

## Climate policies in an adverse context: bringing research on finance and macroeconomics on board

Jean-Charles Hourcade<sup>1</sup>, Baptiste Perrissin Fabert<sup>2</sup>, Erik Haites<sup>3</sup>

The Durban Conference has acknowledged the failure of the international cap-and-trade paradigm embodied in the Kyoto Protocol. One reason for this failure is that it does not provide a palatable deal for developing countries given the reluctance of developed countries to grant large compensatory transfers (by means of financial aid or generous emissions caps) to offset the adverse effects of a significant carbon price on their middle classes and industries.

But, as the Durban decision notes, the current voluntary mitigation pledges yield global emission pathways that will hardly make it possible to hold the increase in global average temperature below 2 °C above pre-industrial levels. This confirms the necessity of a “paradigm shift” in international efforts to address greenhouse gas emissions. Such a shift must be perceived by developing countries as an opportunity for sustainable development, not a constraint on their development.

Over half of global greenhouse gas emissions now occur in developing countries and this share is expected to continue to increase. It is critical that much of the effort to reduce global emissions focuses on developing countries but equity (and the UNFCCC convention) dictates that industrialized countries provide incentives for mitigation efforts in developing countries.

Financial incentives are both the natural complement of and a transitory alternative to an international cap-and-trade regime. But according to the World Bank (WB 2010), the funding needed is up to several hundred billions of US\$ per year. This compares to total development assistance of approximately \$120 billion US\$ per year. A system of climate finance incentives several times larger than global development assistance funded from industrialized country government budgets is inconceivable given the large deficits faced by most of those governments.

Estimates of the international private finance currently provided for mitigation actions in developing countries range from \$55 to \$160 billion per year (Buchner et al. 2011; Stadelmann et al, 2011). Most mitigation options, such as renewable energy, energy efficient buildings and transport infrastructure are characterized by higher capital costs and lower operating costs than the conventional alternatives (World Bank, 2010; Haites, 2011). These higher upfront costs make low-carbon investments riskier and explain why appropriate investment incentives, as confirmed by the experience of the Clean Development Mechanism, are necessary to make them attractive to private sector.

The challenge, then, is to create incentives that significantly increase the scale of private investment in mitigation measures in developing countries without imposing a burden on the government budgets of industrialized countries which have been weakened by the financial crisis. Contributions from these budgets will still be needed to support adaptation measures in developing countries.

One possibility, which needs further research<sup>4</sup>, is to allow central banks in industrialized countries to create a quantity of carbon certificates that can be used by the banking system to back low carbon

---

<sup>1</sup> CIRED (International Center of Research on Environment and Development)

<sup>2</sup> CIRED, [perrissin@centre-cired.fr](mailto:perrissin@centre-cired.fr)

<sup>3</sup> Margaree Consultants Inc.

projects and to transform them into legal reserves as these certificates have produced “real wealth” (low-carbon equipment and infrastructure, associated emission reductions) without compromising the liquidity of the financial system.

Each participating industrialized country government would establish an overall limit on the value of carbon certificates (CC) available over a specified period (5 to 10 years). The value of the carbon certificates is calculated as the product of the Carbon Assets (CA) created – verified tons of CO<sub>2</sub> reduced by eligible mitigation projects – and an agreed social cost of carbon (SCC);  $CC = CA \times SCC$ .

An independent international Supervisory Body, similar to the CDM Executive Board, would determine eligible mitigation projects (size, technology, sector, time horizon) approve methods for monitoring their performance and calculating the emission reductions achieved, and confirm the emission reductions achieved based on verification reports by accredited independent bodies. The central bank of a participating country would deliver to investment and development banks carbon certificates for the verified emission reductions achieved by the mitigation projects they fund, subject to the overall limit on carbon certificates. Specifically, banks would receive carbon certificates equal to the verified emission reductions multiplied by the SCC.

This SCC would be negotiated by the governments of participating countries. The SCC is the value that equates the marginal cost of emission reductions with the marginal benefit of avoided climate damages, along an optimized growth trajectory (IPCC, 2007). Uncertainty about this value is very large but it is worth noting that the UK, the US, and France have already integrated a SCC into regulatory analysis of public investment decisions (2030 values are respectively US\$42, US\$33, and US\$130). Political agreement on a SCC should be easier than on a carbon tax or national emissions cap because it serves as a notional long term price for new investments without imposing a direct cost on the public budget, firms or consumers.

After their certification by the Supervisory Body, carbon certificates would be accepted by the central bank as legal reserves, so a bank could deposit them to its central bank account to comply with its reserve requirement and/or capital requirement<sup>5</sup>. These carbon-based reserves would be additional to usual central bank deposits and other reserve instruments. In the current period of deleveraging by the banking system the carbon certificates will encourage a bank to use these additional reserves to expand its lending activity and so stimulate economic growth instead of accumulating liquid reserves.

This mechanism would neither create liquidity problems nor result in lower protection of depositors in the event of run on the bank. First, carbon certificates would constitute a small share of total reserves; second, as a last resort, the central bank would redeem the certificates at face value, thus turning them into cash and making them as liquid as other reserves<sup>6</sup>. The risk of monetary inflation would be limited as long as a strict monitoring guarantees that the underlying low-carbon assets of this carbon-based money really increase total output.

Awarding carbon certificates for mitigation projects would shift funds away from other investments. This is a benefit; not a problem. The world has a vast pool of savings and a lack of productive investment opportunities (Krugman, 2008; Bernanke, 2005) leading to investment in speculative

---

<sup>4</sup> Such research program is detailed in (Hourcade et al. 2012)

<sup>5</sup> The carbon-based capital would be part of Tier 2 (supplementary) capital and not Tier 1 capital which consists mostly of shareholders' equity and disclosed reserves.

<sup>6</sup> We can imagine the development of a secondary market where carbon certificates are traded like any other liquid reserve asset. The price is likely to be close to the face value as ultimately they can only be redeemed by the central bank at their face value.

assets (including housing) and the creation of “bubbles”. Shifting some of the savings from such speculative investments to low risk mitigation projects such as industrial energy efficiency, energy efficient buildings, renewable energy sources, and waste management would yield both financial and environmental benefits (Zenghelis, 2011).

To mobilize funds, banks would create climate-friendly financial products to attract savings from households looking for safe and sustainable investments. The investments are safe because the value of the emission reductions is determined by the SCC, which is set in advance, and the emission reductions achieved are certified by an accredited independent body.

The proposed system could be launched unilaterally by a small group of willing countries. However, for reasons of credibility and efficiency implementation by a relatively large group of industrialized countries is preferable. This would mean a common value for the social cost of carbon and a single international Supervisory Body.

The proposed system would complement, rather than replace, the recently established Green Climate Fund. The Green Climate Fund is likely to receive most of its funds from budgetary contributions and small taxes on financial transactions, international shipping emissions and international aviation emissions. It could also receive part of the carbon assets. Since the proposed system increases private investment in mitigation measures, it would increase the leverage effect of highly rated “carbon based bonds” to attract institutional investors by offering a slightly higher return than regular safe bonds (De Gouvello and Zelenko 2010).

In summary, the proposed system would create a carbon price signal (through the SCC) while being politically acceptable because it does not impose direct costs on firms or consumers. It also stimulates mitigation efforts efficiently without imposing demands on industrialized country government budgets. It will also help to divert a share of private savings from speculative assets to productive low-carbon investments. Hopefully, the scale of this system could be large enough to make a significant contribution to the global mitigation effort and to stimulate economic growth.

Important knowledge gaps still have to be filled to make the proposal operational. We invite scholars in macroeconomics together with finance and money experts to delineate the systemic consequences of a carbon-based reshaping of international finance. New research is needed to link long run energy-economy models with short-medium term macroeconomic models which incorporate finance and capital flows. How the risk of inflation entailed by a climate-oriented monetary policy differs from the traditional “Keynesian compact” needs to be appraised given that the carbon certificates are backed by real assets, like gold in the past.

## References

B. S. Bernanke, 2005. "[The Global Saving Glut and the U.S. Current Account Deficit](http://www.federalreserve.gov/boarddocs/speeches/2005/200503102/default.htm)," speech delivered for the Sandridge Lecture at the Virginia Association of Economists, Richmond, March 10, [www.federalreserve.gov/boarddocs/speeches/2005/200503102/default.htm](http://www.federalreserve.gov/boarddocs/speeches/2005/200503102/default.htm). Similar remarks with updated data were presented for the [Homer Jones Lecture](http://www.federalreserve.gov/boarddocs/speeches/2005/20050414/default.htm), St. Louis, April 14, 2005, [www.federalreserve.gov/boarddocs/speeches/2005/20050414/default.htm](http://www.federalreserve.gov/boarddocs/speeches/2005/20050414/default.htm)

Buchner, B., Falconer, A., Hervé-Mignucci, M., Trabacchi, C. & Brinkman, M., 2011. The Landscape of Climate Finance. *Climate Policy Initiative, Venice, Italy*.  
<http://www.climatepolicyinitiative.org/genericdatas/view/publication/117>

De Gouvello, C., & Zelenko, I. (2010). Scaling up the Financing of Emissions Reduction Projects for Low Carbon Development in Developing Countries Proposal for a Low-carbon Development Facility. Policy Research Working Paper. World Bank.

*Haites, E. 2011. International financial support to address climate change. Climate Policy. Vol 11 N. 3*

Hourcade J.C., Perrissin Fabert B., Rozenberg J. (2012). Venturing into Uncharted Financial Waters: an Essay on Climate-Friendly Finance. *International Environmental Agreement: Politics, Law, and Economics*. Vol. 12, N. 2, pp. 165-186

IPCC. Climate change 2007: Mitigation. Contribution of working group III to the fourth assessment report of the intergovernmental panel on climate change. *Cambridge University Press, Cambridge, UK and New York, NY.*, 26.

P. Krugman, 2008. The return of depression economics and the crisis of 2008. Ed. W. W. Norton & Company, 2009. 224p.

LCS-RNET, 2011. Transition towards Low Carbon Societies in a Changing World: Science, Policy and Society for Low Carbon Development Pathways. Url: [http://lcs-rnet.org/publications/pdf/2011\\_3rd\\_Annual\\_Meeting\\_of\\_the\\_LCS-RNet\\_in\\_Paris.pdf](http://lcs-rnet.org/publications/pdf/2011_3rd_Annual_Meeting_of_the_LCS-RNet_in_Paris.pdf)

Stadelmann, M.; Michaelowa, A.; Butzengeiger-Geyer, S. & Köhler, M., 2011. Universal metrics to compare the effectiveness of climate change adaptation projects. *Colorado Conference on Earth System Governance*, 17-20

World Bank. 2009. World Development Report 2010: Development and Climate Change. Washington DC: The World Bank.

Zenghelis, D., 2011. A Macroeconomic Plan for Green Recovery. Policy Paper. Centre for Climate Change Economics and Policy. Grantham Research Institute on Climate Change and the Environment.