

Creating an Earth Atmospheric Trust: A system to control climate change and reduce poverty

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Stabilizing concentrations of greenhouse gases in the Earth's atmosphere at a level that will fulfill the mandate of the UN Framework Convention on Climate Change to avoid "dangerous anthropogenic interference with the climate system" will require drastic departures from business as usual. Here we introduce one attractive response to this challenge that may seem visionary or idealistic today but that could well become realistic once we reach a tipping point regarding climate change that opens a window of opportunity for embracing major changes.

No silver bullet exists capable of solving the complex and interdependent problems of climate change, sustainability, and economic development. A consensus is emerging, however, that solving these problems will require major changes in existing governance arrangements to eliminate or at least alleviate what the 2006 Stern Review (1) calls the "greatest and widest-ranging market failure ever seen" - the failure of the market to send proper signals about the real costs of using the atmosphere as a repository for greenhouse gases. This case exhibits the defining features of market failures surrounding open-access resources (2-6). Because emitters allowed to use the atmospheric commons as a repository for the wastes associated with burning fossil fuels at no cost, they have every incentive to use as much of this free factor of production as

possible. But the present and future costs to society of this practice are enormous. Estimates of these costs vary. But there is compelling evidence that the eventual costs will exceed the cost of changing our current practices to limit emissions of greenhouse gases by a large margin (1).

Analysts have proposed a variety of forms of carbon taxes and cap-and-trade systems as policy measures to deal with this problem (7, 8). A few measures, like the European Emission Trading Scheme, have been implemented to some degree. But the measures under consideration at present are deeply flawed. In this article, we present an alternative system that has several attractive features, including the capacity to deal fairly with the regressive nature of most carbon taxing systems, to protect the new governance arrangements from political manipulation or corruption, and to contribute to the alleviation of global poverty. Working out the details of the general plan will be an ambitious task, but we think it is important to take the first step and propose a broad strategy having the six principles laid out below.

The core of this system is the idea of a common asset trust (9, 10). Trusts are widely-used and well-developed legal mechanisms designed to protect and manage assets on behalf of specific beneficiaries (11). Extending this idea to the management and protection of a global commons, such as the atmosphere, whose owners/beneficiaries include all people alive today as well as future generations, is a new but straightforward extension of this idea. Because the atmosphere is global, the Earth Atmospheric Trust would be global in scope. Initial implementation at a regional or national scale may be necessary and appropriate, however, as we build toward a global system. We cannot examine in detail the path that implementation of the system might take, or how the many institutional, political, and administrative details would be addressed. Our purpose here is to present an integrative idea that has many positive features as the basis for further discussion in the post-Kyoto world.

The trust arrangement we envision has 6 basic features together with 4 special features and precautionary measures.

Basic Features

- 1) *Create a global cap-and-trade system for all greenhouse gas emissions (12).*
Although either a cap-and-trade system or a tax system could work, we believe a cap-and-trade system is preferable to a tax for this purpose, because the major goal is to cap and reduce the quantity of emissions in a predictable way. Caps set quantity and allow price to vary; taxes set price and allow quantity to vary.
- 2) *Auction off all emission permits – and allow trading among permit holders. This is essential in order to send the right price signals to emitters. An “upstream” auction at the point of entry of greenhouse gases into the economy would require only a relatively small number of agents to participate in the auction, a fact that would facilitate the administration of such a system.*
- 3) *Reduce the cap over time to stabilize concentrations of greenhouse gases in the atmosphere at a level equivalent to 450 ppm of carbon dioxide (or lower) as recommended in the Stern review (Figure 1). The price of permits will probably go up and total revenues will likely increase as the cap is reduced (see below).*
- 4) *Deposit all the revenues into an Earth Atmospheric Trust, administered by trustees serving long terms and provided with a clear mandate to protect the asset (the Earth’s climate system and atmosphere) for the benefit of current and future generations. The trust would be a separate, non-governmental organization similar in structure to the Alaska Permanent Fund or the Alberta Heritage Savings and Trust Fund (13)*
- 5) *Return a fraction of the revenues derived from auctioning permits to all people on Earth in the form of an annual per capita payment. This dividend will be insignificant to the rich - smaller than their per capita contribution to the fund - but will be enough to be of real benefit to many of the world’s poor people. At the current annual rate of global emissions of 45 Gigatons CO₂ equivalent (Figure 1) and an auction price of \$20 - \$80/ton (14), the Trust’s total annual revenues would be \$0.9 to \$3.6 trillion. If half the revenues were returned equally to all 6.3 billion current inhabitants of the Earth, the payment would amount to \$71 - \$285/capita/yr. Payments into the fund for the typical US resident producing 20 tons of CO₂ equivalent per year would be \$400 - \$1,600.*

- 6) *Use the remainder of the revenues to enhance and restore the atmospheric asset, to encourage both social and technological innovations, and to administer the Trust.* These funds could be used to fund renewable energy projects, research and development on new energy sources, payments for ecosystem services such as carbon sequestration, etc. If half the revenues were used for this purpose, this would amount to \$400 - \$1,600 billion per year initially. Transaction and administrative costs would consume a small fraction of this.

Special features and precautionary measures

- 1) Do not allow revenues to go into the general fund of any government. The revenues would all go into a new, independent Trust organization with an exclusive mandate to manage the atmospheric commons for the benefit of current and future generations.
- 2) Appoint trustees based on their understanding of the purposes and details of the Trust and dedication to the goals of the Trust, not their political affiliations, geographic origins, or other criteria.
- 3) Make all operations and transactions of the Earth Atmospheric Trust transparent by posting them in an open access format on the internet.
- 4) Make trustees accountable for their actions and decisions and subject to removal if they fail to manage the Trust to serve the needs of all the beneficiaries.

No system is perfect. A system designed on these general principles would be able, however, to achieve a global emissions cap capable of keeping CO₂ concentrations at 450 ppm or less. It would be fair; it would be efficient and relatively immune to political manipulation, and it would help to alleviate global poverty. Both Johathan Alter in Newsweek (15) and Robert Reich, former Secretary of Labor under Bill Clinton (16) have recently advocated the idea.

Could such a system ever be brought into being? The Alaska Permanent Fund (13) is a similar arrangement on a smaller scale that has been in operation for 30 years. Creating an Earth Atmospheric Trust, however, would obviously require overcoming huge political, administrative, and institutional barriers. While not diminishing the magnitude

of these challenges, we believe that it is at least imaginable that such a system could be implemented, especially once we reach a tipping point regarding responses to climate change. The political will to make the necessary changes is increasing rapidly (17).

Implementing the proposed Trust would obviously require a global political agreement – a successor to the Kyoto protocol - most likely negotiated under UN auspices.

Many details would need to be worked out in the international negotiations as well as over time to make the proposed Trust effective. Here we can only sketch the idea as a starting point and vision. Below we touch briefly on four important issues that would be among those to be resolved.

(1) Price dynamics. The price dynamics following the creation of the Trust would be something like the following (1, 8). The initial cap on emissions should be something close to current emissions, and the cap could then follow the trajectory shown in Figure 1 for the 450 ppm scenario. The initial auction price would probably be in the \$20-\$80/ton range (1). As the cap is reduced, two counterbalancing effects will come into play. First, the increasingly limited supply of permits will cause upward pressure on the price of permits. Second, the rising price of carbon-intensive goods and services will cause technological shifts toward less carbon-intensive goods and services, an overall lowering of emissions, and downward pressure on prices. In addition, the Trust can use part of its revenues for targeted investments in renewable energy and other technologies that reduce greenhouse gas emissions. It is hard to tell which of these forces would predominate. Our expectation is that prices would increase over time, but not as rapidly as one might expect due to supply constraints alone given the counterbalancing effects of induced technological change and targeted investment.

(2) The refund delivery mechanism. Is there a practical way to distribute small amounts of money to every person on the planet, without going through national governments? Such a mechanism would have to (a) have low transaction costs, (b) be relatively immune to fraud, and (c) have global reach. Ideally, it could be done electronically, with people everywhere being able to transfer funds from a global account to a local one. An obvious problem here is that billions of poor

people do not have access to banks, much less electronic transfers. One possibility is to allow ‘unbanked’ people to receive their dividends through a micro-credit system. The global Trust would work through entities like the Grameen Bank; where such entities do not exist, it would help start or spread them. In order to receive their dividends, residents would have to join a micro-credit group. All members of the group would pool their dividends to create a loan fund that would supplement the banks’ funds to be used for scholarships for local kids, etc. This would yield a double dividend: building community as well as individual wealth.

(3) The per capita formula. A straight per capita redistribution formula is the simplest, but it may not be the fairest or even the most politically satisfying. One possibility is to adjust the per capita distribution formula to account for past emissions. Thus, every person’s base dividend, calculated on a per capita basis, would be adjusted by a factor representing his/her country’s historic per capita carbon emissions. A U.S. citizen’s dividend would then be reduced substantially, while an African’s would be multiplied. While this might reduce the appeal of the plan within some wealthy countries like the U.S., most Americans would probably be willing to forego \$40 or so if they knew it was being used efficiently to reduce poverty elsewhere.

(4) Who buys the permits? The simplest approach here is to require permits at the point carbon is introduced to the economy. Fossil fuel producers would have to buy permits for production at all mine-mouths and well-heads equal to the carbon content of the fuels they take out of the ground. Land owners would be required to buy permits for land clearing, burning, or other carbon or other greenhouse gas releasing activities (they may also get credits for sequestering carbon). These agents would pass on the cost of buying permits to consumers, adding them to the price of fossil energy and other carbon-intensive activities, thereby making non-carbon-intensive activities more attractive and generating incentives for rapid shifts toward low-carbon alternatives. The big advantage here is simplicity: a relatively small number of agents would have to buy permits and be monitored. While rich countries will always be able to buy more carbon fuel than poor countries - an emission trading system can’t change that - the proposed system would

require rich people to pay poor people for the right to emit carbon into the global commons. This transfer would both encourage rich people to use less and allow poor people to get enough.

We encourage those interested in adding their name to a growing list of supporters of this idea to visit http://www.earthinc.org/earth_atmospheric_trust.php

References and Notes

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- 10) Barnes, P. 2006. *Capitalism 3.0: a guide to reclaiming the commons*. Berrett-Koehler, New York.
- 11) Souder J. A. and S. K. Fairfax. 1996. *State Trust Lands: History, Management and Sustainable Use*. Lawrence, KS: University Press of Kansas.
- 12) For clarity, we present a simple outline of the system we recommend. Multiple and important details are involved in the establishment of any broad-scale policy proposal. Our aim here is to present a cohesive vision, not a detailed prescription.
- 13) The Alaska Permanent Fund Corporation was established through a constitutional amendment approved by Alaska voters in 1976. Its structure and operation are explained at: <http://www.apfc.org/>. The Alberta Heritage Savings Trust Fund was also established in 1976 and is similar in structure (<http://thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1ARTA0000116>)
- 14) The \$20/ton price is what carbon credits were trading for in the European carbon exchange before the price collapse brought on by the issuance of too many free credits. The \$80/ton estimate is from the Stern Review (1). We believe the initial auction price will probably be closer to the \$80/ton estimate, but offer this range to bracket the possibilities.
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Emissions Paths to Stabilisation

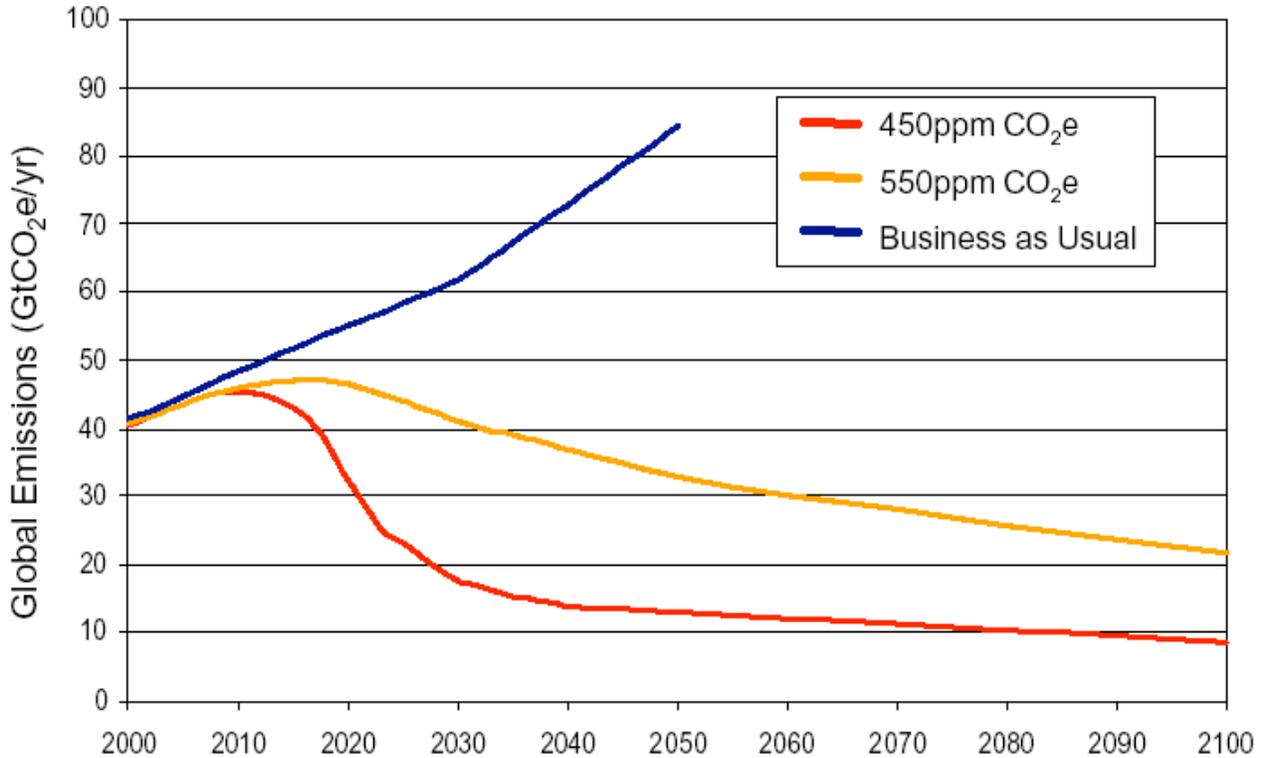


Figure 1. Emission paths necessary to create stable CO₂ concentrations at the specified levels. Source: Stern review on the economics of climate change, 2006. Note that units are Gigatons (billions of tons) CO₂ equivalent per year. Some sources provide emissions data in units of carbon (C) or carbon equivalents (Ce). Emissions reported in CO₂ or CO₂e units are 3.67 times emissions reported in C or Ce units due to the ratio of the mass of C to the mass of CO₂. Also, some sources report only emissions of CO₂ from fossil fuel energy sources, which are about 60% of total emissions, including other greenhouse gases, land use, and agriculture. Thus reported a global emission rate of 7 GtC/yr for fossil fuel burning only would correspond to a rate of approximately $(7/.6) \times 3.67$ or 43 GtCO₂e/yr.

