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Pricing Carbon: A Primer

By John Dillon

Of the many approaches to reducing greenhouse gas (GHG) emissions, two are market-based: cap-and-trade systems and carbon taxes. Both these proposals involve putting a price on carbon dioxide emissions as an incentive for companies and individuals to take steps to reduce the amount of GHGs they release into the atmosphere.

This briefing paper first describes how a cap-and-trade approach compares with carbon taxes. It goes on to examine some of the problems with cap-and-trade systems before describing some alternative approaches to GHG mitigation. Special attention is paid to considering the consequences of turning greenhouse gas emissions into a marketable commodity, especially for communities in the global South.

Cap-and-Trade

In a cap-and-trade system for reducing GHG emissions, governments put overall limits or "caps" on permissible emissions. Companies that emit less than their cap can sell emission credits to other companies in a market where the price for each tonne of carbon dioxide is set by supply and demand. Those who emit more than their limit must buy emission rights. The caps are supposed to be lowered over time as an incentive for companies to increase energy efficiency or install pollution abatement technology.

Emission permits can be allocated free of charge, auctioned off or sold for a set price. Emitters can trade emission rights among themselves or purchase "offsets" by investing in projects that are deemed to reduce GHG emissions by an equivalent amount. Offsets can be purchased either from domestic sources or international sellers. For example, industrial emitters can pay farmers in Alberta who engage in no-till planting $7.50 for each tonne of CO_2 deemed to remain sequestered beneath unploughed fields. Offsets from developing countries include production of crops for agrofuels, the installation of GHG capture technology at chemical factories, the burning of methane seeping out of a coal mine or waste dump, or the building of a wind-turbines.

Companies in industrial countries often prefer to invest in offsets abroad because they are less costly than taking action to reduce their own carbon emissions.

Carbon Taxes

A carbon tax is a levy on each tonne of carbon dioxide released that acts as an incentive for companies or individual consumers to take measures to reduce their emissions.

Two provinces, British Columbia and Quebec, have enacted small carbon taxes. But this option has virtually disappeared from the national debate due to the poor showing of the Liberal Party in the last election when leader Stéphane Dion campaigned on his *Green Shift* plan for a carbon tax counterbalanced by other tax reductions.

Since July 1, 2008 British Columbia has imposed a tax on all fossil fuels including gasoline, diesel, natural gas, coal, propane and home heating fuel. The rate started at $10 per tonne of CO_2e and increases by $5 a year over four years until it reaches $30 a tonne in 2012.

When B.C.'s tax reaches $30 per tonne in 2012 it will have increased gasoline prices by 7.24 cents per litre in 2012. Such a price increase will not by itself significantly influence driving habits in the short run. However, a $30 per tonne tax applied to an electricity generating company with substantial emissions costing millions of dollars a year could influence its decisions when it has to replace an aging coal-fired generator.[1]

A sustained and annually escalating carbon tax on the B.C. model would also eventually influence consumer choices concerning where to live or whether to replace an aging vehicle. Dale Marshall of the Suzuki Foundation points out that "When energy is more expensive (through a carbon tax), payback periods for insulation, solar hot water heaters, etc. get shorter, increasing their penetration, especially when it's mandated… [in] building codes."[2]

A global carbon tax on all CO_2 emissions could raise from US$130 billion to US$750 billion per annum depending on the tax rate.[3]

Some of the principal arguments concerning the relative merits of carbon taxes versus cap-and-trade systems are summarized below.

Relative Merits of Carbon Taxes Versus Cap-and-Trade Systems[4]

Proponents of carbon taxes claim 4 advantages over cap-and-trade systems:

1. Simple administration: duties on CO_2 emissions can be introduced through the standard tax system, with opportunities for evasion limited.

2. Limiting distortions caused by vested interests. As in any system of quota allocation, cap-and-trade systems are open to manipulation by vested interests. As one commentator has written, issuing allowances is "in essence printing money for those in control of the permits". Power companies, oil companies, etc. have undue influence in the quota system.

3. Price predictability. Carbon taxes directly influence the price of emissions in a predictable fashion. By contrast, cap-and-trade systems control the quantity of emissions. By fixing the quantity of emissions, such schemes will drive prices through whatever adjustment corresponds to the quota ceiling. Critics of cap-and-trade argue that quotas will accentuate energy price fluctuations, affecting business investment and household consumption decisions.

4. Revenue mobilization. Carbon taxation has the potential to generate large streams of revenue. Because the tax base for carbon levies is so large, even a modest tax could deliver considerable amounts. In the early 1990s, Norway introduced a carbon tax on energy which generated almost 2 % of GDP in revenue.

Proponents of cap-and-trade systems counter with the following arguments:

1. Administrative complexity difficulties have been overstated. The concentration of CO_2 emissions in large-scale power plants and carbon-intensive industries makes it possible to operate cap-and-trade systems through a relatively small number of enterprises.

2. While price volatility is a challenge in cap-and-trade systems it is important not to over-emphasize the differences. If the policy aim is to achieve quantifiable emissions reductions, then carbon taxation will have to be constantly adjusted in the light of outcomes.

3. Cap-and-trade programs can also generate revenues, provided that permits are auctioned. Transparent auctioning offers several advantages apart from revenue mobilization. It enhances efficiency and reduces the potential for lobbying by vested interest groups, addressing two of the major drawbacks with quota systems.

4. Cap-and-trade offers greater environmental certainty. Strict enforcement of the quota guarantees a quantitative limit on emissions.

5. Cap-and-trade enables market actors, through supply and demand, to find the lowest cost GHG emission reductions first, thereby maximizing the environmental impact of spending to address climate change.

Cap-and-Trade: **Purchasing the Right to Pollute?**
KAIROS partners from the Global South have raised a number of fundamental critiques of cap-and-trade systems. They say emission rights create a new form of private property rights over the Earth's carbon absorption capacity, which should properly be seen as a public good. Rather than applying the "polluter pays" principle, offset purchases are seen as schemes by which polluters buy the "right" to go on polluting.

Their most fundamental criticism is that carbon trading allows fossil fuel extraction to continue. Cap-and-trade, with its emphasis on offsets, gives fossil fuel industries an incentive to delay making changes in harmful practices.

An Oilwatch International declaration, *Climate Change: The Challenge to Sustainable Development* states:
"The carbon market is simply the purchase of carbon absorption capacity and the consequent sale of emission rights of CO_2….This new and flourishing market is not aimed at reducing the burning of fossil fuels - which are the main cause of global warming- but to the contrary, it will allow further consumption."

Similarly, several KAIROS partners helped to author the *Bali Declaration on International Financial Institutions, Debt and Climate Change*:
"We oppose carbon trading as a false solution that allows transnational corporations and rich countries to buy the right to pollute at the expense of impoverished peoples and countries. Worse, carbon trading has spawned new and despicable instruments to extract profits from pollution…"

Carbon trading is seen as a form of 'greenwash' that distracts from the serious task of tackling unsustainable consumption patterns and making changes to current practices in resource extraction, production, and waste disposal.

Profiting from Pollution
The carbon emission market is controlled by some of the same interests which designed the out-of-control financial innovations that led to the current economic crisis. Financial traders at the Chicago Board of Trade and bureaucrats at the World Bank pioneered carbon trading.

As of 2008 there were around 80 carbon investment funds set up to finance offset projects or buy carbon credits. Much of their activity is speculative rather than helping companies comply with carbon reduction obligations. The carbon market imitates some of the same obscure and complex instruments that contributed to the collapse of financial markets. Disparate projects are bundled together and sold in packages. For example, "In November 2008 Credit Suisse announced a securitized carbon deal that would bundle together carbon credits from 25 offset projects at various stages of UN approval, sourced from three countries and five project developers."[5]

There is thus serious potential for carbon markets to become an out-of-control, multi-trillion-dollar speculative bubble, similar to the subprime mortgage bubble that brought on the 2008 financial crisis. Carbon trading already involves transactions worth "over US$100 billion yearly and [is] projected to rival the financial derivatives market, currently the world's largest, within a decade."[6] The international market for carbon trading is forecast to be worth an extraordinary US$3 trillion by 2020 if the US becomes a full participant.[7]

Carbon prices fluctuate widely. The European price fell by half in a short period during April, 2006, due to the fact that the European Union's Emissions Trading System (ETS) had issued more permits than were needed to cover current emissions. Carbon trading during the first 3 years of the ETS did little to reduce overall emissions, but it did generate very large profits for some. In the power sector in particular, companies were able to cover their emissions through free quotas, pass on costs to consumers and benefit from market opportunities to trade excess quotas. The United Kingdom Government estimates that large electricity generators gained £1.2 billion (US$2.2 billion) in 2005 alone. A study by Europe Economics estimates that the windfall for power generators across the EU amounted to €6 to €8 billion over 2005-07.

The *Wall Street Journal* has said that emissions trading "would make money for some very large corporations, but don't believe for a minute that this charade would do much about global warming." The paper termed the carbon trade "old-fashioned rent-seeking … making money by gaming the regulatory process."[8]

Scams are easy to perpetrate in the offsets market. *The Globe and Mail* cites the manager of Greenhouse Gas Emissions Management Consortium of Vancouver as

saying the same credits can be sold to different buyers "I have seen offsets sold three or four times."[9]

Simon Fraser University's Mark Jaccard has called cap-and-trade a growth industry for lawyers, accountants and lobbyists and a clumsy, roundabout method for curbing emissions.[10]

Cap-and-Trade in Relationship to the UN Negotiations on Climate Change (UNFCC)

The place of market-based mechanisms such as cap-and-trade in the international negotiations on climate change is highly contested by many southern civil society organizations. The market is seen to be the main strategy by which the Global North intends to fund both their weak mitigation efforts and the cost of adaptation for countries in the Global South.

A clear North-South divide was apparent in negotiations held in October 2009 in Bangkok in preparation for the final talks scheduled to take place in Copenhagen in December. Bangladesh, speaking on behalf of the least developed countries that are already experiencing population displacements due to floods, droughts and rising sea levels, called for adaptation funding equal to 1.5% of developed countries' GDP [approximately US$585 based on 2007 GDP for all OECD members.]

Martin Khor of the South Centre says the developed countries are trying to shift the burden of paying for adaptation onto developing countries and are resisting the creation of a fund that would be managed by the UN. The UN says US$500-600 billion a year in funding would be needed for mitigation and adaptation by developing countries. Another study says US$500 billion a year is needed for adaptation alone.

The US, European and Canadian governments are refusing to make substantial financial commitments for funding climate mitigation and adaptation in the South. Instead they are insisting on "market-based" solutions, including raising money from sales or auctions of emission permits and encouraging Northern companies to invest in offset projects in the South. Under this scenario developing countries would have to agree to participate in a global carbon market in order to ensure that some funding might come their way.

During the Bangkok discussions Canada defended a market-based solution, saying it was "false argument" to suggest that the public sector should be the main source of finance.[11] A background paper prepared for the G20 Pittsburgh summit calls global carbon markets a "central vehicle" for mobilizing capital to fight climate change. However, no decisions were taken at Pittsburgh (presumably due to opposition from Southern members of the G20). Instead the G20's Finance Ministers were asked to "report back at their next meeting with a range of possible options for climate change financing to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen."[12]

Origins of Cap-and-Trade in the Kyoto Protocol

It is important to note that prior to the Kyoto Conference of the Parties of the UNFCCC
a market-based cap-and-trade system was not a preferred option for dealing with GHG emissions. On the table at Kyoto was a Brazilian proposal for a Clean Development Fund which would be a type of "cap-and-tax" proposal. The Clean Development Fund would collect payments from industrialized countries that exceed their emission targets and use the funds to finance clean energy initiatives in the South. But the US delegation at Kyoto, led by then Vice-President Al Gore, refused to go along, preferring a cap-and-trade system. Reluctantly, the Europeans went along with this proposal in an attempt to keep the US on board, which in the end proved futile as the George W. Bush administration subsequently refused to implement the Kyoto accord.

As a result, the Kyoto protocol incorporated two mechanisms for emissions trading:

- The Clean Development Mechanism (CDM), which is specifically designed to facilitate trading of carbon offset credits between industrial countries and developing nations.
- The Joint Implementation (JI) mechanism, which allows industrialized nations to trade emission rights among themselves.

The CDM's track record is problematic. A United Nations Development Program report cites problems concerning "the authenticity of CDM emission reductions. Rules governing the arrangement require that emission reductions are 'additional'—that is, they would not have happened in the absence of CDM investments. In practice, this is difficult to verify. … [S]ome CDM credits have been acquired for investments that would have taken place anyway."[13]

There is mounting evidence that many CDM projects do not meet the 'additionality' test:

- A UN investigation found that up to 20% of the credits sold under the CDM were faulty and 3 of the 17 companies charged with validating and verifying that projects do indeed represent additional emission reductions that would not happen in the absence of CDM credits were grossly incompetent.[14]

- Most Chinese hydro projects and half of India's CDM projects have been assessed as not providing additional emission reductions.[15]

- A US General Accounting Office study concluded that it is impossible to know with certainty whether any given offset is additional.

- A Stanford University study found that between one-third and two-thirds of all CDM offsets do not represent real, additional emission cuts.[16]

In 2005, 67% of all CDM credits were for the capture and destruction of one kind of greenhouse gas, a hydrofluorocarbon called HFC-23, a byproduct of the production of a common refrigerant. The proportion of credits attributed to HFC-23 destruction fell to 34% in 2006 but credits for capturing HFC-23 and nitrogen oxide (N_2O) together still accounted for almost half of all credits. Meanwhile investments in energy efficiency and renewables accounted for just 21% of CDM credits. Credits for destroying HFC or N_2O do not reduce fossil fuel use. In fact these and other offsets allow the burning of fossil fuels to continue.[17]

The *Financial Times* reports that some purchasers pay for emission reductions that don't take place or for cleanups that would have happened anyway. A *Financial Times* investigation also found that many projects are not professionally verified in part because there is a shortage of skilled technicians to verify them.[18] *Newsweek* magazine's investigation of the Clean Development Mechanism concluded "It isn't working . . . [and represents] a grossly inefficient way of cutting emissions in the developing world." The magazine called the trade "a shell game" which has transferred "$3 billion to some of the worst carbon polluters in the developing world."[19]

The harshest criticisms of CDM offset purchases involve projects that violate the human rights of poor and marginalized groups. For example, the availability of emission credits led to keeping open the Bisasar Road Landfill in Durban, South Africa despite severe health problems it caused for people living nearby.

Another example is the Swasti run-of -river hydroelectric project in India that would destroy local farmers' customary irrigation system that provides food crops even when rainfall is irregular.[20]

Many of the offsetting projects - such as monoculture timber plantations, forest "protection" and landfill methane-electricity projects - have devastating impacts on local communities and ecologies. Tree plantations marketed as beneficial for the climate have seen people in the South expelled from their lands.

Before Canada and the US sanction the purchase of offsets from Mexico under a North American carbon trading system, the experience of a community called La Ventosa located on the Tehuantepec isthmus must be taken into account. A consortium of Spanish firms setting up wind turbines is accused of deceptive practices resulting in the displacement of people from their lands and payment of very low rents amounting to just 1,300 pesos a year – equivalent to just US$95.[21]

Neither have Joint Implementation projects made a significant contribution to emission reductions since most JI projects involve the purchase of credits from former Soviet Union countries. These emission reductions are an indirect and unintended consequence of the closure of industrial installations following the collapse of centrally planned economies. As such they should not count as real reductions to reduce the danger of climate change.

Alternatives

The **Climate Justice Now!** Coalition, comprising mostly Southern voices (many of whom are KAIROS' global partners), calls for the following solutions:

- *Reduced consumption;*
- *huge financial transfers from North to South based on historical responsibility and ecological debt for adaptation and mitigation costs*
- *leaving fossil fuels in the ground and investing in appropriate energy-efficiency and safe, clean and community-led renewable energy;*

- *rights-based resource conservation that enforces Indigenous land rights and promotes peoples' sovereignty over energy, forests, land and water; and*
- *sustainable family farming and peoples' food sovereignty.*

If countries intend to be serious about tackling climate change, market mechanisms can only pay a marginal role. A well-designed carbon tax or a cap-and-tax approach has a greater chance of success. However, such measures must be accompanied by other regulations that ensure deep emission cuts in consumer behaviour such as vehicle emission standards, building codes, conservation measures and support for development of clean, renewable forms of energy.

There are other alternatives to raising funds than carbon trading. In addition to the Brazilian proposal that preceded the Kyoto conference, NASA's James Hansen recommends a carbon fee that would rise over time and be applied where fossil fuels are extracted or imported. The revenues would be publicly managed and used for conservation or renewable energy projects and used to offset the additional costs born by those who have a below-average carbon footprint.

Putting firm caps on GHG emissions from large industrial emitters need not necessarily be linked to carbon trading systems. As Marjorie Griffin Cohen of Simon Fraser University states, "In order to eliminate the massive pollution of rivers that characterized early modern industry, governments did not introduce taxes or elaborate toxic substance trading schemes. Rather they simply prohibited the dumping of toxic substances into rivers."[22]

Carbon Taxes and Protection of Low-income Earners

A major concern is that carbon taxes are regressive when applied across the board to consumer purchases because low-income earners spend a higher portion of their income on energy than do the wealthy. In Canada the poorest fifth spend 13% of their income on energy bills while other Canadians expend just 4%. A more progressive option is to tax or fine petroleum companies, tar sands operators, coal-fired utilities, oil refiners and fuel importers or wholesalers directly.

The regressive impact of carbon taxes can be reduced through rebates. For example, when B.C. introduced its carbon tax it also included a one-time $100 Climate Action Dividend payable to every British Columbian resident "to encourage the transition to a greener lifestyle." There is also another Climate Action Credit provided to low-income British Columbians worth $100 per adult and $30 per child per year starting in July, 2008 and increasing by $5 in 2009.

Another option is to implement a comprehensive poverty reduction plan funded through a fair taxation system in conjunction with introducing a carbon tax.

Conclusion

The Canadian government intends to make cap-and-trade a central element of Canada's climate policies. However, the design of a Canadian system has yet to be determined since Ottawa wants to harmonize Canada's system with whatever emerges in the US. Environment Minister Jim Prentice foresees an integrated North American carbon market where Canada and the US would recognize each other's offset credits and probably allow for the purchase of offsets from Mexico where they are expected to be less expensive.

A Canadian cap-and-trade system harmonized with a similar system in the US is unlikely to achieve significant GHG reductions. As the box on the US Congressional debate shows, the targets will be too low; too many emission permits will be given away; and too many offset credits can be purchased abroad. Turning emission rights into a marketable commodity transforms a public good, the Earth's carbon absorption capacity, into another form of private property. This paper has described how offset purchases from Southern countries are fraught with many problems. There are serious concerns with making cap-and-trade systems the central element in Canadian climate change policy where other better alternatives exist.

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KAIROS: Canadian Ecumenical Justice Initiatives unites eleven churches and religious institutions in work for social justice in Canada and around the globe.

US Debate on Climate Legislation

President Obama favours a cap-and-trade system but its design awaits passage of an energy bill by Congress. While the final details of a US system is yet to be determined its essential elements are contained in the Waxman-Markey bill passed by the House of Representatives in June. A similar bill is now before the Senate where the House bill is likely to be weakened due to stiff opposition from Republican Senators, some of whom reject cap-and-trade entirely, and from Democratic Senators from coal-producing and manufacturing states. Civil society organizations find these bills deeply flawed and troubling.

The Waxman-Markey bill in its present form has enormous loopholes that would allow the most polluting industries to avoid real emission reductions. One concern is that the reduction target is quite modest. Whereas science calls for industrialized states to reduce GHG emissions by at least 25-40% below 1990 levels by 2020, Waxman-Markey aims at only a 17% reduction below 2005 levels by 2020. [The initial draft of a Senate bill calls for deeper emission reduction – 20% below 2005 levels by 2020. But one of its sponsors, Senator Barbara Boxer, suggests this could be watered down.] This is similar to the Canadian government's goal to reduce emissions to 20% below their 2006 levels by 2020.

Another major flaw is that 80 to 85 percent of the emission permits would be given away free to emitters. As a result many polluters would not have to pay a price for continuing to emit GHGs and consumers would have no incentive to reduce their consumption.

The Waxman-Markey bill would allow emitters to purchase up to 2 billion tonnes in offsets. "This 2bn-tonne offset allowance exceeds all the carbon reductions envisaged between now and 2040."[23] By purchasing offsets overseas the US could hypothetically achieve its reduction target without closing a single coal-fired plant. [A recent report indicates that the Senate version might limit the amount of non-US offsets emitters can use for compliance.]

NASA scientist James Hansen calls the Waxman-Markey bill a "Ponzi-like" scheme in that sellers of credits could earn high monetary returns without any obligation to actually reduce their GHG emissions. He cites a former US Undersecretary of Commerce who says it "has no provisions to prevent insider trading by utilities and energy companies or a financial meltdown from speculators trading frantically in the permits and their derivatives."[24]

Analysts predict that the Waxman-Markey bill is unlikely to result in a CO_2 price high enough to discourage fossil fuel dependence. Moreover, "Under the Waxman-Markey Act US emissions would not dip below 2005 levels until 2026 thanks to billions of tonnes of offset credits bought from abroad."[25]

The preference of US politicians for cap-and-trade over carbon taxes prevails despite a February 2008 study by the Congressional Budget Office that found that "the net benefits of a [carbon] tax could be roughly five times greater than the net benefits of an inflexible cap. Put another way, a given long-term emission-reduction target could be met by a tax at a fraction of the cost of an inflexible cap-and-trade program."[26]

Endnotes

[1] In a debate at the St. Lawrence Forum In Toronto on April 9, 2008 Toby Heaps, former editor of Corporate Knights magazine, made the latter point while Hugh Mackenzie from the Canadian Centre for Policy Alternatives cited data on how adding 7 cents to the cost of a litre of gas does not influence driving habits..

[2] e-mail from Dale Marshall sent to Climate Action Network list serve. April 15, 2008.

[3] see Foster, John W. and Schmidt, Rodney. "Innovative Financing" in Lois L. Ross, Ed. *Canadian Development Report 2009* – Financing Development in Times of Global crisis. Ottawa: North South Institute. Chapter Two. 2009. Page 39.

[4] The material on this page is cited almost verbatim with some minor editing from "Fighting Climate Change: Human Solidarity in a Divided World." *Human Development Report 2007/2008*. New York: United Nations Development Program. Chapter 3. Pages 126-127.

[5] Lohman, Larry. "Neoliberalism and the Calculable World: The Rise of Carbon Trading." The Corner House. July 2009, Page8.

[6] Ibid. Page 2.

[7] Cited in the *Financial Times* May 26, 2008.

[8] Cited in "From False to Real Solutions for Climate Change" MRZine January 6, 2008.

[9] cited in *The Globe and Mail*, July 14, 2007.

[10] cited in Brethour, Patrick "Cap-and-trade system sets the belching bar low" *The Globe and Mail*. November 23, 2007 B2.

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[14] Bretton Woods Project Update, July 2, 2007 citing *The Guardian*.

[15] Lohman, Larry. "When Markets are Poison." The Corner House. September 2009, 53 at http://www.thecornerhouse.org.uk/pdf/briefing/40poisonmarkets.pdf

[16] Cited in *The Role of Carbon Markets in Countering Climate Change*. London: Christian Aid. August 2009.

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[20] Lohman, Larry. "When Markets are Poison." The Corner House. September 2009. at http://www.thecornerhouse.org.uk/pdf/briefing/40poisonmarkets.pdf Page 48.

[21] Israel Rodríguez. Israel. "Critica Greenpeace de España la doble moral de Endesa, Unión Fenosa y Repsol." *La Jornada*, 15 de febrero de 2009.

[22] Griffin Cohen, Marjorie. "Will BC's carbon tax actually reduce emissions?" in rabble.ca. Feb. 20, 2008.

[23] Luce, Edward. "Obama's cap and trade troubles." *Financial Times*, June 2, 2009.

[24] Hansen, James. "G-8 Failure Reflects US Failure on Climate Change." *The Huffington Post*, July 10, 2009.

[25] Lohman, Larry. "Neoliberalism and the Calculable World: The Rise of Carbon Trading." The Corner House. July 2009, 43. at http://www.thecornerhouse.org.uk/pdf/document/Neolib&Calc.pdf

[26] Congressional Budget Office. *Policy Options for Reducing CO2 Emissions*. Washington: Congressional Budget Office. 2008. Page ix.