenhouse gases. To this end, established green technologies must be deployed on a global level, and new innovations developed. One challenge is that low-emissions technologies are often more costly to implement than high-emissions technologies: the additional cost is sometimes referred to as a "Green Premium."

In many affluent countries, Green Premiums are addressed through stringent environmental regulations, taxes on emissions, and green subsidies, which encourage the choice of low-carbon technologies by prohibiting, limiting, or penalizing the use of their dirtier alternatives. This has the effect of encouraging businesses and individuals to choose low-carbon alternatives. Such compensatory measures are largely absent in less affluent countries because of political challenges, fear of competitive disadvantages, and the lack of unified global standards. Therefore, incentives to adopt green technologies and production methods tend to be weak in developing countries.

The failure to support the adoption of low-carbon choices in developing countries will have major consequences: in the remainder of this century, developing countries are expected to experience substantial industrial growth, intensified by large increases in population in some countries. The technologies used, the practices and habits formed, and the path taken in developing countries will matter as much as the choices affluent nations make within their own borders. Rapid emissions reduction requires that highly effective and locally appropriate low-carbon technologies be widely and quickly deployed throughout developing countries. The GIFT is designed for exactly this purpose.

Financing is one of the key obstacles to the uptake of low-carbon production in developing countries.¹ The GIFT could provide meaningful complementary support for firms or governments that sought to invest in low-carbon operations. With a committed source of revenues from the GIFT, firms would be better able to attract financing.

In addition to the effect that massive amounts of GHGs are released into the atmosphere due to the lack of appropriate incentives, poor global utilization of new technologies also undermines upstream incentives to invest in green R&D. We must address this problem to promote successful global technology development and adoption.

This discussion paper shows how a new system of rewards can complement the existing carbon policies to support low-carbon choices and to encourage rapid uptake of low-carbon technologies in production and consumption.

2. Operation of the GIFT

The [Green Impact Fund for Transformation](#) would invite potential participants – usually firms – to compete to receive payments for qualifying low- and zero-carbon projects in developing countries. The participants would become eligible for payments from the GIFT, based on the assessed reductions in emissions attributable to the project. Additionality could be assessed in a way that is appropriate to each field of technology.

Payments would be competitive, with a fixed total payment divided by the number of tCO₂e (tons of CO₂-equivalent gases) averted. Thus, the payment per tCO₂e would be endogenous, and would therefore reflect the competitive cost to reduce emissions. There should also be a cap on the payment

per tCO₂e, which we think could be set at approximately \$25, below the generally accepted social cost of emissions.² The GIFT would enable projects that require long lead times – such as renewable electricity generation facilities or industrial redesign projects – to lock in a payment per tCO₂e; having certainty over this payment would support them in obtaining financing. The design of the GIFT auction mechanism is described in more detail in Section 3.1 below.

The GIFT should be open to projects in all countries with an income below a given threshold. We propose that this “GIFT Zone” threshold would be \$10,000 gross national income per capita, as estimated by the World Bank.³ The proposed threshold is relatively high because many middle-income countries are important industrial producers but currently lack the kinds of incentives, such as carbon taxes, that are required to drive the adoption of green technologies.

Funding for the GIFT should be provided by high-income countries, which have an equal interest in emission reductions anywhere in the world. Although the GIFT is targeted at developing countries, its effects benefit the planet on a global level. The GIFT also fits the [Paris Agreement](#)’s framework for financial, technical, and capacity-building support for developing countries. Furthermore, it fosters capacity-building by rewarding the development, manufacture, installation, and use of appropriate low-carbon technologies in developing countries. This shifts a higher share of the (industrial) value chain to those countries and hence contributes to sustainable development, economically, socially, and environmentally.

2.1 Efficiency

The GIFT creates strong incentives to adopt the most cost-effective emission reductions. With the help of GIFT rewards, stakeholders in developing countries are incentivized to adopt green technologies that they would not be able to afford otherwise, and thus enhance the demand for such technologies. However, the GIFT uses competition to enable it to make the lowest payments necessary to support emissions reductions, so that a fixed budget can achieve the greatest benefit.

The GIFT differs substantially from the strategy of subsidizing specific projects based on proposals. We can broadly categorize mechanisms that support investments into “push” and “pull” mechanisms. Push mechanisms grant a subsidy to facilitate investment; Pull Mechanisms reward investments that deliver desired results. The benefit of push mechanisms is that they help to overcome liquidity constraints, which are common in developing countries. Unfortunately, they often fail to deliver the promised results and usually require substantial up-front costs in assembling grant proposals and assessment of the likely benefits. The benefit of pull mechanisms is that they only reward success based on the assessment of the achieved benefits and are open to all players who can deliver the desired results.

2.2 Feasibility

The GIFT mechanism builds upon the extensive experience with voluntary carbon credit markets. Companies that are seeking to offset their emissions purchase carbon credits that are verified through several existing organizations using well-established standards. Volume in voluntary offset markets is currently about \$500m annually and is set to grow substantially. Notably, airlines will be required to [purchase carbon credits to offset any increases in emissions from international flights](#) above 2020 levels, starting in 2027. Airlines in many countries are already participating on a voluntary basis.

Carbon offsets are often seen as unhelpful as they legitimize a carbon-emitting activity, such as international air travel, to be justified by an emissions reduction elsewhere. This is particularly undesirable if the emissions reduction exists only on paper (which may occur when verification is faulty). The GIFT mechanism, however, is not an offset mechanism. It merely uses the same mechanism to identify and support emissions reductions. In effect, it would create a centralized, standardized market offering a price at which emissions reduction activities in developing countries would be subsidized.

One effect of the voluntary carbon market is that there is extensive existing experience with carbon credits. Moreover, TUEV SUED, an international technical inspection association based in Germany, has expressed its support for the GIFT mechanism and states in a [supportive letter](#) that “in summary, assessment of emissions averted through the deployment of new green technologies is feasible. TUEV SUED and similar organisations already have the pertinent practical experience needed for such an effort.”

2.3 Cost Control

The GIFT limits cost by means of a fixed annual budget and secures cost-effectiveness through competition among a variety of ways of reducing emissions. The administration of the GIFT could be established within a UN Organisation that already deals with technology deployment like UNIDO’s [Global Cleantech Innovation Program](#) or the Green Climate Fund which is [mandated](#) to provide “support to developing countries to limit or reduce their greenhouse gas emissions.”

The size of the budget would naturally depend on the willingness of countries to finance the GIFT. However, a reasonable strategy is to build the GIFT up from a small base. This would allow it to be tested and refined. A minimal size might be in the range of \$20m per year as a pilot, which would allow it to fund numerous projects in a small set of countries. With additional experience, and subject to demonstrating cost-effectiveness, the GIFT could be scaled up to the range of billions of dollars. It is important to recognize that wealthy countries have already committed to \$100bn a year in financial support for mitigation and adaptation in developing countries; complementary to other mechanisms, the GIFT could be one mechanism for distributing this support as efficiently as possible.

A reasonable strategy for testing out the GIFT would be a pilot focused on emissions reductions in Africa. The Africa Carbon Markets Initiative was launched at the COP27 in November 2022 to encourage the sale of high-quality carbon credits from Africa. The continent was estimated to have captured a

share of only about [11% of all credits between 2016 and 2021](#), with room for growth. This initiative was able to secure commitments to buy \$200m of credits from several large corporations, but there is a need for much more support for low-carbon projects in Africa. The GIFT could collaborate with the Africa Carbon Markets Initiative as a way to support emissions reductions in Africa. (Of course, unlike the standard offset mechanism, it would not permit purchasing countries to increase their own emissions.) India and Indonesia are plausible alternative pilot countries.

2.4 Effect on innovation

The GIFT could substantially increase the demand for green technologies in developing countries. In turn, this would enhance the incentives for innovators to invest in the development of technologies appropriate to the needs of those countries. While most green technologies are universal in application, there are also some with very local or regional relevance. For example, copper mining and processing are substantially undertaken in developing countries without carbon taxes. As a result, the incentives to invest in developing emissions-reducing technologies for the sector are weak. With the GIFT, the willingness to invest in purchasing green technologies for this sector would be enhanced. Moreover, because the GIFT would only pay out based on assessed reductions in emissions, it would encourage innovators to focus on ensuring the practical effectiveness of their innovations.

2.5 Fairness

The GIFT would ensure ample rewards to participating firms, support developing countries in their green transformation, and reduce the dangers of climate change for all. At the same time, the budget of the GIFT should largely be borne by HICs that promised [\\$100bn](#) annually for climate adaptation and mitigation efforts of LMICs.

Thus, the GIFT would deliver on the principles of climate justice, namely the 'polluter-pays-principle', the 'ability-to-pay-principle', and the 'right to develop' which are all crucial to combine efforts to align measures for effective climate protection and the Sustainable Development Goals (SDGs). The GIFT advances sustainable industrial and technological development in low-income countries (SDG9), could immediately mitigate emissions to reduce climate change (SDG13), including through helping to support access to clean energy (SDG7) while strengthening international partnership (SDG17). At the same time, the GIFT would support countries in achieving their Nationally Determined Contributions toward mitigating climate change.

3. Design Options

3.1 Auction mechanism

The GIFT would hold, for each investment category, an annual auction. Potential participants could enter the auction by submitting a "price" and quantity. The price would indicate the minimum payment per tCO₂e averted that they would be willing to accept for the indicated quantity. For example, a firm might

enter a bid of \$10 for 100,000 tCO₂e. For each investment category, the GIFT would have a fixed budget available (for example, \$50m) and a maximum acceptable price. At the closing of the auction, the GIFT would rank all bids by price, starting at the lowest price, effectively creating a supply schedule. It would then set the payment per tCO₂e equal to the highest price at which it would use up its budget by accepting all bids below that price. For example, if there were three bids, each for 1m tCO₂e, priced at \$9, \$10, and \$12, and its budget was \$20m, it would accept the two lowest bids, paying each \$10 per tCO₂e. (For clarity, the GIFT would pay the highest successful bid price to all bidders, not the price as bid by each participant.)

Formally this is a uniform price auction, as used in many electricity markets globally, in which firms bid both price and quantity.⁴ This auction design is effective for inducing honesty from participants about the price they are willing to accept.⁵ It differs from the standard electricity market since price in this case is determined by a global budget ceiling rather than by a demand curve. A graphical illustration is presented below.

The supply schedule (in black) shows the bids, ranked by bid price. When the budget is small, it allows only for the first two bids to be accepted, resulting in price p_L for all bidders. If the budget is large, the first four bids can be accepted, resulting in price p_H . Notice that in both cases, the budget is not fully used up as the budget amount is larger than the actual sum of payments. However, there is not enough money in the budget to fully fund the next project. In general, any leftover monies would likely be small relative to the total budget, and they could be rolled over to augment the following year's budget.

Payments would not be made immediately to the proponents; instead, payment would depend on the proponent completing the project and the projected emissions target being met. If the proponent failed to achieve the projected emissions reductions, the payment would be based on the rate per tCO₂e times the achieved tCO₂e. This would generally require the proponent and the GIFT to agree on a timeline for achievement of the emissions reductions. The payments from a single year's auction might therefore be staggered over many years.

An important feature of this mechanism that distinguishes it from existing carbon offset markets is that it allows firms to know a committed price for any achieved carbon reductions from a project before they invest in the project. The payments under the auction would then be helpful for them in seeking additional financing that might be needed for the project. In order to eliminate frivolous bids for projects unlikely to be realized, the GIFT could require a small but meaningful deposit or bond by the project proponent as a condition for acceptance of a bid.

3.2 Investment categories

In principle, the GIFT could be open to any method of reducing emissions. Experience with the Clean Development Mechanism (CDM) shows, however, that additionality is easier to identify in some cases

than in others. For example, carbon capture and storage is generally entirely additional, while new electricity generation might not be. The additionality of changes in agricultural practices such as introducing biochar may also be uncertain. It might be appropriate, in these circumstances, for the GIFT to have separate auctions for separate categories of investment. This would likely result in different prices across the different categories, which could imply inefficiency – why would the GIFT want to pay more for reducing carbon emissions in one way than another? – but may also be desirable since otherwise investments in one field are likely to drive out those in others.

3.3 Funding

The GIFT should be large enough to justify the costs of administration and impact assessment. Should it work well, it could be expanded to support an increasing portfolio of projects. There is an obvious funding source in the pledge of \$100bn annually.

While the GIFT could be funded by a single country, if international cooperation in funding exists, one reasonable way to establish contribution requirements would make them proportional to [population times (income per capita minus \$10000)]. In that case, countries with income below \$10,000 per capita (lower-middle-income and lower-income countries) would not contribute. Countries with higher average income would contribute at a higher rate relative to their gross national income.

3.4 GIFT Zone Countries

In which countries should projects be eligible for carbon credits under the GIFT? A reasonable approach is to limit the GIFT Zone to countries with income per capita less than about \$10,000. If this threshold were higher, the GIFT would require greater annual funding; moreover, the funding countries might have increased concerns that they were assisting industrial competitors. This range of countries includes many upper-middle-income countries that are important contributors to GHG emissions globally and important manufacturing locations, as well as low-income countries that have much less industrial development.

3.5 Administration

Assuming that the GIFT is financed by many countries, the most plausible administrative entity would be the Green Climate Fund, established under the Cancún Agreements in 2010 as a dedicated financing vehicle for developing countries within the global climate architecture, serving the Financial Mechanism of the UNFCCC and the Paris Agreement. However, it is also possible for a single country such as the United States, or a single region such as the European Union to finance the GIFT, in which case the funder would presumably also control the administration.

3.6 Should there be a threshold for emissions?

Bill Gates has argued that rather than rewarding incremental reductions in emissions, we should focus on technologies with net zero emissions.⁶ One possible design choice for the GIFT would be to limit eligibility to projects that reduce emissions by at least 90%. This would encourage “radical” innovation that would have long-term effects. Such a limitation would, of course, shrink the pool of possible projects and therefore make the GIFT less internally competitive.

4. Measuring Additionality

The key challenge for the GIFT is the exact measurement of the effects of a given innovation. This is not a problem specific to the GIFT, since all carbon credit schemes must address it. The Clean Development Mechanism (CDM), discussed below, has issued carbon offset credits for over 2bn tCO₂e averted. The GIFT aims to pay for a smaller set of possible emissions reduction projects, but the core issues of assessing additionality are similar. The International Carbon Reduction and Offset Alliance has produced a Code of Best Practice, which could form a starting point for assessing the effects of using a specific technology. GoldStandard.org offers a set of methodologies to assess GHG reduction for various types of projects, which show both the challenges of assessment as well as its feasibility.

One important area of emissions reduction is the rapid growth of renewable electricity. The rapid decrease in the levelized costs of wind and solar electricity is making them highly competitive, but that also makes it difficult to identify whether a given renewable energy project is “additional”. In the long run, building out renewable energy rapidly may discourage the construction of new fossil electricity sources or may encourage their more rapid retirement, but showing clear causality is likely to be challenging. At the same time, many developing countries are energy poor and desperately in need of additional electricity generation. In these circumstances, it might be reasonable to use the GIFT mechanism to reward the construction of renewable power generation even when it is difficult to demonstrate clear additionality.

5. Carbon taxes and other GHG mechanisms

5.1 Carbon Taxes

The GIFT performs a function similar to that of carbon taxes, by making emission-intensive production methods relatively costly. If carbon taxes were so high as to fully cover the social cost of CO₂ emissions, there would be no need for the GIFT. However, existing carbon taxes in developing countries are - and are likely to remain - well below estimates of the social cost of carbon, so additional incentives to reduce emissions are desirable. Moreover, it is politically difficult to implement carbon taxes, even in high-income countries, and so some alternative financial incentives are needed.

5.2 The Clean Development Mechanism (CDM) and Offsets

Established as part of the 1997 Kyoto Protocol, the CDM allowed emission reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of

CO₂ per year. These CERs could be traded and sold, and used by industrialised countries to meet a part of their emission reduction targets under the Kyoto Protocol. The volume of CERs issued since initiation exceeds 2bn tons. (For scale, global emissions currently are around 50bn tons of CO₂e annually.) The CDM's purpose was clear: if emissions reductions can be done more cheaply in developing countries than in HICs, then firms in HICs can achieve equivalent reductions in emissions at lower total costs by buying credits from developing countries. The CDM, however, has attracted considerable criticism since if emission reductions are not "additional" (i.e. occurring only because of the CDM), then the effect is that the HIC can increase its emissions without a real matching reduction in developing countries that sell the credit. In this case, there is simply a transfer of money to the developing country as a payment for the credit, but no restraining effect on total global emissions. In effect, the CDM resembled a carbon tax with payments flowing to those developing countries that were able to establish a mechanism to measure emissions "reductions". At a price of about \$20 per ton, the CER market represented a meaningful source of income in some countries. Given declining demand and excess supply, prices of the CERs collapsed in 2012. By 2019, the price range had fallen to US\$0.15 - \$0.24 per tCO₂e. Numerous other offset mechanisms allow for the transfer of "credits" from one party to another.⁷ The experience from these mechanisms generally suggests that to be effective, "integrity of carbon credits must be maintained to provide confidence to purchasers that the credits accurately represent genuine and real emission reductions." (World Bank 2020, p. 49)

The GIFT differs from the CDM mechanism in three important ways. First, it is designed to reduce emissions, rather than offsetting increased emissions in one country with decreased emissions in another. Second, the auction mechanism can provide certainty about the payments that will be made for projects that are still under development, unlike standard offsets that have unknown future prices. Third, the business of certifying and assessing emissions reductions has matured, and there is now much more attention paid to whether emissions reductions are additional, permanent, do not suffer from leakage, and are well validated.⁸

6. Why should high-income countries fund the GIFT?

High-income countries should finance the GIFT above all for the same reasons that they have already committed to substantial climate financing for developing countries: they have benefited from their historic GHG emissions on the path to wealth, and so it is just that they should assist developing countries to reduce their own emissions. Moreover, high-income countries have much more financial capacity to support the reduction in emissions than do developing countries. Notably, supporting emissions reductions is very different from "aid" – it is very much in the interests of high-income countries that emissions be reduced everywhere since emissions anywhere have exactly the same effect on the global climate. The predominant model of investing in emissions reductions "at home" is good since that is where the reductions should start. But it is not enough. If relatively wealthy countries do not support poorer countries in emissions reductions, then everyone will suffer for it.

The question then becomes, why is the GIFT an appropriate mechanism for emissions reduction support? Its chief merit is that it is competitive, transparent, and open. The alternative ways of providing climate finance require proponents to bring a project to a bilateral or multilateral funder, which then decides whether it deserves funding or not. Essentially, this is a “grant-based” approach. For many projects, grants are appropriate. But there are problems with the grant-based approach. First, it rewards applicants who have the right contacts and skills to make a strong application, rather than those with a project that they believe is strong. Second, it inevitably faces risks of biases on the part of the committee making funding decisions. Such biases might be cultural or might relate to technological preferences. Third, the process may be seen as paternalistic in nature if decisions are made by a group of experts mainly from high-income countries. In contrast, the GIFT mechanism is open and can reward any project that achieves qualifying reductions in carbon emissions. That leaves space for alternative approaches that may be preferred by the proponents. Of course, since payment depends on performance, the risk of failure is borne by the proponents, so the increased autonomy offered by the GIFT is not without costs.

The Climate Club model has developed considerable momentum, and the GIFT is highly complementary. In a climate club framework, the expectation is that cooperating countries would implement ambitious mitigation policies, such as carbon taxes, which high income countries have more capacity to do. The G7 statement on the climate club also notes that one of its three pillars is “Boosting international ambition through partnerships and cooperation to encourage and facilitate climate action and unlock socio-economic benefits of climate cooperation and to promote just energy transition.”⁹ Facilitating climate action requires meaningful financial support of developing countries and the GIFT offers a market-based mechanism that would transparently enable climate action.

7. Summary

The Green Impact Fund for Technology offers an important opportunity to use a market-type mechanism to support the reduction of carbon emissions in low- and middle-income countries. Unlike other approaches, it could effectively employ a market-based mechanism to ensure that support for climate mitigation was well targeted. Moreover, it imposes risks of performance on project proponents, so that the right incentives are in place. And unlike carbon credits, it is designed to allow project proponents to know before they invest how much they can expect to earn.

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1. See [Finance for Climate Action: Scaling up Investment for Climate and Development](#). Report of the Independent High-Level Expert Group on Climate Finance, November 2022. ↩
 2. Ricke, K., Drouet, L., Caldeira, K. *et al.* Country-level social cost of carbon. *Nature Clim Change* 8, 895–900 (2018). <https://doi.org/10.1038/s41558-018-0282-y>. ↩
 3. See https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?most_recent_value_desc=false for a list of countries with corresponding per capita GNI. ↩

4. See for example Cramton P, Stoft S. Why we need to stick with uniform-price auctions in electricity markets. *The Electricity Journal*. 2007 Jan 1;20(1):26-37. ↩
5. Specifically, when the market is competitive and a firm cannot influence the uniform price, the best strategy for a participant is to bid its actual willingness to accept. ↩
6. Bill Gates, *How to Avoid a Climate Disaster: Solutions We Have and the Breakthroughs We Need* (Alfred A. Knopf, 2021). ↩
7. See World Bank, 2020, Chapter 3. ↩
8. See, for example, Franki N. Regulation of the Voluntary Carbon Offset Market: Shifting the Burden of Climate Change Mitigation from Individual to Collective Action. *Columbia Journal of Environmental Law*. 2022 Dec 29;48(1):39. It is also true that there has been much criticism of carbon offsets, which has helped to clarify what is needed to improve assessment. ↩
9. See <https://www.g7germany.de/resource/blob/974430/2057926/2a7cd9f10213a481924492942dd660a1/2022-06-28-g7-climate-club-data.pdf> ↩

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