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In Search of a New Effective International Climate Framework for Post-2020: A Proposal for an Upstream Global Carbon Market

Mutsuyoshi Nishimura and Akinobu Yasumoto

CCEP working paper 1117, November 2011

Abstract

Given the urgency and the magnitude of emission cuts required to arrest the global temperature rise at an acceptable level (like 2 degrees Celsius), it is imperative that action to mitigate climate change is taken at the lowest cost. This can be done if a cost effective set of policy tools with a focus on carbon pricing is applied as broadly as possible across all emission sources. In view of the emerging consensus on the temperature target like 2 degrees Celsius, it is imperative that climate scheme caps global emissions rather than allowing governments to arbitrarily pledge their intended cuts. Global emissions must be contained within the limit of carbon budget that achieves temperature objectives. Emission allowances must be issued in accordance with such limit and be sold to the global demand of emitters. Such sales of carbon budget give rise to both the most accurate carbon pricing as well as new revenue that can be used for much needed climate financing for developing countries. A new climate regime along those lines would stop global warming at an acceptable level, provide a new large climate funding that would integrate developing countries to a global low-carbon growth and transformation and keep all economies thriving, whether they are developing, emerging or developed. The post-2020 climate regime must be nimble and effective, not unwieldy and least burdensome. It must also be durable and fully congruent to the economic realities of the coming decades.

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A proposal for an upstream global carbon market

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Abstract

Given the urgency and the magnitude of emission cuts required to arrest the global temperature rise at an acceptable level (like 2 degrees Celsius), it is imperative that action to mitigate climate change is taken at the lowest cost. This can be done if a cost effective set of policy tools with a focus on carbon pricing is applied as broadly as possible across all emission sources. In view of the emerging consensus on the temperature target like 2 degrees Celsius, it is imperative that climate scheme caps global emissions rather than allowing governments to arbitrarily pledge their intended cuts. Global emissions must be contained within the limit of carbon budget that achieves temperature objectives. Emission allowances must be issued in accordance with such limit and be sold to the global demand of emitters. Such sales of carbon budget give rise to both the most accurate carbon pricing as well as new revenue that can be used for much needed climate financing for developing countries. A new climate regime along those lines would stop global warming at an acceptable level, provide a new large climate funding that would integrate developing countries to a global low-carbon growth and transformation and keep all economies thriving, whether they are developing, emerging or developed. The post-2020 climate regime must be nimble and effective, not unwieldy and least burdensome. It must also be durable and fully congruent to the economic realities of the coming decades.

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Introduction

The current international approach to arrest global warming is devoid of an agreed numerical goal of climate stability. It is based upon the arbitrary ambitions of governments, which are forcing enterprises operating in their territories to cut their emissions. But this ‘aggregated ambition’ level is hardly connected with what science argues is needed for achieving acceptable climate objectives, such as holding the temperature rise below 2 degrees Celsius. The current approach is a painful process for governments and enterprises, as it forces them to reduce increasingly their emissions by more than they can afford.

The current international approach to arrest global warming is also devoid of a functioning permanent system for climate financing in developing countries. In stead, it largely depends upon arbitrary contributions of financial resources from governments’ treasuries. Private financial flows do not always meet the climate needs of developing countries. The long-term and stable flows of climate financing needed to meet the soaring requirements of developing countries are unlikely to materialise given the dire fiscal prospect of many nations.

A new international approach must be introduced to make sure that an accepted level of climate stability is effectively achieved on time and with the least cost. The approach must also provide a new, stable and credible financing system for developing countries, which is decoupled from the donor community’s economic ups and downs. In short, a new approach is urgently needed to ensure both climate stability and climate financing, but in a manner that is least stifling to the world economy.

The surest and most effective approach is to place a cap on global emissions with a carbon budget that will ensure the agreed climate stability. The least expensive and least stifling approach for the world economy is to establish a carbon market where a single common and rising price of carbon provokes a global shift away from the use of fossil fuels and encourages investment in low-carbon technologies.

The global carbon market will give rise to new, large and credible revenue as it sells by auction the carbon budget that will achieve the agreed level of temperature rise. Thus the global carbon market will provide large, constant and credible new financing for developing countries, creating the best chance for them to get out of poverty while also providing them with the requisite revenue for their basic energy services and low-carbon transformation.

Key elements of the proposal

The key elements of the proposal are for participating governments to cap global emissions with the carbon budget that will limit global warming at an agreed level, own such budget, sell them by auction as allowances to CO₂ emitters, obtain new revenue for climate financing from such sales and enforce all CO₂ emitters to buy allowance when they burn fossil fuels.

More specifically, the proposal invites governments to:

- Decide on the total amount of carbon budget and the peak year that will limit global warming at an agreed level. This proposal assumes hypothetically that governments agreed to hold the temperature rise below 2 degrees Celsius and for that purpose not to emit more than 660GTCO₂ globally during the period 2010–2050¹.
- Put collective property rights over the carbon budget of 660GTCO₂.
- Establish individual national upstream carbon markets and link them, allowing free and unimpeded trading amongst them, thus creating a single global upstream carbon market.
- Sell the carbon budget, newly acquired properties for the humanity, by auction in the form of allowances and by installment (of 3, 5 or 10 years until 2050) to global CO₂ emitters.
- Make it mandatory for all CO₂ emitters to buy allowances in the carbon market.
- Collectively obtain new revenue from the sales of allowances.
- Decide on how much of such revenue will be given to governments in need of climate financing.
- Decide on how much of the new revenue will be set aside for investment in technology innovation.
- Establish a compliance system as explained below.
- Designate the UNFCCC and, if needed, other institutions to run the whole system.

Global cap and carbon pricing achieving the least expensive climate stability and technology innovation

In this proposal, climate stability is to be achieved by the issuance of emission allowances to an amount not exceeding 660GTCO₂ for the period 2010–2050 and by making it mandatory for all CO₂ emitters to purchase allowances in the carbon market. Thus, governments will no longer be burdened with national emission reduction obligations.

The concept of ‘national emission’ does not exist in this proposal, and nor does the concept of national burden sharing. Governments do not have to make any reduction efforts. In fact, in this proposal nobody is obligated to reduce emissions. Entities all over the world will be able to buy allowances in the carbon market and emit CO₂ as much as they like as long as they can maintain profit margins at the prevailing price of carbon.

Today’s consensus theory holds that paying a price for carbon emitted into the atmosphere is the surest way of motivating entities and individuals to emit less and produce more. As all CO₂-emitting entities of the world buy allowances for the amount of CO₂ they emit, they bear the expenses of carbon cost (externalities) in the first

¹ ”Going Clean – The Economics of China’s Low-carbon Development” Stockholm Environment Institute and the Chinese Economists 50 Forum, Nov. 2009.
<http://sei-international.org/mediamanager/documents/Publications/china-cluster/china-going-clean-20091221.pdf>

Meinshausen et al. Greenhouse-gas emission targets for limiting global warming to 2 °C. Nature 458, 1158–1163(2009). : <http://www.nature.com/nature/journal/v458/n7242/full/nature08017.html>

instance. The carbon cost is then passed on to the price of their products, thereby internalising the externalities. Households worldwide eventually defray the carbon cost when they buy those products. In the end, households of the world are the ultimate polluters and they have to pay for the carbon price.

Since the carbon budget is limited to 660GTCO₂, the price of carbon goes up over time uniformly and globally, triggering a parallel price hike in carbon intensive products. Only when they realise the high price rise of carbon intensive products will households start changing their behavior globally and switching to less expensive, low carbon-intensive products. This will, in turn, force enterprises globally to shift their investment behavior and trigger a global low-carbon transformation.

This proposal, which caps global emissions and does not cap national emissions, ensures climate stability at the lowest cost and right on time. Only by capping globally and harnessing a carbon market can the climate target be achieved effectively and cheaply. Creating a single world carbon price provides a level playing field for all enterprises of the world, thus eliminating competitiveness concerns like carbon leakage. It provokes technological innovation not through command and control policies but through powerful price signaling. Since it allows all enterprises globally to use fossil fuels as much as they need, the proposal is not production stifling.

The proposal employs a top-down approach. Global climate efforts need to have a numerical stability target if they are to avoid wasteful investment. Investing hugely and not achieving climate stability is not a tenable position politically or economically. The proposal avoids bottom-up-only strategies where nations invest without setting climate targets of any sort. The proposal aims to achieve the stability target entirely through market functions. It avoids command and control measures which have been common in many national abatement actions. The proposal aims to set up a nimble and most cost-effective climate scheme. It is not unwieldy and least burdensome to manage.

New form of climate financing to help developing countries realize low-carbon transformation

The proposal offers a new form of climate financing by letting governments collectively earn new revenue. The distribution of revenue must be collectively decided by the assembly governments.

The proposal presumes that governments would most likely use the revenue to (i) help countries in need and (ii) invest in technological innovation. Most developing countries are in need due to various reasons like historical emission realities, lack of capital formations, lack of growth capabilities, national incomes levels etc (i-a). Some developed countries are also in need as they would have vulnerable sectors which governments might wish to take care of (i-b). This proposal therefore presumes that there are three revenue spending categories, i.e. (i-a), (i-b) and (ii).

The assembly of governments must decide how much revenue would be given to each of the three categories. They must also decide on how much would go to each individual country (like \$aa billion to country A....\$zz billion to country Z).

All decisions must be reached through negotiation. Such negotiations could be facilitated by establishing a common set of criterion in advance whereby all relevant factors would be taken into account. A certain group of governments would favour per-capita equalisation of emissions. Others would argue in favour of population factors. Yet others would argue that historical realities of CO2 emissions must be taken into account in such decisions. This proposal accepts any formula or criterion as long as they are agreed upon *ex-ante* by governments.

With or without agreed criteria *ex-ante*, the world is to overwhelmingly favour, support and assist developing countries in their shift to low-carbon transformation. This proposal is therefore based upon such recognition. The proponents of the proposal firmly believe that the largest amount of new revenue would be spent to benefit developing countries.

A common assumption is that governments will find it difficult to agree on how much climate financing will go to government A and how much to government B. The proponents of the proposal, whilst recognizing the difficulties, believe that governments will most likely come to an agreement amongst themselves as it is senseless to renounce collective new wealth of a substantive magnitude.

The proponents of the proposal believe that it can yield new revenue in the order of \$500-600billion *per annum* under the following hypothetical assumptions.

Carbon budget of 660GT CO2 for 2010–2050 can be divided into four 10-year phases as follows.

<i>Ph.I(2010-2020)</i>	<i>250GT</i>
<i>Ph.II(2020-2030)</i>	<i>200GT</i>
<i>Ph.III(2030-2040)</i>	<i>150GT</i>
<i>Ph.IV(2040-2050)</i>	<i>60GT</i>
<i>Total</i>	<i>660GT</i>

With a hypothetical carbon price being \$25 per ton CO2, the total amount of new revenue in Phase I (2010–2020) would be \$6,250 billion or \$625 billion per annum. ■

Once governments agree on how much money goes to each of them, they will have to establish a detailed technical methodology to realise the decision. In this regard, the proposal suggests a methodology based upon initial allocation of allowances to governments. If the assembly decides to give a particular developing country \$1billion as climate financing, allowances would be given to that government to the amount that would yield \$1billion once they are sold on the global market. In this hypothetical case, if the carbon price is \$25 per ton, the developing country's government would receive 40 million tons as initially allocated allowances. The government would then sell all its allowances and obtain \$1billion as climate financing.

The climate financing mechanism in this proposal does not burden the public money of any government. It does not involve either public money of any treasuries or private financial flows of private entities. It derives from all those who pay for carbon containing products. Under this proposal, CO2-emitting entities are to pay for the

externality costs of emitting CO₂ into the atmosphere in the first instance, but ultimately those costs are defrayed by households worldwide.

New revenue comes from global sales of allowances by auction. Those allowances are the collective property of all governments. They are not the property of any single government. Therefore, new revenue from such sales belongs to the assembly of governments, not to any single government. This proposal provides for governments to decide to send a part of such revenue to countries in need and for technological R&D. Hence, the proposal does not do anything which might be deemed as the transfer of the financial resources of one country to another.

Simple and effective compliance system

This proposal will operate at an upstream level of the carbon market and cover the whole economy so that the carbon price reaches the point where the supply and demand of allowances meet globally. A downstream system which covers just part of the carbon economy would require governments to monitor the emissions data of an untold number of emission points every year all over the world. Such a tremendous burden would be impossible for any country to bear.

In an economy-wide and upstream carbon market (*), all that governments must do to ensure compliance and avoid fraud is check the statistics related to the importation and domestic shipment² of fossil fuels. Importers and/or domestic shippers of fossil fuels of all countries will be required to surrender allowances to national authorities when they import and/or domestically ship fossil fuels. The authorities in all countries will check the amount of surrendered allowances against the volume of the CO₂ content of the fossil fuels imported and/or shipped domestically. If the surrendered allowances match the volume of CO₂ content of the fossil fuels imported and/or shipped domestically, there is no fraud involved. In order to avoid fraud, governments will have to legislate laws punishing them severely.

(*) In this proposal, the global upstream carbon market has participating governments as sellers of allowances and all CO₂ emitters of the world as buyers. All CO₂ emitters obtain fossil fuels either from importation or from domestic fuel shipments. Domestically shipped fossil fuels are those that have been produced and shipped for domestic consumption. Therefore, in actual transactions, importers and domestic shippers of fossil fuels are buyers of allowances in the proposed global carbon market. Once importers and domestic shippers paid for allowances for fossil fuels they import or ship, actual emitters that buy those fuels from them do not have to obtain allowances anew.

It provides gains to all countries and inflicts no pain

The proposal is beneficial to all countries. It is beneficial for developing countries as it

² Domestically shipped fossil fuels are those that have been produced domestically and shipped for domestic consumption.

provides credible and large new financing, which will enable their CO2 emitting entities to emit as much as they need and produce more than otherwise. New financing also enables governments of developing countries to engage in adaptation, render energy services to local communities and promote all other priority programs for improving the living conditions of local communities, job creation and vocational training etc.

It allows all entities of all countries, whether they are developing, emerging or developed, to emit CO2 as much as they need for their rapidly increasing economic production and growth. The proposal does not stifle in any way the production and growth of entities of rapidly growing economies. In addition, to the extent the large influx of new wealth going into developing countries would create a new demand for the innovative technologies of the developed and emerging economies, the proposal would result in a win-win case.

In conclusion...

Here is what our proposal aims to do in essence. If governments put property rights on 660GTCO2 of carbon budget, and sell them to emitting entities worldwide, it should have three important dividends:

- ☞ Holding the temperature rise below 2 degrees Celsius;
- ☞ Providing a new built-in and large climate financing mechanism; and
- ☞ Ensuring all enterprises of all countries full access to carbon budget and emitting CO2 as much as they can pay.

Today, the international community is at an important crossroads. Science is now telling the world that effective action to arrest global warming must be taken immediately. What is needed is a system that will save the planet on time and keep all economies thriving, stimulate innovations and, most importantly, provide developing countries with credible climate financing so that they are integrated in the global low-carbon transformation. We hope this proposal serves this purpose.

References

OECD (2009)

The Economics of Climate Change Mitigation: Policies and Options for Global Action Beyond 2012

IMF (2008)

World Economic Outlook, Chapter 4

Climate Change and the Global Economy

World Bank (2010)

World Development Report 2010

Development and Climate Change: Generating the Funding Needed for Mitigation and Adaptation

Smith School of Enterprise and the Environment
University of Oxford (2011)

International climate change negotiations: Key lessons and next steps

World Bank. (2010).
State and trends of the carbon market 2010.

Aldy, J. and Stavins, R. (eds). 2010.
Post-Kyoto International Climate Policy Research

Robert N. Stavins (2008)
“Addressing climate change with a comprehensive US cap-and-trade system”

United Nations (2010)
Report of the Secretary-General’s High-Level Advisory Group On Climate Change Financing

Frank Jotzo, Jonathan Pickering, Peter J. Wood (2011)
Fulfilling Australia’s International Climate Finance Commitments: Which Sources of Financing are Promising and How Much Could They Raise?

WBGU (German Advisory Council on Global Change) (2009).
“Solving the climate dilemma: the budget approach.”

WBGU.(2008)
German Advisory Council on Global Change
Solving the climate dilemma: The budget approach.

Global Commons Institute (GCI). (2008).
Carbon Countdown

Kanitkar, T. et al. (2010).
Conference on Global Carbon Budgets and Equity
in Climate Change.

Daniel Klinglefeld. (2010)
“EVALUATING GLOBAL CLIMATE POLICY. - TAKING STOCK AND CHARTING. A NEW WAY FORWARD”.

Edenhofer, O., N. Stern (2009).
“Towards a Global Green Recovery – Recommendations for Immediate G20 Action.” Report prepared on behalf of the German foreign office, April 2009.

IEA (International Energy Agency)/OECD (2002).
“Beyond Kyoto – energy dynamics and climate stabilization.” Paris, 2002.

Stern, N. (2006).

“The Economics of Climate Change: The Stern Review.”

Wicke, L. (2005).

“Beyond Kyoto – A New Global Climate Certificate System. Continuing Kyoto Commitments or a Global “Cap and Trade” Scheme for a Sustainable Climate Policy?”

Wicke, L. (2006).

“Beyond Kyoto 2012: No Prevention of Dangerous Climate Change Without an Internationally Acceptable “Beyond Kyoto” Global Cap-and-Trade Scheme.”

Edenhofer, O. Flachsland, C. Lessmann, K. (2011)

“Who Owns the Atmosphere, After the Climate summit in Cancun”

Tickell.(2007).

Kyoto 2: How to manage the global greenhouse

R.B. Dellink, S.Jamet, J.Chateau, R.Duval (2010)

“Towards global carbon pricing:Direct and indirect linking of carbon markets”

O. Edebofer, C.Flachsland, R. Marschinski (2007)

Towards a global CO2 Market

N. Hohne, S. Moltmann (2009)

WWF and Ecofys paper

Sharing the effort under a global carbon budget

WBCSD (2010)

Establishing a Global Carbon Market: A discussion on linking various approaches to create a global market