

The Case for a World Carbon Bank¹

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Abstract

This paper explores the idea of creating a new multilateral financial institution, a World Carbon Bank, to channel aid funds and technical expertise to low and middle-income countries, to aid with the green transition. A focused high-return first project could involve phasing out coal power plants and replacing with green alternatives. Coal accounts for 30% of global emissions. Many coal plants are located outside advanced economies and are relatively new. The costs of swapping them out is significant, and most poorer countries have little incentive or capacity to do so. WCB funds would be outright grants and not loans.

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This paper considers the possibility of developing a new multilateral economic institution, a World Carbon Bank (WCB), charged with coordinating aid and technical assistance to developing economies to aid in the green transition. The scale of financing issues are staggering, including both funds to phase out and replace legacy carbon-based power plants, to build a new green power infrastructure, and to allow for adequate energy supplies to allow for development in the transition. The costs are staggering. Estimates of the global cost for achieving the net zero 2050 goals range from 1 trillion to 3.5 trillion dollar of additional capital expenditure *annually* (Mckinsey, 2022), or roughly 1 to 3.5% of global GDP.² The problem, and it is the world's problem, is that a significant share of this expenditure needs to be invested in low and middle income developing economies. Under current policy commitments, emissions from developing economies and emerging markets are anticipated to account for the vast bulk of increased carbon over the next two decades, rising by five gigatons versus falling by two gigatons in advanced economies. China, which is the largest emitter at present, has committed to stabilize emissions by 2030 and go to net zero in 2060.³

Of course, it is well understand the 2050 net zero targets at this point may already be impossible to achieve for most countries, so the estimates for achieving them give perhaps an exaggerated assessment of realistic needs. Still, even just to “bend the curve” so that global average temperatures rise by only 2.0 or 2.5 degrees by 2100, will require expenditures and adjustments far in excess of current plans. It is sobering, indeed, to recognize that eight years

² McKinsey Global Energy and Materials and Sustainability, 2022. *The Energy Transition: A Region by Region Agenda for Near-Term Action*. New York: McKinsey.

³ See International Energy Agency (2021).

after the 2015 Paris climate accords, the roughly \$100 trillion dollar global economy still relies on hydrocarbons for over 80% of its energy.⁴

Europe and recently the United States, have marshalled considerable resources towards reducing emissions, but progress in low and middle income countries is far slower. The International Energy Agency (2022)⁵ estimates that close to 1.2 trillion dollars have been earmarked for clean energy investment support since the start of the COVID-19 crisis, but 95% percent of the global total, is to be spent at home. Of course, direct expenditures are only a crude measure; government support for the green transition involves an array of policies. India and China, for example, have both made enormous strides in adding wind, solar and nuclear alternatives, the latter due to differences in regulatory regimes. Nevertheless, the IEA estimates do capture the disconnect between rich-country ambitions for mitigating climate change, and the near paralysis of policies towards lower-income countries, where the returns to carbon mitigation are vastly higher.

I. The Fundamental Shift in Bargaining Power Arising from Climate Change

The growing risks posed by global warming portend a major power shift in economic relations between advanced economies and developing nations that has not yet been fully appreciated. Until now, the dominant theme in economic globalization have been the gains from trade in goods, services and ideas, and how to share them. For advanced economies, the major benefits include access to commodities and low-cost labor. For developing economies, it is the benefits from access to technology, capital and a greater variety of advanced products. International relations and security issues have always played a role, and with the Russian

⁴ International Energy Agency (2022a) *World Energy Outlook*, IEA, Paris.

⁵ International Energy Agency (2022b). *Government Energy Spending Tracker*. IEA (December).

invasion of Ukraine, that factor may become more important in the future. However, in general, benefits from mutual exchange were the dominant theme. The major multilateral economic institutions, the World Bank, and the International Monetary Fund, were designed with view to facilitating globalization, and to reducing the risks that problems in one country, or set of countries, would become globally systemic. But now a major transformation is underway.

As the 21st century unfolds, externalities related to global warming are rapidly rising from a secondary issue to a first-order problem, one that if not adequately dealt with will become the dominant challenge for all countries. The tensions between the interests of the advanced economies, which have developed in a carbon-intensive era, and developing countries that require vast increases in energy consumption in order to escape low income and poverty are profound. The International Energy Agency estimates that over 800 million people today do not have access to electricity, and 2.6 billion people do not have clean cooking options.⁶ Understandably, in evaluating the tradeoff between present consumption and future risks, denizens of low-income countries may potentially have very different preferences from rich countries, and very different perspective on tradeoffs between risks of long-term versus short-term survival. And on current trajectory, it is the evolution of policy in the low- and middle-income countries that will have the most impact on global warming going forward.

From a situation where advanced economies cared mainly about what they could extract from developing economies, we may be moving to a world in they may care just as much about the environmental externalities created by production in the developing world. An ideal solution, of course, would involve a global carbon pricing mechanism, with the first-best being a

⁶ International Energy Agency (2021b). *Financing Clean Energy Transitions in Emerging and Developing Economies*. International Energy Agency, Paris.

uniform global carbon tax. But achieving voluntary buy-in from developing economies, which have urgent pressing needs, will almost certainly require vastly greater transfers of resources, both to provide the necessary capital for transition, and to provide political incentives. There are also complex issues of measurement and reporting.

At present, the political debate about green transition in most advanced economies is very inward looking, with the 2022 Inflation Reduction act in the United States a leading example. Yet there are potentially much larger gains to spending green transition funds on lower income countries. Unfortunately, there is at present no good framework for doing so.

II. The Structure, Mission and Financial Structure of the World Carbon Bank

Here we consider the development of a World Carbon Bank as a concrete constructive step towards the green transition, and possibly as nascent model for broader cooperation and burden-sharing between advanced and developing economies in this sphere.⁷ Critically, the institution would need to be focused much more narrowly than the World Bank or the International Monetary Fund, with its sole charge being to help channel funding and technical expertise from advanced economies to developing economies. It would maintain a largely technocratic role, aimed at helping countries minimize emissions as their production and consumption of energy grows, sharing information and best practices across countries.

It would be important to start with a relatively narrow and focused mission where the returns are likely to be quite high. The obvious one would be to help shut down high-emission coal plants across the developing world and substitute where possible with renewable alternatives

⁷ This paper expands on the initial proposal of Rogoff (2019), “The Case for a World Carbon Bank,” Project Syndicate (July)

such as wind and solar. Coal is a very big part of the global energy picture, accounting for 30% of global CO₂ emissions⁸. In advanced economies, the average age of existing coal plants is 47 years,⁹ compared to less than 15 years in developing economies. Moreover, coal is in abundant supply both in India and China. Decommissioning the coal plants in Europe and the United States is a straightforward decision, even if Germany was forced to postpone plans during the post-Russia invasion energy spike, and 2017-2020 US President Donald Trump made the domestic political decision to ease restrictions on coal during his term in office. Significantly, although more than 20 countries have pledged to phase out coal-fired power, nearly all of them are in Europe and account for less than 5% of the world's coal-fired power stations.¹⁰ China, which accounts for roughly half of the world's coal production and half its coal-fired power plants¹¹, has made a pledge to stop building coal plants abroad, notably in Vietnam and Indonesia.¹² But it is still building over half the world's new coal plants at home (Yergin 2022). The cost of shutting down the developing world's relatively young coal plants and replacing the supply is perhaps the clearest and impactful focus for green transition funds. It would be an area where a new World Carbon Bank (WCB) could have relative focus and impact without conflicting with imperatives on existing multilateral institutions.

Importantly, alternative energy sources must be found and the WCB must have enough independence so that can make technocratic judgements on feasibility and practicality of other sources. For example, in developing countries that are already established nuclear powers, such

⁸ International Energy Agency, 2021a. *Global Energy Review: CO₂ Emissions in 2021*. IEA, Paris.

⁹ Hook, Leslie, "New Asian Coal Plants Knock Climate Goals off Course." Financial Times October 21, 2018

¹⁰ International Energy Agency, *World Energy Outlook*. 2022. IEA, Paris.

¹¹ Reuters, March 2021. "China Generated Over Half the World's Coal-Fired Power in 2020." See also IEA World Energy Report (2021a).

¹² BBC, September 22, 2021. "China Pledges to Stop Building Energy Plants Abroad."

as India, nuclear energy might also be considered as an important element of the mix, and should not be blocked simply to buy a block of votes for a politician in an advanced economy. (If there is an economic rationale, say experts determine that renewable energy costs are falling so fast that nuclear is not economically competitive, that is a different matter.) The WCB should also be free to assess whether natural gas might be an important transition tool for some countries. It is notable that in the famous 2004 “Princeton wedges” analysis, replacing dirty coal plants with relatively clean natural gas was a centerpiece of early calculations of how to mitigate climate risk, and indeed the core reason for the stabilization of emissions in the United States in the 21st century to date.¹³ Of course, the cost of renewables has come down sharply since then, but most sober analysis still suggest that natural gas has a significant transition role.¹⁴ Also, there is also a risk that as investment in renewables continues to ramp up, bottlenecks in supply will sharply push up prices of key renewable inputs such as copper (Yergin, 2022).

III. Why Not Delegate to the IMF or World Bank?

What are the advantages of having a specific institution to coordinate policy on the green transition as opposed to the current international arrangements, for example the periodic United Nations climate conferences? The climate conferences are enormously helpful in establishing the pulse of the climate movement and articulating challenges, and a World Carbon Bank would not be a substitute. But conferences such as the most recent COP27 cover an enormously broad range of issues, while lacking the large professional secretariat and the extensive financing capacity necessary to accomplish the kind of economic and technical transfer envisioned here.

¹³ See "Stabilization Wedges: Solving the Climate Problem for the next 50 Years with Current Technologies," S. Pacala and R. Socolow, *Science*, August 13, 2004.

¹⁴ See Daniel Yergin (2022). *The New Map: Energy, Climate and the Clash of Nations*. New York: Penguin Press.

The management and professional structure of the existing Bretton Woods institutions provide useful models for how the WCB might be designed. Through long experience and practice, these institutions have developed an extremely efficient tri-pronged model. First, they have developed the approach of sending small, focused missions that have high-level access to national officials, and long-term relationships with institutions in the developing economies that allow them to gather information quite efficiently. The mission-technology is a key element of the success of both institutions, but particularly the IMF. Annual WCB mission reports can provide an objective outside assessment of each country's carbon policy and progress, on a uniform basis. This alone would be a huge benefit. Other, regional, WCB publications could build on these. Second, both institutions have become highly proficient at building and maintaining data bases on relevant statistics, for example the joint BIS-IMF-World Bank data on external debt statistics¹⁵, along with the IMF global debt database¹⁶, help countries and investors assess lending risks. They also provide citizens within each country a level of transparency about their countries' borrowing policies that is often otherwise hidden. Third, through publications, semi-annual meetings and periodic conferences, the IMF and the World Bank play an important role in helping government officials and technocrats to share best practices across countries. A World Carbon Bank can play these three important roles, in addition to being charged specifically with identifying and financing green transition projects.

What about funding? An initial level of at least \$100 to \$200 billion in annual aid (outright grants) would seem like a low-end number if global warming is taken seriously. At the 2009 UN climate change conference, developed economies committed to mobilizing \$100 billion per year

¹⁵ The most recent edition is the Joint External Debt Hub, maintained jointly by the BIS, IMF and the World Bank (<http://www.jedh.org/>)

¹⁶ The IMF global debt database may be found at <https://www.imf.org/external/datamapper/datasets/GDD>

to assist emerging markets in the climate transition. However, the 2009 commitment was informal and actual flows have been only a small fraction of that. And if one were to take into account CPI inflation since 2009 in the United States, one hundred billion dollars of 2009 dollars could translate into roughly \$140 billion in 2023 dollar. The formation of a WCB, if instituted through an international treaty, could also for paid-in capital to underpin the grants. In order for the WCB to be effective, it would need reliable access to funding on a very long-term basis. The most straightforward way to enforce the aid commitments would be to require donor countries to contribute bonds equal to ten times their annual commitment, with the requirement that it be replenished annually. For example, if the United States committed to \$40 billion per year, then it would have to pay in \$400 billion of capital, and add \$40 billion per year. (There could be an inflation adjustment.) The WCB would be constrained in its charter never to draw out more than a country's annual commitment; exceptions would not be allowed. But if a country failed to replenish in a timely fashion, it could draw down the paid-in capital, giving a long lead time for plans to replenish or substitute. The history of aid policy suggests that weaker commitments are not likely to be sufficiently credible, and given that the rich countries are huge beneficiaries to the extent WCB policies help mitigate global warming, the costs are reasonable. After all, the rich countries collectively spent many trillions of dollars during the pandemic (the United States alone roughly \$5 trillion in stimulus bills), presumably \$250 billion is not such a large figure.

Why can't the World Bank or the International Monetary Fund be adapted to this a specific task such as helping to phase out coal plants? In principle, it certainly is possible, for example, making the WCB a new branch of the World Bank, in parallel with others such as the International Finance Corporation. However, there are several obstacles. First, the Bretton Woods Sisters' financing is almost entirely in the form a loans, relatively short-term (two to four

years) in the case of the IMF, which has much the deeper pockets (albeit Bulow and Rogoff, 2005, argue that even with its existing objectives, it would make sense to have the World Bank only able to outright grants, not loans.¹⁷ Funds from the World Carbon Bank should be entirely in the form of outright transfers from rich countries to developing economies. Shutting down relatively young power plants and replacing them with renewables produces no development, and no increased capacity to pay future loans. A great many countries around the world already face profound challenges in the post-pandemic era, with more than 60% of low-income countries already in default or debt distress.¹⁸ The scale of the costs involved in the transition would overwhelm developing country fiscal capacity if in the form of loans. (It is an entirely separate question of where funding for new power production capacity, and how to align incentives so countries do not get paid to tear down existing coal plants while proceeding to build new ones.)

In principle, either the IMF or the World Bank could be given new funding and staffing capacity to expand into projects such as decommissioning legacy coal plants. But if climate is really an over-riding imperative for advanced economies in the 21st century, then the diffuse political and economic pressures on the existing institutions could undermine the objectives. The World Bank, for example, has gone through periods where it has been very reluctant to finance natural gas projects. The IMF, which has certainly made important efforts to focus more on climate, nevertheless is primarily charged with maintaining global financial stability, and the expertise of its board, management and staff is focused in this area. Certainly IMF and World Bank can be seconded to the WCB, for example, making use of their expertise in monitoring corruption. But if global warming is the existential threat above all others, the focus of WCB

¹⁷ Bulow, Jeremy, and Kenneth Rogoff. 2005. “**Grants versus Loans for Development Banks.**” *American Economic Review* 95 (2): 393–97.

¹⁸ See Rogoff, Kenneth, 2022. “Emerging Market Sovereign Debt in the Aftermath of the Pandemic.” *Journal of Economic Perspectives* 36 (4), Fall: 147-166.

must be very narrow. A narrow focus would make it much easier to scale up the WCB over time, should it prove itself. Obviously, just as the IMF and World Bank have continually reinvented themselves over the years to respond to the problems of the day, the WCB will need to have flexibility, but its core mission must be maintained as long as the global warming risks remain acute.

Another idea would be to upgrade the International Energy Agency. The IEA has far more expertise on energy than the IMF or the World Bank; its reports are very well regarded. However, it does not significant capabilities in the area of financing. Moreover, the IEA is an autonomous agency of the OECD group of countries, and does not have the worldwide representation of a genuine multilateral institution. The emphasis in its reports of recent years has arguably had an increasingly European perspective; Europe is the largest constituency.

The governance structure of the World Carbon Bank would likely need to have a structure similar to the IMF and the World Bank in that the major donors would have a larger share of the vote on issues related to loans. However, the donors would likely have different weights than the two institutions created immediately after the second world war. And there are some areas where the WCB should improve on the IMF and World Bank, for example in having a more merit-based process for selection of the head of the WCB. Until now, the head of the IMF has always been from Europe, the head of the World Bank from the United States. One idea would be to have a committee of independent experts come up with a list of three candidates that the membership could vote on, with the understanding that the choice of head would rotate regions over time.

One must acknowledge that current US political sentiment is very hostile to foreign aid, particularly among more conservative groups. However, as evidence continues to grow on

problems caused by climate change, that reticence is likely to weaken, and younger voters are much more favorably inclined, albeit there is little understanding that a large fraction of future emissions will come from developing economies. Even if the appetite does not yet exist, it could develop quickly. For example, the problem of climate refugees is likely to grow dramatically over the coming decades. Whereas estimates such as those of the Institute of Global Peace, which suggest over a billion climate refugees by 2050¹⁹, seem hyperbolic, there is little question that the kinds of migration problems that the US and especially Europe have faced in the past decade are likely to grow exponentially as swatches of the planet become inhospitable. There is a broad literature trying to estimate quantitatively the costs of climate change where even the lower bound numbers are quite substantial.

Over time, the World Carbon Bank could be expected to evolve in activities. A primarily technocratic institution, it could not be expected to serve as political forum to make broad deals on climate payments, but it could be a secretariat to such deals, and could be tasked with implementing agreements that fell within its mandate.

IV. Broader Financing for the Green Transition and China

What about the broader financing that developing economies and emerging markets will need to make the green transition, with sums certainly running into the trillions for the group collectively? Even with the narrow initial focus of the WCB on phasing out legacy coal plants, there would need to be some conditionality. For example, the grants from the WCB could contain a clause that the funds would have to be repaid (or partially repaid) in the event new coal plants were built. Over time, if coal remained a cheaper alternative for many countries, then in

¹⁹ Institute for Global Peace, 2022. Ecological Threat Report. IGP, Sydney.

addition to paying for decommissioning, the World Carbon Bank would need to include incentives and subsidies so that new energy projects were not the worst kind of fossil fuel. Over time, adjustments could be made so that all fossil fuel energy is phased out, but for the time being there must some allowance for transition.

Last but not least, there is the issue of how to deal with China, which has become a central player in debt and climate discussions, and will surely have to be a central player in the WCB for it to be effective. In the near term, it is important that aid to poor countries not be used simply to pay off legacy loans to China. This is a problem facing all multi-lateral development banks at present, particularly in the low-income countries now in default, where there is disagreement between China and other governments about where to draw the line between official and private lenders. (China takes the position that its banking sector is overwhelming populated by state bank, some of which operate on similar principles to Western private banks, and should be treated as such in debt negotiations, where historically official creditors make much larger concessions despite claiming to be senior.) China itself is now the world's major producer of emissions and must be included in any major new emissions reduction initiative. China simply would have to be a significant shareholder in the World Carbon Bank.

It is, of course, possible that the global warming problem will not unfold as in the more apocalyptic scenarios, and that the impetus to transfer funds to developing economies targeted at climate change will abate. Much more likely, however, is that the global warming problem will continue to worsen and become a dominant feature of the global economic and political landscape. Many tools are needed, first a foremost a global carbon tax (Cooper, 2004).²⁰

²⁰ Cooper, Richard, 2004. "A Global Carbon Tax?" Commissioned Briefing Notes for the CIGI/CFGS L20 Project, Council on Foreign Relations.

Advanced countries may also consider using what developing countries will regards as putative measures such as Europe's planned carbon border tax, to penalize exports from countries that create large scale emissions. However, if such measures are done absent some very strong measures to alleviate the transition costs to poorer countries, they are very unlikely to be successful.

V. Conclusions

Up to this point in time, advanced economies have had little interest in giving large-scale aid to low- and middle-income countries, certainly not on a scale commensurate with paying for damages caused by their policies, including carbon-intensive growth and colonialization. The global warming problem, however, just might energize much larger financing, particularly if it can targeted and project oriented. The problems of financing the green transition in emerging markets and low-income countries is far bigger than discussed here. Most of the funding will have to be in the form of private sector finance. However, even here, having a World Carbon Bank than can convene meetings to share best practices, publish data on uniform cross-country basis, and send missions to assess countries' carbon policies, would be a very valuable contribution. The costs of maintaining these functions will be similar to the IMF and World Bank staffing costs, on the order of one to two billion dollars per year. But the main focus of the first tranche of expenditures, phasing out legacy coal plants, alone makes the WCB worth establishing.

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