The Green Fund

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It is asking a lot to expect people with no access to electricity to help solve global problems they have not caused.

ABOUT ONE-QUARTER OF THE EARTH'S POPULATION has no access to electricity and uses fossil fuel only indirectly. It seems presumptuous to ask them to share, even in proportion to their small incomes, in solving problems that they have played no role in causing.

However, sale of carbon credits by developing countries reduces emissions ineffectually.

The Kyoto Protocol imposes no obligations on developing counties but allows them to sell carbon credits to developed countries with cap and trade. This addresses fairness, but it goes too far, as the U.S. Senate agreed when, in 1997, it passed a resolution by 95-to-0 opposing any treaty lacking obligations for developing countries. Also, as I explain in the *Kyoto: What Went Wrong* chapter, selling credits for *not emitting* leads to gaming. This makes the Kyoto Protocol ineffective and expensive.

Global carbon pricing should be adjusted so poor countries can operate with a lower carbon price than rich ones.

Global carbon pricing is more fair to begin with than emission caps are, but it too will need adjustment. Poor countries should not have to tax their low rates of carbon emissions at the same rate as wealthy countries tax their high rates of emissions, unless we give the poor countries some financial assistance. Since the enforcement mechanism of the previous chapter tends to equalize international prices, assistance is in order in the form of a Clean Development Incentive (CDI).

Clean Development Incentive (CDI) payments are based on fairness.

CDI payments are based on the twin "gold standards" of fairness described in the *Why Untaxing is Fair* chapter. One is the untax and the other is equitable cap and trade. In principle, either of these could be applied to the world, and ignoring administrative problems, they would produce exactly the same results if they were set at levels of equal strength. In both cases, high emitters would pay low emitters, and the payments would be the same.

However, complete fairness is politically unfeasible.

This policy has the strongest claim to fairness because it treats everyone in the world equally. Neither the rich nor those who pollute the most are given any special right to pollute. But this system transfers a great deal of money from high-emission nations, such as the United States, to low emission nations such as India. In fact, a $20 global carbon untax would result in a family of four in the United States paying about $1,200 per year to poor countries. This is not politically feasible.

A small CDI incentive can improve fairness and encourage cooperation by low-emission countries.

This is why I recommend primarily that countries impose their own carbon takes and keep their revenues. However by adding a relatively small Clean Development Incentive that works like a global untax and like the equitable cap-and-trade system, we can improve fairness, encourage cooperation by low-emission countries, and provide every country with an additional incentive to reduce emissions. Such a CDI can use an incentive rate that is much lower than the global carbon price and still satisfy the U.N.'s requirement that the developed and developing countries have different responsibilities. This is because the CDI generates flows of funds between countries while global carbon pricing does not.

How the Green Fund Works

The CDI is calculated on the basis of per-capita emissions.

Although the CDI is almost identical in its effects to both a global untax and to a global and equitable cap-and-trade system, it is different in one respect. It applies to countries and not to individuals. But it is still calculated on the basis of per-capita emissions.

A country with average per capita emissions would see no net flow of Green funds.

To see how it works, first consider a country with average emissions per capita (averaged over all the world's people). Under a global untax, the residents of such a country would pay the average amount of tax in total and each resident would receive a refund equal to the average amount of tax. So the country as a whole would see no net flow of funds. Similarly, under a global, equitable cap-and-trade system, a country with average emissions would not end up buying or selling any emission rights to other countries.

Countries that emit more per capita than average would contribute to the Green fund.

If, however, a county emits more than average it would pay more carbon tax than it would get back with a global untax, or it would need to buy rights from a low-emission country under an equitable cap-and-trade policy.

The CDI rate that generates the Green Fund must be set by negotiation at a climate summit.

From this we see that the CDI should transfer funds from countries with above average emissions to countries with below average emissions. This is exactly what a Green Fund does. Conveniently, once an incentive rate is chosen for the CDI, all payments to and from the Green Fund are determined without further negotiating or bickering. Like the global pricing target used under flexible global carbon pricing, the Clean Development Incentive rate that generates the Green Fund must be set by negotiation at a climate summit.

As an example of how the complete system might work, consider a global pricing target, $P^T = \$30/\text{ton}$, and a Green Fund incentive rate of \$2/ton. In order to calculate the abatement cost of the \$30 carbon price, we must assume an amount of carbon reduction, so take this to be 20 percent. These values can be used to construct Table 1.

Table 1. *Clean Development Incentive Example*

Column:	1	2	3	4	5	6
	Emissions per person	Amount less than average	Internal carbon revenue	Abatement cost of carbon tax	Green Fund income	Total cost
	tons / year		$ per person / year			
India	1	4	$30	$3	$8	−$5
Average Country	5	0	$150	$15	$0	$15
United States	20	-15	$600	$60	−$30	$90

Assumptions:

Global Carbon Price target:	$30/ton
Clean Development Incentive rate:	$2/ton
Reduction in Emissions:	20 %

This example shows that quite a strong carbon policy, implemented with flexible global carbon pricing and the CDI, would be quite cheap. Even in the United States it would cost only $90 per person per year or $0.25 per person per day. Of course, that is the average cost per person, and if countries use an untax as their method of carbon pricing, it will be much cheaper than that for the poor.

Column 1 shows the values for annual emissions per person, which are roughly right but have been rounded to make the calculations easier.

Column 2 shows how per capita emissions compare to the average. The United States is higher than average and so shows a negative value.

Column 3 shows internal carbon revenues based on $30/ton. These are in gray, because these revenues are not a social cost. All of the tax collected stays in the country and can be spent, used to reduce some other tax, or preferably, returned with an untax refund.

Column 4 reports the abatement costs of emission reductions caused by pricing carbon (for example, with a carbon tax). This calculation is explained in the *Untax on Carbon* chapter and illustrated in Table 1 of that chapter. If the percent emission reduction is *ER*, then the formula for abatement costs is:

$$\text{Abatement costs } = ER \times e \times P^T / 2$$

This is the same formula used by the U.S. Environmental Protection Agency. Division by two is required because the most anyone will pay to save carbon (because of carbon pricing) is the price of carbon, P^T, but cheaper methods will be implemented first. Note that this cost, is just something that happens as people and businesses adapt, and it is not an explicit part of the system.

Column 5 shows Green-Fund payments. Note that for a country with average emissions per capita, this value is zero. For other countries, it is calculated from three values, the Green-Fund incentive rate (G), the country's per-capita emissions (e) shown in column one, and the global average emission rate (E) of 5 tons per person. The formula is:

$$\text{Green Fund incentive payment } = G \times (E - e)$$

A negative value, such as −$30 per person per year for the United State indicates a payment to the green fund. Note that this payment has nothing to do with the flexible-carbon-pricing rules, except that it helps compensate poor countries for the burden of pricing carbon.

Column 6 is the abatement cost minus payments from the Green Fund, or for high-emission countries, abatement cost plus payments to the Green Fund.

Note that all countries are assumed to meet the global carbon pricing target of $30/ton. If some country under-collects carbon revenue by, say, $10 per person per year, and the pricing incentive rate, *Z,* is 10 percent (see Chapter 9), then that country would be required to pay an extra $1 per person, which would be distributed to countries that over-collect carbon revenue. This would not affect the Green Fund, but the country would have slightly lower abatement costs plus the additional cost of paying the pricing incentive.[1]

For completeness, here is the formula for the pricing incentive.

$$\text{Pricing incentive payment } = Z \times (r - e \times P^T)$$

The variable *r* denotes the country's per-capita carbon-pricing revenue. If the formula gives a negative value then the country must pay, otherwise it is paid. Together the two incentive formulas plus the rule for adjusting Z and a restriction on Green-Fund payments, described below, are the entire proposed international system. Of course P^T and G must be chosen by negotiation.[2]

Emissions 'exported' in finished goods are not counted for Green Fund payments.

A country with emissions slightly above average, might have a significant part of its emissions exported, for example in the form of steel, aluminum, glass and other energy-intensive exports. Taking this into account, it could be considered below average in its emissions and therefore receive a payment from the Green Fund.

The Two Clean Development Incentives

The CDI provides incentives both to comply with the treaty and to reduce emissions.

The CDI actually provides two completely different incentives, an incentive to comply with flexible global carbon pricing, and an extra incentive to reduce emissions. The incentive to comply only works for countries with below-average emissions—countries that receive Green-Fund payments. If these countries do not price carbon at the global target price, their Green-Fund payments are scaled back in proportion to their under-compliance. If they don't price carbon at all, they receive no Green-Fund payments. If they price carbon at $10 when the global target is $20, they receive only half the their Green-Fund payments. This is a strong but gentle form of compliance incentive for countries receiving substantial Green Fund payments. That includes all countries with emissions significantly below the world average per-capita emission level.

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[1] As presented here, (but unlike in *Carbonomics*) the Green Fund incentive rate, *G*, and the pricing incentive rate, *Z*, are unrelated. However, there is a technical reason that *G* should not be too weak compared to *Z*. This is explained in "Flexible Global Carbon Pricing: A Backward Compatible Upgrade For The Kyoto Protocol" (available on global-energy.org and from the European University Institute).

[2] Although these formulas fully explain the basic system, slight modifications are needed for special cases. These are fully explained on global-energy.org.

The incentive to reduce emissions works by the Green-Fund formula being based on emissions per capita.

The second incentive is the result of the Green-Fund formula being based on emissions per capita. Because of this, any country that reduces its emission per capita either saves money by reducing its payments into the Green Fund if it is a high emission country, or gains larger payments from the Green Fund if it is a low-emission country.

CDI payments incentivise actions over and above those of the base carbon price.

So, CDI payments reward a country for reducing its per-person emissions. But what useful actions will this new incentive encourage that the carbon price incentive does not already encourage? This incentive might encourage the government to research the country's geology to find the best places for carbon sequestration. If this leads to more carbon sequestration, the country will be rewarded with lower payments to the Green Fund, or higher payments from the Green Fund. Or a country might conduct an advertising campaign to change attitudes and inform people how to save fuel more cheaply (as happened with British Columbia's successful 'tax-shift'). Carbon pricing does not reward such actions, even though they would reduce the country's carbon emissions. But CDI payments reward all emission reductions.

What Is the Advantage for Developing Countries?

As developing countries' economies grow, Green-Fund payments will apply consistent downward pressure on their carbon intensities, while helping to keep them in compliance.

Altogether, half the world's emissions come from countries with below-average emissions—the countries that will receive Green-Fund payments. These countries will likely contribute more than half the emissions in the coming years and more than half the increased demand for oil. Green-Fund payments will help bring these countries into full compliance with the global-carbon-pricing policy.

Bringing countries like India into full compliance will have a huge impact on the way their fossil-fuel use develops.

India, for example, emits far less per person than the global average but has the world's fastest-growing population, which is expected to surpass China's by 2050. It is also growing economically at a tremendous rate. Bringing countries like India into full compliance will stop their subsidization of fossil fuel and cause them to increase its price instead. This will have a huge impact on the way their fossil-fuel use develops—much greater than the impact of paying them for specific products under the U.N.'s Clean Development Mechanism. And paying them to join the world effort will prove far cheaper.

The resulting reduction in the world oil price may cover the cost of Green-Fund payments.

Also, participation in global carbon pricing will bring these countries into the global oil consumers' cartel, helping reduce world oil prices more than the U.N.'s clean development projects ever will. As developing nations join the effort to reduce oil use rather than subsidize it, the resulting reduction in the world price of oil may well cover the entire cost of Green-Fund payments.

Green-Fund payments are probably the most cost-effective way to curb global warming.

In short, Green-Fund payments are probably the most cost-effective measure we can take to curb global warming. Developing countries have other, more pressing problems, and without these payments, they will simply feel it is unfair for them to clean up the mess we got rich making—even though we intended no harm. Without today's low-emission countries adopting carbon pricing, we cannot solve the global problems of climate change and energy security.

A uniform global carbon price would treat the very poorest countries unfairly.

A uniform carbon price across all countries is the most cost-effective way to curb emissions. But a carbon price is a burden. The burden on a poor country is proportionally less than the burden on a rich country, because the poor country generally has less carbon to tax. But even this system treats the very poorest countries unfairly.

By linking the CDI to *emissions per capita* can we take full advantage of the incentive value of Green-Fund payments.

A Clean Development Incentive, based on emissions per capita, can correct the problem, and the resulting flows of funds are, in essence, the workings of a Green Fund of the type proposed by Mexico and other nations. Payments into and out of the Green Fund (CDI payments) should not be based on income, or on past emissions because, these payments constitute an important and potentially valuable incentive. If the payments depend on income then they provide a perverse incentive for countries not do develop and grow. If they are based on past emissions, then they provide a meaningless incentive for countries to change their past. Only by linking the CDI to emissions per capita can we take full advantage of the incentive value of Green-Fund payments.

The Clean Development Incentive can unite the world in a campaign for energy security and climate stability.

Most important, the Clean Development Incentive can unite the world in a campaign for energy security and climate stability. Only with such a globally unified campaign will the world overcome its global challenges.