

More is less: a case against sectoral carbon markets

The global carbon market is in crisis.¹ Proposed emissions trading schemes in the USA, Japan and Canada have stalled indefinitely; new markets in Australia and South Korea face significant delays; and climate justice activists have successfully blocked the start of a planned scheme in California. Trading has become ever more concentrated around the EU Emissions Trading System (ETS), which could well see carbon permit prices drop to zero if the 27-country bloc adopts stricter guidelines on energy efficiency.² Overall carbon trading volumes were lower in 2010 than in the previous year, and are predicted to stagnate in subsequent years; and the Clean Development Mechanism (CDM) has declined for four years running, with fewer credits purchased from new projects than at any time since the Kyoto Protocol came into force in 2005.³

Perhaps confusing these contractions for birth pangs, there is currently a push to create new international carbon market mechanisms in the context of United Nations Framework Convention on Climate Change (UNFCCC) international climate negotiations. The World Bank is offering further encouragement, in the guise of a new Partnership for Market Readiness (PMR) to promote carbon markets in middle-income countries.

This report critically examines the reasons behind and potential consequences of creating new carbon market mechanisms. In particular, it focuses on “sectoral” carbon markets, which would move beyond the project-by-project basis of the CDM and issue carbon allowances in relation whole sectors of the economy.



Going sectoral

Sectoral carbon markets are at the centre of UNFCCC discussions on new carbon market mechanisms, following considerable efforts by the European Commission, in particular, to promote them.

Various proposals are on the table, which can be classified as either “sectoral crediting” and “sectoral trading”. The former would issue “credits” for reductions in pollution relative to a projected baseline, based on measurements over an agreed time period. The latter would issue “permits to pollute” up front, in relation to a target level of emissions. The first part of this report explains how each scheme would work, and identifies some of the remaining unanswered questions about their scope and the means of governance. The second part focusses on the potential problems that such mechanisms pose. In particular, it assesses these mechanisms in terms of environmental integrity and their ability to deliver climate finance.

A key argument raised in favour of sectoral carbon markets is that they would increase the scope of action to mitigate climate change, by shifting from the current system of project-based offsets to a market that covers whole economic sectors. It cannot be assumed that a broader scheme will yield significant emissions reductions, however. One of the most notable effects of the CDM has been to delay action in industrialised countries by offering a cheap means for companies and

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governments to buy their way out of their obligation to cut greenhouse gas emissions at source. Offsets do not reduce emissions - they simply move them around. Given the complexity of the scheme, its capacity for gaming, and the very high prevalence of “non-additional” emissions saving projects (those which would have happened anyway) the net effect has been to increase emissions. An extension of carbon crediting from a project-by-project basis to whole economic sectors could reproduce the problems of existing offset schemes on a larger scale.

In answer to this claim, proponents of sectoral market mechanisms claim that these would move “beyond offsetting” by requiring Southern countries to achieve a level of reductions before any carbon credits are issued.⁴ This does not actually solve the problem, however. In the first place, the net effect of the new mechanisms would still be to expand the scope of carbon offsets. Moreover, in so far as the gap between the claimed reductions and the “crediting threshold” assumes that Southern countries take their own “unsupported” actions to mitigate climate change, the crediting mechanism would further offload responsibility for emissions reductions from industrialised countries to the global South. This is also true of sectoral trading mechanisms when they are embedded within Nationally Appropriate Mitigation Actions (NAMAs), the programmes of greenhouse gas emissions reductions that Southern countries report to the UNFCCC as part of their international climate change commitments.

The financial basis for introducing new market mechanisms is equally contentious. Although the new schemes are presented as distributing the benefits of carbon finance more evenly in the South, it is more likely that such schemes could benefit large (often transnational) corporations operating in middle-income countries. The reasons for this, explained below, relate to the market fundamentals of key economic sectors; as well as inequalities of information and capacity to engage in non-project-based trading systems. Beyond the “development financing” rhetoric, this is an intended effect on the part of those promoting these schemes: to draw so-called “major emitters” into climate change mitigation obligations, and so redress perceived trade imbalances resulting from measures to tackle greenhouse gas emissions. The assumptions used to justify carbon markets as a source of new climate finance are also questionable – a lack of demand for the credits issued could lead to a significant shortfall in revenues for Southern countries.

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It should be noted, finally, that the environmental and financial arguments on sectoral mechanisms do not tell the whole story, since such measures could have damaging social impacts. Carbon offset projects under the CDM have often resulted in land grabs, spread local environmental and social conflicts, and led to the repression of local communities and movements.⁵ The CDM project approval process allows little space for the voices of Indigenous Peoples and local communities – in fact, no project has ever been rejected on the grounds of rights violations, despite these being widespread.

It is too early to predict the precise impacts of sectoral carbon markets. It is significant, however, that the framing of the discussion on these new mechanisms excludes reference to their social impacts.

The UNFCCC is currently discussing new market mechanisms in response to Section 1(b)(5) of the 2007 Bali Action Plan, which calls for “Various approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions.”⁶ This Plan forms the basis of current international climate negotiations in the Ad Hoc Working Group on Long Term Cooperative Action (LCA), which is discussing a treaty that would supplement (or succeed) the 1997 Kyoto Protocol.

The Cancún Accords ask that new market and non-market mechanisms be considered for agreement, which resulted in a short consultation process early in 2011. In March, the LCA Secretariat issued a “Synthesis report on information on various approaches in enhancing the cost-effectiveness of, and promoting, mitigation actions ” (hereafter, “LCA *Synthesis Report*”), which puts together the results of this consultation. This document is presented as a basis for further negotiations, with a view to reaching an agreement at COP17 in Durban in December 2011.⁷

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If carbon markets are the “answer”, we would do well to ask: what is the question? In drawing up its synthesis, the LCA secretariat has considerably narrowed the scope of the discussion on market mechanisms by defining these as “an infrastructure for trading emissions”, in an apparent attempt to close off other options such as feed-in tariffs.⁸ It has also interpreted its remit in a way that reduces the debate on new market (and non-market) mechanisms to two criteria: “the first being whether they ‘enhance the cost- effectiveness of mitigation actions’ and the second being whether they ‘promote mitigation actions’.”⁹

Sectoral crediting

The *Synthesis Report* explains sectoral crediting in the following terms:

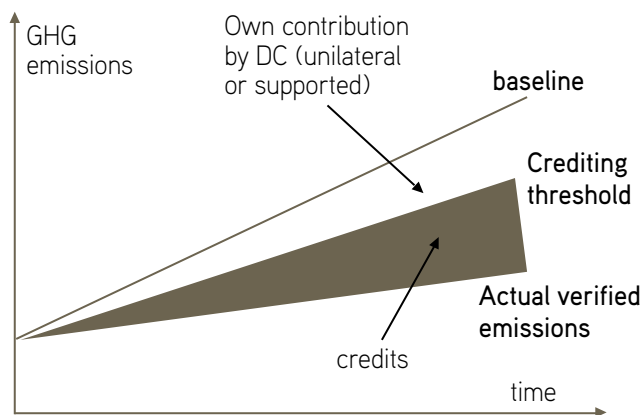
*On a crediting basis, a reference level for emissions within a boundary (e.g. a sector) would be determined, possibly at a level below ‘business as usual’. The emissions within this boundary would then be monitored during a period of time, known as a ‘reference period’. If, at the end of the reference period, actual emission levels were below the reference level, a quantity of credits corresponding to the difference would be issued. These credits would then be distributed, through a method to be determined, among the emitters within this boundary. The emitters would therefore have an incentive to limit their emissions, as this would enable them to gain credits that could be monetized. A variant of this proposal would be that credits are issued for emissions that are avoided during the period.*¹⁰

This requires a little decoding, starting with the obvious question of what activities would be covered? Although the precise list of sectors is not yet fixed, it is generally understood to include manufacturing sectors exposed to international competition – including steel, cement and lime, pulp and paper, and aluminium, “upstream” oil and gas production emissions (e.g. from gas venting and flaring) – as well as the power sector.¹¹ Such crediting may also include economic sub-sectors (e.g. public transport).¹²

Separate discussions are being held within the context of UNFCCC negotiations regarding deforestation and agriculture.¹³ Some international agencies, most notably the FAO, and corporate lobbyists (eg. Business Europe) wish to see these included within the framework of any new sectoral crediting or trading mechanism, although reservations on this have been expressed even by parties (such as AOSIS) that support the principle of new sectoral mechanisms.¹⁴ Emissions trading is also under consideration in the aviation and shipping sectors, although these discussions are currently being conducted under the mandate of the International Civil Aviation Organization (ICAO) and of the International Maritime Organization (IMO), institutions that have avoided binding agreements to control climate change for over 13 years.¹⁵

The *Synthesis Report* is also (deliberately) vague on how emissions would be counted and credits issued, although the “baseline-and-credit” system on offer is similar in many fundamental aspects to the CDM. A baseline or “reference level” is a projection of future emissions, which incorporates assumptions about past polluting practice, future economic growth and the likely trajectory of technology development. Minor alterations to these assumptions can result in major differences in how many credits are issued and, therefore, how much money is generated by the scheme.

One of the most controversial aspects of the proposed mechanism is the suggestion that crediting should start at a threshold that is “possibly at a level below ‘business as usual.’” This distinction has been vigorously promoted by the European Commission, which offers the following graphic to explain it:



Source: European Commission (2011)¹⁶

The gap between the BAU scenario and the baseline for crediting represents “verified” emissions reductions for which carbon credits are not issued. According to the European Commission, this entails a move “beyond offsetting” that clearly distinguishes sectoral crediting from the existing CDM. Sectoral crediting would require Southern countries to significantly alter their emissions trajectory *before* carbon credits are issued. In this sense, the scheme is said to advance beyond the “zero sum” game of the CDM, where all of the credits issued simply prevent more expensive actions to reduce greenhouse gas emissions in industrialised countries.¹⁷

The move “beyond offsetting” is far from eliminating offsetting or any of the problems associated with it, however. In covering whole economic sectors instead of individual projects, sectoral crediting would increase the volume of carbon offsets generated: in fact, that is one of its main goals.

Limiting the flow of offsets by means of a “crediting threshold” ... has the potential to displace more of the costs of addressing climate change onto countries of the global South

No penalty is incurred by the developing country if this threshold is not met, which is why the scheme is sometimes referred to as involving a “no lose” target.¹⁸ No credits are issued in this scenario, however.

If the emissions threshold is exceeded, credits are issued to the Southern country. These can then be sold back to industrialised countries (and companies covered by emissions trading schemes within these countries) as offsets. In other words, these credits are bought so that companies and governments in industrialised countries do not have to reduce their emissions at source.

The threshold could be established either in relation to an absolute volume of emissions (estimates of greenhouse gases output), or in relation to an intensity-based target. Intensity targets include, for example, measures of emissions per unit of GDP, or emissions per unit of electricity generated.¹⁹

Limiting the flow of offsets by means of a “crediting threshold” is, in part, a measure to “ensure that the supply of credits does not overwhelm demand.”²⁰ It is, moreover, a proposal that has the potential to displace more of the costs of addressing climate change onto countries of the global South.²¹

This is particularly apparent in cases where sectoral crediting forms part of how NAMAs are calculated. Bolivia has pointed out that “NAMAs must be by definition supported NAMAs,” a reference to the Bali Action Plan, which defines NAMAs as self-initiated actions by developing countries.²² Attaching NAMAs to a crediting mechanism deliberately blurs this distinction, as does the “layering” of NAMAs into three categories:

- *Unilateral NAMAs*: actions implemented unilaterally by a country, drawing on its own resources;
- *Supported NAMAs*: additional actions supported by financial or technology transfers and capacity building
- *Credited NAMAs*: the proportion of “below baseline” emissions that receive credits which can be sold through the carbon market

This layering has proven to be highly controversial within climate negotiations. Brazil and China, amongst others, have criticised it as a rewriting of the Bali Action Plan, and questioned plans to link NAMAs to carbon offsets. If the autonomous efforts of Southern countries are linked to an offset market, it is feared that low-cost emissions reduction potential would be counted towards Annex I country targets rather than as part of the effort by countries in the global South to advance down cleaner development paths.²³

What is currently on the table adopts precisely this type of approach, but wraps it up in the terminology of “sectoral crediting” and “new market mechanisms” – which would contribute to and be governed by the NAMA reporting requirements proposed as part of the 2007 Bali Action Plan.²⁴

This reflects a further bias in the *LCA Synthesis Report*. The means of issuing credits from sectoral crediting mechanisms, and the governance structure associated with them, have yet to be defined, but two main options are proposed. The first of these would involve the creation of a new international crediting body to oversee the mechanism, a structure similar to the existing CDM Executive Board. The second option, meanwhile, envisages that the UNFCCC provides guidance and support for rule harmonisation and standards for markets that are established nationally or bilaterally – and, crucially, legitimises the use of such credits towards global emissions reductions targets.

The experience of existing cap and trade schemes shows a consistent pattern of over-allocation and has tended to involve free handouts of permits to pollute

Other forms of sectoral crediting

A number of other variants on sectoral crediting exist. Without offering an exhaustive list, two key proposals stand out.

The first suggests that carbon credits might be issued for the implementation of “climate friendly” policies in Southern countries.²⁵ To add to the terminological confusion, this approach is sometimes referred to as NAMA crediting – the idea being that a certain quality of carbon credits be issued for policy measures carried out in relation to NAMAs.²⁶

This **policy-based crediting** would award carbon credits for successfully implemented mitigation policies. For example, if a Southern country were to adopt a renewable energy feed-in tariff to its electricity grid, it would be awarded with carbon credits. As with other offsets, a form of “additionality” claim would still apply. For example, assuming that the policy would not have happened anyway, credits would be issued for “each kWh that benefits from the tariff and multiply the total with the respective grid’s average emission factor.”²⁷ In so doing, policy-based NAMA crediting could transform proactive initiatives in Southern countries into new ways of helping Northern industrialised countries to carry on polluting.²⁸ It might also prove to be a perverse incentive to delay or prevent the introduction of environmental regulations and performance standards, in anticipation that a pro-active stance now would reduce the prospect of policy-based crediting later.

The second proposal, which could run in conjunction with sectoral crediting schemes, involves discounting credits. The basis of existing offsetting is the claim that a ton of carbon is the same wherever it is reduced and that, therefore, shifting reductions to the South is cost-effective. This interpretation has been challenged on the grounds that making the “cheapest” changes first can “lock in” fossil fuel infrastructure and delay more structural changes that are needed to tackle climate change.

Under a **system of discounting**, credits issued under sectoral or NAMA crediting schemes would be worth proportionately less than the pollution that they theoretically “offset.” For example, four credits would be awarded for every five tonnes of “avoided CO₂” below an agreed baseline. This could be applied in relation to absolute or intensity targets. Alternatively, credits could be “discounted” on the demand side: in other words, a business covered by a cap-and-trade system (such as the EU Emissions Trading System, EU ETS) would need to buy five sectoral credits if surrendering these instead of permits issued within the ETS.²⁹

The use of discounting may also be used in the context of reforms to the CDM to extend the lifespan of the issue of carbon credits for areas beset by controversy – most notably, in the case of HFC (refrigerant gas) projects.³⁰

Sectoral trading

Sectoral trading is a form of “cap and trade” scheme, similar in structure to the EU ETS. It aims to apply a cap (or limit) on greenhouse gas emissions relating to a particular economic activity. Companies are issued licenses to pollute (“carbon permits” or “emissions allowances”) and can then choose to cut their emissions, or to buy permits from others that have a surplus (“a trade”).

There are two key differences between sectoral trading and sectoral crediting. First, the issuance of allowances happens at the start of the period of trading, rather than at the end. If an agreed overall target is not met, the government or companies

covered by the scheme would have to purchase extra carbon allowances from abroad. With sectoral crediting, by contrast, credits would only be issued at the end of a period of trading if emissions were below an agreed baseline.³¹

Promoting “market readiness” is strategically important for the Bank (and its financial backers) in attempting to open up new forms of carbon market in countries which until now have not being obliged to monitor their emissions

Second, sectoral trading cannot be operated on a voluntary basis. Or, rather, the “voluntary” aspect relates solely to whether countries choose to opt-into and create such a scheme in the first place. Once created, the target must be a “defined absolute target” if some scarcity is to be maintained, which is a requirement for the permits to retain their monetary value. In this sense, the scheme forms part of an attempt to overcome the

differentiation between Annex 1 and non-Annex 1 countries within the global climate regime – or what Henry Derwent, President of the International Emissions Trading Association (IETA), has referred to as “a sectoral overcoming of common but differentiated responsibilities.”³²

The question of how sectoral trading allowances would be allocated, or by whom, is left unanswered – although the experience of existing cap and trade schemes shows a consistent pattern of over-allocation (the number of allowances exceeds the “cap”, so no pollution is limited), and has tended to involve free handouts of permits to pollute. Nor is it yet established whether the sectors covered would be defined on a sub-national, national, regional or global basis – although the *Synthesis Report* claims that Parties have expressed a preference for national or bilateral systems.³³

Another variant on sectoral trading would award permits to governments rather than companies. Under this system, the targets need not be met by a domestic emissions trading scheme, but might alternatively be achieved by means of taxation, regulation and/or subsidies.³⁴ However, any resulting surplus would be converted into permits that could be exchanged within other ETS schemes.

The World Bank’s push for new carbon markets

The UNFCCC climate negotiations are not the only means of advancing new carbon market mechanisms. At the UN Climate Change Conference (COP16) in Cancún, the World Bank launched its “Partnership for Market Readiness”, a new carbon fund “aimed at major emerging economies and middle-income countries interested in exploring new carbon market mechanisms, including sectoral crediting mechanism[s].”³⁵ A range of economic activities might eventually be covered by these new markets, with the current (non-exhaustive) list including: power generation, iron and steel, transport, construction/buildings/housing, cement, energy efficiency, waste management, and NAMAs for “low-carbon cities”.³⁶

Promoting “market readiness” is strategically important for the Bank (and its financial backers) in attempting to open up new forms of carbon market in countries which until now have not being obliged to monitor their emissions. This activity pre-empts a political decision within international climate negotiations, despite attempts to dress up the intervention as a merely technical exercise. As the European Commission notes, “Some countries may perceive the [PMR] project as potentially jeopardizing their negotiation positions and the process under the UNFCCC. However, such risk could be mitigated by focusing on the technical discussions and on-the-ground capacity building.”³⁷

This is by no means the first time the Bank has made such a move. At the UN Climate Change Conference in Bali in December 2007 (COP13), the World Bank launched its Forest Carbon Partnership Facility (FCPF), a “market readiness” initiative for Reducing Emissions from Deforestation and Degradation (REDD). As Benoit Bosquet, the Bank official who led the development of the facility, put it at the time, “The facility’s ultimate goal is to jump-start a forest carbon market.” This despite the lack of any UN agreement on REDD carbon markets.³⁸

Moreover, the Bank clearly intends to pursue the creation of new carbon market mechanisms irrespective of UNFCCC negotiations. As the European Commission points out, *“Regardless if the final decision on the establishment of new carbon market mechanisms will be taken under auspices of the UNFCCC or via bilateral or multilateral agreements, the demonstration actions like the PMR will improve understanding on the options for practical implementation of new and scaled-up carbon market mechanisms”* (emphasis added).³⁹

As of June 2011, the Partnership had approved initial grants of \$350,000 to Chile, China, Columbia, Costa Rica, Indonesia, Mexico, Thailand and Turkey.⁴⁰ Each of the eight countries will now develop a “Market Readiness Proposal” to detail their plans. Two further countries, Morocco and Ukraine, have been confirmed as participants. The PMR is ultimately expected to engage between 10 and 15 countries, with six to eight of these engaged in “testing of new carbon market mechanisms such as sectoral crediting, and developing domestic market instruments such as emissions trading schemes.”⁴¹ The initial projects include setting up a carbon offset registry in Mexico, and establishing regional pilot schemes for emissions trading in the power sector in China. The largest share of the money will be allocated to creating systems for Monitoring, Reporting and Verifying (MRV).⁴²

Funding pledges so far come from: Australia, the European Commission, Germany, Japan, Norway, The Netherlands, Spain, Switzerland, the United Kingdom and United States. These amount to a little under \$70 million of the \$100 million expected total.⁴³ The clear majority of this money – most likely all of it – comes from “fast start financing,” the package of climate measures announced as part of the 2009 Copenhagen Accord.⁴⁴

A closer analysis shows that the most significant source of money for the new mechanisms proposed by the Fund will come from the countries that are supposed to be its beneficiaries.

As the European Commission explains, each “beneficiary country” will initially be allocated \$200,000 to identify relevant sectors for the scheme, with an average of \$5 million subsequently spent on “program implementation” in each participating country. \$3million will be dedicated to establishing systems for data collection, monitoring and reporting.⁴⁵ In this regard, the programme closely follows the format adopted in the development of “REDD-readiness” initiatives, such as the World Bank Forest Carbon Partnership Facility.

However, as the European Commission points out, “US\$5 million is not sufficient to bring PMR program to do piloting. The beneficiary countries will be required to allocate human and financial resources to perform all above mentioned tasks.”⁴⁶

The scale of this shortfall can be seen when the PMR figures are compared with estimates that appear in a 2009 study commissioned by the UK Office of Climate Change Global Carbon Trading Project. The comparison is especially noteworthy, because it was conducted by Ecofys, a consultancy which is one of the main advisers to the World Bank and OECD on “market readiness.”⁴⁷

Ecofys estimates that the costs of “capacity building” for sectoral CDM in Chile – which is likely to be a PMR participant – would be over \$14 million dollars (rising to \$25 million if sectoral targets were adopted).⁴⁸ In other words, Chile would contribute two-thirds of the overall costs of developing a scheme from which it is supposed to be a “beneficiary.”

In the case of China, Ecofys estimates that capacity building for “sectoral CDM” would cost \$26 million, rising to \$57 million for the implementation of sectoral targets and \$130 million for a scheme linked to national targets.⁴⁹

Each project is expected to last between three and five years. The initial \$100 million sought to make the Fund operation is also expected to be spent over a timescale of up to five years. However, “The Partnership itself does not have a sunset clause and will continue to provide support as long as there is demand from countries for market readiness capacity building and piloting.”⁵⁰

US\$70 million in “fast start” climate financing has been earmarked for promoting new carbon markets through the World Bank’s Partnership for Market Readiness

Avoided responsibility mechanisms

Various rationales have been offered for “scaling up” carbon markets. The *Synthesis Report*, for example, introduces sectoral carbon markets as “mechanisms to broaden the scope of mitigation.”⁵¹

Proposals for “scaling up” carbon markets in the global South imply a “high-ambition” world in which industrialised countries take bold actions to cut their emissions domestically. As the UN Climate Change Conferences in Copenhagen and Cancún made abundantly clear, this ambition is resolutely lacking

In the context of this debate, it is frequently claimed that the Kyoto Protocol’s flexible mechanisms, most notably the CDM, are unable to achieve the levels of emissions reductions needed to stop runaway climate change.

This is undoubtedly the case, although not necessarily for the reasons put forward by proponents of expanding carbon markets. Richard Baron of the International Energy Agency, for example, points out that the CDM covers less than 1.5 GtCO₂ of electricity production (with claimed “reductions” of 400 Mt - 600 MtCO₂) in “developing” (non-Annex I) countries, out of a total electricity

sector that generates 60 GtCO₂ in the 2000-2012 period that Baron analyses. The sector alone has seen an eight per cent annual increase in CO₂ emissions. On this basis, Baron concludes that the CDM is “structurally unlikely to deliver needed mitigation” and that new mechanisms are therefore needed.⁵²

Fundamental questions of equity are overlooked here. While the rise in emissions in countries of the global South is noted as a potentially alarming trend by the IEA, the historical and present emissions of industrialised countries are not addressed. In detaching emissions trajectories from a broader view of global emissions, the implication is clearly made that climate mitigation actions should be targeted on the global South. This fails to deal with the fundamental *structural* factors contributing to an increase in emissions in Southern countries – which include export-led development models that have seen a significant proportion of emissions rise as a reflection of outsourced emissions from Annex I countries.⁵³

The distribution of responsibility for climate action is directly tied to the context in which new market mechanisms are being proposed. “Scaling up” markets in the global South is conceived as a means to draw non-Annex I countries into engaging in more widespread mitigation actions. Such proposals assume a “high-ambition” world in which industrialised countries take bold actions to cut their emissions domestically. As the UN Climate Change Conferences in Copenhagen and Cancún made abundantly clear, this ambition is resolutely lacking.

The expansion of new sectoral markets in a context of a lack of ambition from Northern countries raises significant questions regarding where the demand for these new credits would come from. The EU and other proponents of new market mechanisms have foreseen this failure to some extent, in their proposal that the “threshold” for carbon credits to be issued by new market mechanisms should be set some way above the level of “reductions” expected to be achieved by the scheme. Under such a scheme, an increased share of the burden of reducing greenhouse gas emissions is placed on Southern countries, in direct contravention to the principle of “common but differentiated responsibilities” that many developing countries hold to be an essential part of the UNFCCC.

Carbon financing: sending the wrong kind of money to the wrong places

New market mechanisms are being proposed with the aim of pushing an increasing proportion of climate financing through the carbon market. Such a conclusion was, for example, reached by the UNFCCC secretariat when looking at the “investment and financial flows” associated with climate change mitigation. In 2007, it estimated that \$90-100 billion per year would need to be invested in developing countries by 2030, whilst the value of the carbon market was estimated at \$10-100 billion.⁵⁴ On this basis, it concluded that the carbon market “would have to be significantly expanded to address needs for additional investment and financial flows.”⁵⁵

Relatively high transaction costs, mixed with significant investment risk, make carbon crediting mechanisms a poor source of new investment

Yet carbon market revenues are far from the only financial flows available to address climate change – and, in fact, tend to provide an extremely poor source of financing. As with other private investments, a significant outflow of funds must also be accounted for in cases where the carbon market finance flows to transnational corporations, or where these companies are owned by private equity funds based in industrialised countries. The increasing reliance on private equity, for example, encourages risky investments that are subject to a far higher failure rate than public finance – a poor basis for the infrastructure investments that climate finance purports to encourage. This tends not to show up in the economic modelling surrounding carbon market financial flows. Such models also exclude the significant pressures that carbon markets bring to bear in terms of resource extraction and land expropriation.

Widening the gap

A further problem with new market mechanisms is that they reinforce and possibly exacerbate distortions in how climate financing is distributed – first, by according a greater proportion of money to mitigation efforts than adaptation and, secondly, by concentrating financial incentives in the hands of large corporations in middle-income countries. As the Centre for European Policy Studies puts it,

*There is a risk that credits would most likely end up with already dominant companies in emerging economies, because of, for example, their size, technical and/or political savvy, access to resources and management and sheer economic weight... This risk is even greater if companies continue to be state-owned or close to the government.*⁵⁶

More importantly, with these new mechanisms targeting major polluting industries and manufacturing for support, local communities would again be the losers – faced with subsidies to significant polluters, often with a long record of disregarding local health and environmental pollution issues.⁵⁷

After the event

There is a strong likelihood that new market mechanisms would mainly subsidise activities that would have happened anyway. In this regard, it reproduces one of the main flaws underpinning the “additionality” claims of the CDM. With credits only issued after the event, and issuance subject to a high degree of risk and uncertainty, projects that could be genuinely only viable with “additional” CDM financing are an unattractive proposition for investors. At a government level, meanwhile, the volatility and uncertainty attached to the scheme could well prove to be a disincentive for many governments.⁵⁸

New investment, by contrast, often needs financing before the implementation of proposals. Relatively high transaction costs, mixed with significant investment risk, make crediting mechanisms a poor source of such money.⁵⁹ Whilst the market does, in theory, offer a means to address this by the “forward-selling” of credits, the cure is in many ways worse than the disease – since it implies gambling on yet-to-be issued credits. This speculative market, which mostly involves trades made “over the counter”, tends to be a source of short-term profit for financial institutions rather than a stable income stream for project building, as well as contributing to the formation of destabilising speculative bubbles.⁶⁰

With 97 per cent of demand for carbon credits primarily driven by its Emissions Trading System, the EU can to a significant extent force through its position on the future of carbon markets irrespective of international climate negotiations

New mechanisms in a contracting market

For now, though, the carbon market looks less like a bubble and more like a busted flush. Even proponents of such markets have noted the dangers of advancing new mechanisms in this context. As Richard Baron et al. of the IEA pointed out in January 2010, “Current estimates show that the supply of credits through scaled-up market mechanisms could be significantly larger than demand... Some observers point to the risk of market flooding, resulting in lower carbon prices and slower mitigation efforts in Annex I countries.”⁶¹ These risks continue to increase.

In the immediate aftermath of the Copenhagen conference (COP15), Bloomberg New Energy Finance, a major carbon market consultancy, estimated that demand for international offsets would reach 4,280MtCO₂ over the eight year period from 2012-2019, equivalent to an average of 530MtCO₂ per year.⁶² By way of comparison, Bloomberg estimated the supply of international offsets from existing CDM and JI schemes ranges from 2480Mt (310Mt/ yr) to 4460Mt (560 Mt/yr).

Fast forward 18 months, and the estimated demand for carbon credits has fallen even further. The World Bank’s *State and Trends of the Carbon Market 2011*, released on 1 June, estimates a demand of between 2.92 billion and 3.91 billion tonnes of offset credits for the 2013 to 2020 period.⁶³ This range includes 1.75 billion estimated demand from within the EU if it sticks with its current 20 per cent emissions reduction target (compared to 1990 levels), or 2.55 billion if the EU adjusts its target to 30 per cent.⁶⁴ The World Bank optimistically speculates that Australia will start purchasing carbon credits in 2015; that none of the large surplus of “hot air” Assigned Amount Units (AAUs, a unit of emissions reductions issued under the Kyoto Protocol) will be rolled over for use by governments attempting to meet emissions reduction targets in the post-2012 period. Its figures, moreover, reflect a “maximum theoretical demand.”⁶⁵

By comparison, the World Bank estimates that 2.5 billion offsets will be generated, with 50 to 70 per cent of these coming from CDM projects registered before 2012.⁶⁶ The reduction in the projected supply of credits factors in the impact of new restrictions imposed by the EU in the third phase of its ETS, which begins in 2013. The EU ETS will restrict the use of CDM credits to those issued by projects registered pre-2013, with the exception of projects undertaken in Least Developed Countries (LDCs). It will also disallow the use of credits from HFC and N₂O industrial gas projects, which account for 67 per cent of the total issued to date.⁶⁷ This reflects the stated strategy of the EU for the future of the global carbon market: restricting the CDM to LDCs, and developing new market mechanisms in its place to draw middle-income countries into cap and trade schemes related to binding emissions targets. With 97 per cent of demand for carbon credits primarily driven by its ETS, the EU can to a significant extent force through its position on the future of carbon markets by means of domestic rule changes, irrespective of international climate negotiations.⁶⁸

Comparing these supply and demand projections shows that, even with the EU's rule changes factored in, the World Bank's "optimistic" estimate still leaves just 400 million to 1.4 billion tCO₂e of demand that is unmet by the existing CDM in the 2013 and 2020 period – at the low end, just 50 MtCO₂e per year. By way of comparison, the emissions from the largest single power plant within the EU ETS are currently almost 90 MtCO₂e per year.⁶⁹

The World Bank does not follow through on its exercise to estimate the potential supply of credits from new sectoral market mechanisms. The submissions to the UNFCCC consultation, and the *Synthesis Report*, are similarly silent on the supply-side question. An IEA/OECD study gives an overview of projections as to the potential scale, however.⁷⁰ It estimates that sectoral crediting in the power sector could amount to 465 MtCO₂e annually, or 3.7 Gt CO₂e from 2013-2020. Other studies cited by the OECD project a potential supply of 110-560 MtCO₂e annually if the scheme for a multi-country power sector scheme; 154-767 MtCO₂e annually if it were to cover only the power sector in China; an additional 450 MtCO₂e annually if the cement sector were to fall under a "no lose" target sectoral crediting scheme, and 1GtCO₂e if the steel sector were to do likewise.

Serious questions therefore need to be raised about the potential demand for the credits generated by new market mechanisms. Without additional restrictions on the use of carbon credits, it is likely that the creation of new market mechanisms would create a surplus of credits that could collapse the price of carbon – undermining the purported rationale of the scheme.

Climate financing: a disappearing act

There are many good reasons why a further collapse in the carbon market would not be mourned by observers interested in addressing climate change equitably and justly. It is, however, worth noting that the creation of new market mechanisms risks a contagion that would spread beyond carbon trading to climate finance more generally.

To more fully appreciate this, the new market mechanisms should be seen in the context of a far broader shift from public to private climate finance. Industrialised countries in the North have disproportionately contributed to causing climate change, and therefore face obligations to tackle it – which is often referred to in the UNFCCC debate under the rubric of "common but differentiated responsibilities"; and discussed under the rubric of "climate debt" by many climate justice activists. In so far as this implies financial transfers, this had typically been conceived of as involving public money.

Many industrialised countries now face significant debt burdens as a result of bailing out their failing financial sectors, with the IMF estimating an increase in industrialised country debt-to-GDP ratios of 110 per cent by 2015.⁷¹ In the face of such projections, these countries are failing to take responsibility for the climate problem, and are searching instead for "innovative" sources of financing, with particular emphasis on the private sector.

Counting carbon market revenues as "climate financing" conveniently bridges the funding gap on paper, but does so by removing the element of obligation. Private money is assumed to take the place of public investment, yet this is likely to result in a bias towards projects with a high risk of failure, and premised on a high rate of return for (Northern-based) investors – the full costs of which are excluded from the balance sheet considering these new forms of financing.⁷² The "readiness" mechanisms to receive such financing tend to involve an economic liberalisation that has a destabilising effect on economies.

This represents a financialisation of climate change mitigation – yet, ironically, it was the consequences of an overly financialised economic model that have resulted in the public debt crisis faced by industrialised countries in the first place.

These measures also introduce a significant risk that the projected carbon market revenues that are being put at the heart of climate finance will fail to materialise. The UN Secretary General's High Level Advisory Group on Climate Change Financing (AGF) suggested that \$30 to \$50 billion per year in climate financing could be achieved from additional carbon market financial flows by 2020.⁷³ However, if the estimates are re-run using the demand estimates and carbon prices from the World Bank's *State and Trends of the Carbon Market* the figure is very different: financial flows related to carbon offsets could amount to just \$3.99 billion per year.⁷⁴

On top of the issues of environmental integrity and social justice that invariably accompany the carbon market; the need to compare such figures to the flow of resources and finance from South to North; the increased risk that carbon finance entails; and the element of “double counting” involved in treating carbon credits as mitigation and finance; and the lack of ambition shown by the AGF (and Green Climate Fund's) \$100 billion per year figure, this suggests that a central emphasis on market mechanisms in the provision of climate finance could create a large hole in the figures, with the money failing to turn up.

An alternative scenario is that a significant gap between baselines and “reference levels” is introduced – in effect, displacing the burden of action onto Southern countries.

Conclusion: saying no to new carbon markets

New sectoral carbon markets are presented as a means to “move beyond” the CDM and “scale up” mitigation actions in the global South. However, increasing the size of carbon markets is not the same as reducing emissions. The evidence of the CDM to date suggests that offsetting increases rather than reduces greenhouse gas emissions. New sectoral mechanisms risk “scaling up” these failings.

The introduction of new markets in the context of a declining global trade carbon throws this into sharp focus. If new mechanisms start delivering significant quantities of credits in a market with limited demand for them, the price of carbon would likely collapse. Introducing new markets in a context of unambitious climate action by industrialised (Annex I) countries is likely to undermine both climate change mitigation efforts and flows of climate financial.

These new mechanisms may well help industrialised country governments and corporations to delay meaningful domestic action to reduce their greenhouse gas emissions, however, as well as shifting environmental and fiscal responsibility for tackling climate change towards middle-income countries in particular, and Southern countries more generally. An alternative explanation of the push for new market mechanisms is that they address corporate competitiveness concerns of industrialised countries, rather than concerns over environmental or social integrity.

It has not been the aim of this report to fully articulate an alternative framework, although a plethora of other measures exist.⁷⁵ The intention, rather, has been to intervene in a debate on new market mechanisms, in the hope of clearly showing that sectoral carbon markets are a poor choice when it comes to mitigating climate change, both in terms of the actions they promote and their cost effectiveness. It should not be forgotten that the question of how to address climate change in a just and equitable way is far broader.

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Many industrialised countries now face significant debt burdens as a result of bailing out their failing financial sectors. In the face of this, they are shirking their responsibility for the climate problem and searching instead for “innovative” private sector financing. These would hands greater control of climate mitigation to the financial actors who caused the debt crisis in the first place

Notes

1. I would like to gratefully acknowledge the support of the Isvara Foundation, which made possible the writing of this report.
2. Pete Harrison (2011) "EU energy plan threatens carbon billions", *Reuters*, 30 May, <http://uk.reuters.com/article/2011/05/30/eu-energy-climate-idUKTRE74T23C20110530>
3. World Bank (2011) *State and Trends of the Carbon Market 2011* Washington: World Bank Group
4. The terms "North" and "South" here are used to draw a geopolitical distinction rather than a strictly geographical one. The division broadly corresponds to the Annex I / non-Annex I distinction in UNFCCC climate negotiations.
5. See Tamra Gilbertson and Oscar Reyes (2009) *Carbon Trading: how it works and why it fails* Uppsala: Dag Hammarskjöld Foundation, <http://www.carbontradewatch.org/publications/carbon-trading-how-it-works-and-why-it-fails.html>, chapter 4.
6. UNFCCC (2007) Bali Action Plan, http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf
7. This focus is far from complete, therefore, in terms of coverage of new carbon market initiatives. In particular, further research is needed on the "linking" of carbon markets, including connections between domestic cap and trade schemes, as these are starting to emerge. New bilateral initiatives are also emerging strongly, and with the fairly naked aim of export-promotion. For example, Japan has recently established a \$1.6 billion fund which will treat technology sales – including the export of nuclear technology and investments related to Carbon Capture and Storage (CCS) – as offsets. See <http://www.businessgreen.com/bg/news/1935223/report-japan-promises-usd16bn-clean-tech-exports-investment>
8. UNFCCC (2011a) "Synthesis report on information on various approaches in enhancing the cost-effectiveness of, and promoting, mitigation actions: note by the secretariat", 30 March, FCCC/AWGLCA/2011/4, p.4
9. UNFCCC (2011a)
10. UNFCCC (2011a)
11. Richard Baron (2010) "Proposals for Sectoral Crediting, Sectoral Trading and National Appropriate Mitigations Actions in International Negotiations", EPRI Greenhouse Gas Emissions Offset Policy Dialogue Workshop 7 – Sectoral and International Crediting Mechanisms, Washington DC, 25 February, http://www.iea.org/speech/2010/baron_washington.pdf, slide 7, lists the following sectors: Power generation, Heavy industry (cement, steel, aluminium?), Forestry. See also CCAP, "Greenhouse Gas Mitigation in Brazil, China and India: Scenarios and Opportunities through 2025: Conclusions and Recommendations," Center for Clean Air Policy (CCAP), Washington, D.C., November, 2006. This report lists what it claims are the most cost-effective emissions reductions in Brazil, China and India as coming from electricity, cement, transport, paper and steel industries. Lars Zetterberg (2009) "EU proposals on sector crediting – towards a global carbon price?", Swedish Environment Institute, 4 June, http://unfccc2.meta-fusion.com/kongresse/090601_SB30_Bonn/download/090604_Mistra_Zetterberg.pdf finds that studies commissioned by Swedish, British and German government agencies indicate the following sectors: Iron and steel; Cement and Lime; Refined petroleum; Fertilizers; Pulp- and paper; Aluminium. Ward, Murray, Charlotte Streck, Harald Winkler, Martina Jung, Hagemann, Niklas Höhne and O'Sullivan (2008) "The Role of Sector No-Lose Targets in Scaling Up Finance for Climate Change Mitigation Activities in Developing Countries", Ecofys et al., p.18 suggests Electricity generation; cement, aluminium or steel production (noting that "other similar type industrial commodities may also be feasible, e.g. bricks, pulp and paper, some chemicals including refined oil products, some mining and mineral processing etc."); 'upstream' emissions of oil and gas production (e.g. gas venting and flaring). Jake Schmidt, Ned Helme, Jin Lee, Mark Houdashelt (2008) "Sector-based approach to the post-2012 climate change policy architecture" *Climate Policy* 8, p.498 suggests that: "The electricity and major energy-intensive industry sectors – electricity, iron and steel, aluminium, oil refining, cement, lime, and pulp and paper – are well suited to the 'no-lose' sectoral GHG intensity targets"
12. Hungary and the European Commission on behalf of the European Union and its Member States (2011) "New market-based mechanisms to enhance the cost-effectiveness of, and to promote, mitigation actions" in UNFCCC (2011b) *Market-based and non-market-based mechanisms: Views on the elaboration of market-based mechanisms. Submissions from Parties*, FCCC/AWGLCA/2011/MISC.2, 21 March, paragraph 29, p.52; AOSIS, *Ibid.*, p.45
13. e.g. Mark Lazarowicz (2009), p.66: "The Eliasch Review, commissioned by the UK Prime Minister, recommended a period of capacity building followed by government-level Sectoral Crediting over the medium term for reducing emissions from deforestation and degradation (REDD) in developing countries, in conjunction with public funds and other forms of private finance." It should also be noted that paragraph 1.b. (iv) of the Bali Action Plan, which refers to "sectoral approaches", remains focused on technology transfer, although discussions of aviation, shipping and agriculture (some of which are linked to carbon markets) have been introduced under this agenda item this can mean a range of other initiatives, not linked to carbon markets. For a fuller summary on non-carbon market based sectoral approaches, such as best practice standards, see UNEP (2009) *Industry Sectoral Approaches and Climate Action*
14. UNFCCC (2011b), p.45; Business Europe (2011), "Market Mechanisms in a Post-2012 UNFCCC Agreement", 21 February, p.3; FAO (2011), "A submission to UNFCCC Secretariat on NAMAs in answer to the invitation of article 82 of Decision FCCC/AWGLCA/2010/L.7"
15. The Kyoto Protocol assigned responsibility for reducing international aviation and shipping emissions to the ICAO and IMO. A number of countries and blocs have expressed frustration at the inability of these institutions to reach agreements on climate change. The EU has legislated for the inclusion of aviation in its ETS starting from January 2012, and is considering including shipping that docks in the EU in the scheme too. The issue of international transport emissions will be re-discuss at UNFCCC discussions at Bonn in June 2011, see http://unfccc.int/methods_and_science/emissions_from_intl_transport/items/1057.php
16. Hungary et al. (2011), p.54
17. Lazarowicz (2009), p. 61
18. The idea of "No lose targets" was initially proposed by the Centre for Clean Air Policy. See J Schmidt and N Helme (2005) "Operational Issues for a Sector-Based Approach: Questions and Answers", Center for Clean Air Policy, October
19. Wolfgang Sterk (2010) "New Mechanisms for the Carbon Market? Sectoral Crediting, Sectoral Trading, and Crediting Nationally Appropriate Mitigation Actions" JIKO Policy Paper 4/2010, June, p.4; Richard Baron, IEA/OECD, "Sectoral Approaches to GHG Mitigation: Scenarios for Integration" October 2006, p.10
20. Richard Baron, John Newman, André Aasrud, Barbara Buchner, Keisuke Inoue and Sara Moarif (2009) *Sectoral Approaches in Electricity: building bridges to a safe climate*, IEA/OECD, p.16. Ward et al. (2008), p.7 also warns of the danger that new market mechanisms may "flood" the market without checks on the supply side.
21. Richard Baron et al. (2009), p.16
22. UNFCCC (2011b), p.9
23. Third World Network (2009) "Understanding the European Commission's Climate Communication" Penang: Third World Network
24. Hungary and the European Commission (2011), paragraph 45, in UNFCCC (2011b), p.56
25. Baron (2006), p.10
26. Sterk (2010), p.4
27. Sterk (2010), p.6
28. This proposal shares some features with "Sustainable Development Policies and Measures" (SD-PAMS), another approach that has been suggested as a means to flesh out the meaning of NAMAs. The main difference, at present, is that typically SD-PAMS imply non-carbon market sources of funding, and would not therefore generate carbon offset credits. Instead, SD-PAMS would be funded by either public or private financing from Northern countries, or by international measures such as a tax on international aviation and shipping, or a Tobin Tax (on currency speculation)
29. Lazarowicz (2009), p.62
30. For more on the HFC controversy, see <http://www.delicious.com/carbontradewatch/HFC> The EU ETS, which is by far the largest source of demand for offset credits, will phase

- out the use of CERs from HFC (and N2O adipic acid plants) by April 2013.
31. Lazarowicz (2009), p.57
 32. Remarks at World Business Summit on Climate Change, Copenhagen, May 2009
 33. UNFCCC (2011a), p.7
 34. Lazarowicz (2009), p.71
 35. European Commission (2010) "2010 Annual Action Programme (Part II) Implementing the Thematic Programme for the Environment and the Sustainable Management of Natural Resources including Energy (ENRTP)", http://ec.europa.eu/europeaid/documents/aap/2010/af_aap_2010_dci-env_p2.pdf, p.19.
 36. World Bank Climate Finance Unit (2011), "Partnership for Market Readiness (PMR): Update and preliminary insights", March, <http://www.oecd.org/dataoecd/55/19/47517775.pdf>
 37. European Commission (2010), p.23
 38. André Aasrud, Richard Baron and Katia Karousakis (2010) "Market Readiness: Building blocks for market approaches" Presentation from Climate Change Expert Group on the UNFCCC, Cancun, 7 December, http://www.iea.org/work/2010/cop16/IEA_Day_Aasrud&Baron.pdf, p.7. The authors note a "Lack of progress in the negotiations" on new market mechanisms, but that "pilot activities may be a useful first step," citing the COP13 decision at Bali to initiate "REDD demonstration activities" through the FCPF. The Climate Change Expert Group is a long-standing IEA/OECD initiative working on behalf of Annex I countries, which was instrumental in the elaboration of emissions trading proposals within the Kyoto Protocol.
 39. European Commission (2010), p.23
 40. World Bank Climate Finance Unit (2011) "Partnership Approves Grants for Eight Carbon Market Initiatives", June, <http://go.worldbank.org/UOGJZTB2Z0>
 41. European Commission (2010), p.21
 42. European Commission (2010), p.25. A similar conclusion is reached by the consultancy Ecofys, cited André Aasrud et al. *Market Readiness: Building Blocks for Market Approaches*. OECD, p.41: "Putting in place adequate MRV represent the largest share of these costs [of market mechanism capacity building], followed by costs associated with putting in place policies and legal reform."
 43. World Bank Climate Finance Unit (2011) "Partnership Approves Grants for Eight Carbon Market Initiatives", June, <http://go.worldbank.org/UOGJZTB2Z0>
 44. See Australian Government, "Australia's Fast Start Finance: Progress Report" <http://www.climatechange.gov.au/en/media/whats-new/~media/publications/international/australias-fast-start-finance-progress-report.ashx>.p.10; The European Commission, op. cit. p. 18 also identifies its pledge as fast start financing, and notes that pledges from Norway, Sweden, Australia, Japan, Spain, and Netherlands would come from fast start funding. See also http://faststartfinanceint.accounts.combell.net/contributing_country/european-union
 45. See European Commission, (2010), p.23:
- The full breakdown is: Data collection and management system and baseline study and set up: \$1.5million; MRV: \$1.5million; Institutional strengthening, including setting up domestic unit for coordination and implementation: \$0.5million; Regulatory system preparation: \$0.7million; Stakeholder consultation: \$0.3million; Operational cost for PMR support: \$0.5 million
46. European Commission (2010), p.26
 47. For a listing of recent Ecofys consultancy projects in support of market mechanisms, see Ecofys, "Supporting the international climate negotiations: A record of projects, December 2010", http://www.ecofys.com/com/publications/documents/Folder_Ecofys_References_Climate_Negotiations_12_2010.pdf p.9
 48. Marion Vieweg et al. (2009) "Linking Developing Countries to Carbon Markets: cost assessment of capacity building requirements", London: Ecofys UK. The figures quoted for Chile are a like-for-like comparison with the capacity building estimates given by the PMR – both assume sectoral crediting, and exclude implementation costs.
 49. The comparison here is more complex: China has announced an intention to pilot schemes at a regional level, but the Ecofys study does not clearly state whether it assumed the costs of regional piloting or a full-blown national programme.
 50. European Commission (2010), p.26
 51. UNFCCC (2011a), p.7
 52. Richard Baron (2010) "Proposals for Sectoral Crediting, Sectoral Trading and National Appropriate Mitigations Actions in International Negotiations", EPRI Greenhouse Gas Emissions Offset Policy Dialogue Workshop 7 – Sectoral and International Crediting Mechanisms, Washington DC, 25 February, http://www.iea.org/speech/2010/baron_washington.pdf
 53. Peters, Glen, J. Minx, C.L. Weber and O. Edenhofer (2011) "Growth in emission transfers via international trade from 1990 to 2008" *Proceedings of the National Academy of Sciences*, 108 (21): pp. 8903-8908.
 54. UNFCCC (2007) *Investment and Financial Flows to Address Climate Change* Bonn: UNFCCC
 55. UNFCCC (2007) para 6. See Ward et al, p. 52. In fact, the UNFCCC figures do not compare like with like
 56. Centre for European Policy Studies and World Business Council for Sustainable Development (2008), *Global Sectoral Industry Approaches to Climate Change*, Brussels: CEPS and WBCSD, p.34
 57. See Gilbertson and Reyes (2009), chapter 4
 58. Ward et al. (2008), p.71
 59. Sterk (2010), p.7
 60. Jutta Kill et al. (2010), *Trading Carbon: how it works and why it is controversial* Moreton in Marsh: FERN, chapter 5
 61. André Aasrud, Richard Baron, Barbara Buchner and Jane Ellis "Scaled-up Market Mechanisms – What is Needed to Move Forward?" in Arielle Kramer (ed.) (2010)
- Greenhouse Gas Market Report 2010 . Post Copenhagen and Climate Policy: Where Global Emissions Trading Goes from Here* , Geneva: IETA, p.118
62. Guy Turner "Copenhagen and the Implications for Supply and Demand Dynamics in the Global Carbon Market " in Arielle Kramer (ed.) (2010), p.96
 63. World Bank (2011), *State and Trends of the Carbon Market 2011* Washington: World Bank Group, p.66, p.63. This figure is in addition to a 1,280 MtCO₂e surplus of permits and credits that will be held over from phase 2 to 3 of the EU ETS.
 64. World Bank (2011), p.66
 65. World Bank (2011), p.66
 66. World Bank (2011), p.67.
 67. World Bank (2011), p.48
 68. World Bank (2011), p.9
 69. ELEKTROWNIA BEŁCHATÓW in Poland had verified emissions of 89,995,454 in 2010, according to the EU, see <http://ec.europa.eu/environment/ets>
 70. Richard Baron, Barbara Buchner and Jane Ellis (2009) *Sectoral Approaches and the Carbon Market* Paris: IEA/OECD
 71. International Monetary Fund (2010), "Navigating the Fiscal Challenges Ahead", Washington DC: IMF
 72. A similar public to private shift has been observed in the field of development finance. See Bretton Woods Project (2010), "The private sector turn", 17 December, <http://www.brettonwoodsproject.org/art-567281> and Eurodad and CRBM (2011), *The private turn in development finance: effective for development? Background papers*, 18-20 May
 73. (2010) *Report of the Secretary-General's High-level Advisory Group on Climate Change Financing*, New York: United Nations, 5 November, p.17
 74. The basis for the AGF estimates is explained in a background paper to the report, "Work Stream 8, Carbon Markets: Benefits to developing countries and options for expansion." The AGF estimates are based on the value of the trade in primary credits, eg. 400 Mt of credits issued 2005-9 at average 14.6 euro/tonne. However, this does not factor in price differentials between primary and secondary CERs (the former are cheaper due to issuance uncertainty. It also puts a price estimate that is way in excess of the actual price of post-2012 CERs. These are currently trading at between 6 and 8 euro/tonne (\$7.97 to \$10.62 bn, if using the \$1.328 exchange rate that the World Bank report uses). This price compares unfavourable to the "low price scenario" of \$10-15 per tonne used by the AGF. The \$3.99 billion figure is calculated on the basis of a carbon price of \$7.97, and a demand for 500 MtCO₂e of offsets (and/or sectoral credits) per year by 2020.
 75. See Gilbertson and Reyes (2009), chapter 5; and Sarah-Jane Clifton, (2010) *Clearing the Air: moving on from carbon trading to real climate solutions*, November, London: Friends of the Earth EWNI, http://www.foe.co.uk/resource/reports/clearing_air.pdf