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# Catalysing Private and Public Action for Climate Change Mitigation: The World Bank's Role in International Carbon Markets

Axel Michaelowa<sup>1,2</sup>, Katharina Michaelowa<sup>2</sup>, Igor Shishlov<sup>1</sup>, Dario Brescia<sup>1</sup>

<sup>1</sup>Perspectives Climate Research, Hugstetter Strasse 7, 79106 Freiburg, Germany, michaelowa@perspectives.cc, shishlov@perspectives.cc, brescia@perspectives.cc

<sup>2</sup>University of Zurich, Affolternstrasse 56, 8050 Zurich, Switzerland, axel.michaelowa@pw.uzh.ch, katja.michaelowa@pw.uzh.ch

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## Abstract

This policy analysis examines the role of the World Bank in shaping and stimulating international carbon markets. Adopting a public choice perspective, we argue that its engagement can be understood as a response to the joint goal of reputational and financial benefits. The detailed empirical account of the Bank's activities – from its pioneering role through the Prototype Carbon Fund in the early 2000s, to its initiatives for upscaled crediting subsequent to the 2015 Paris Agreement – is broadly in line with this interpretation. The period between 2005 and 2011 most clearly shows that the Bank was ready to forego some reputational benefits for the sake of financial benefits. During this period, it followed a flourishing privately driven carbon market, mostly competing with, rather than catalysing, private activities. After the Paris Agreement opened the door for a new phase of carbon markets, the Bank again took up a pioneering role, now focusing on the public sector. However, since transparency in relation to its activities is limited – thus reducing reputational risk – these activities may not meet the quality standards, notably with respect to additionality, that are a precondition for carbon markets to be an effective tool for climate change mitigation.

## Key policy insights

- Over time, the World Bank has alternated between being an “agenda setter”, catalysing private and public sector engagement in carbon markets, and a “regime follower” regarding international carbon markets, based on varying reputational and financial benefits.
- In the post-Paris climate regime, the Bank has resumed its original pioneering role, although the scale of its activities is smaller, and they are less transparent, than during the Kyoto Protocol period of the early 2000s.
- To maximize its contribution, the Bank can act as a source of initial demand for carbon credits, but must have an exit strategy in place once the private and public sector gets sufficiently involved.
- Sufficient transparency on the Bank's activities is required; reputational considerations provide an incentive to support generation of high-quality carbon credits.

**Keywords**

International carbon markets, carbon credits, World Bank, Paris Agreement, Kyoto Protocol

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## 1. Introduction

In order to achieve the objective of the Paris Agreement to limit global warming to 2°C or even 1.5°C, mitigation efforts by public and private actors need to be combined (UNEP, 2018). Relevant incentives for private actors to participate in mitigation can be generated through the setup of carbon markets; these can also help governments to reduce the costs of reaching given emissions targets. As opposed to markets for most commodities, the functioning of carbon markets critically depends on political will and public regulation through bodies like the Executive Board of the Clean Development Mechanism (CDM) under the Kyoto Protocol and its support staff from the Secretariat of the UN Framework Convention on Climate Change (UNFCCC).<sup>1</sup>

While different public entities and organizations may collaborate, some typically take over the lead as “agenda setters” and drivers of the relevant processes. In order to be successful, agenda setters try to catalyze action of other entities to further their agenda. This will be particularly effective if the entities whose action is catalyzed include private sector players. During the development of international carbon markets, the World Bank partially assumed this role. In this paper, we examine when and how this happened and what could have been the determinants of its engagement in this role.

We first suggest a number of conditions that could drive the Bank’s engagement to catalyze private actor activities. We argue that the Bank strives for both reputational and financial benefits, and chooses its activities accordingly. With this in mind, we explore the development of international carbon markets over time and assess whether the Bank’s actual role corresponds to expectations.

## 2. Conditions shaping World Bank engagement in carbon markets

There is a large set of national, international, governmental and non-governmental actors constituting what political scientists have labelled the “climate change regime complex” (Keohane and Victor, 2011). Our analysis of the Bank as one of the central players in this setting is based on a public choice approach, in the tradition of works such as Vaubel and Willet (1991). This is based on a rich literature on how not only powerful member states, but also bureaucratic interests and other stakeholder interests, shape the activities and funding allocation of international organizations<sup>2</sup>. Building on prior work on the activities of the Bank in the area of carbon markets and the related creation of specific trust funds (Michaelowa and Michaelowa, 2011, Reinsberg et al., 2017, Reinsberg, 2017), we consider both the interests of the Bank as a whole as defined by its shareholders, and the interests of individual operative units within the organization. Within individual trust funds the interests of contributing donors eventually constrain the Bank’s freedom of action, but Bank staff are free to negotiate an appropriate agreement ex ante.

We consider that Bank activities – including the setup of trust funds with appropriate rules – are driven by substantive (regarding its statutory aim of promoting development),

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<sup>1</sup> This is particularly difficult if resources are scarce. For a discussion on the resources available for managing the CDM at the UNFCCC Secretariat, see Michaelowa and Michaelowa (2017).

<sup>2</sup> For recent works, see e.g. Kersting and Kilby (forthcoming), Dreher et al. (2019), Michaelowa et al. (2018), and more directly related to our context: Flues et al. (2010), and Michaelowa and Michaelowa (2017).

reputational and financial benefits. Assuming that reputational benefits are derived from success in areas considered as relevant to the statutory aim of the Bank, the first two objectives become indistinguishable, and we can simplify the discussion by just speaking about reputational and financial benefits.

Combating climate change falls into the key areas of Bank activity since climate change impacts are closely related to worsening development prospects for poor countries. Successful activities in this area hence generate reputational benefits, and even more so when these activities are able to demonstrate the Bank's economic skills and innovative capacity. In contrast, reputational risks could arise if the Bank appears as a "greenwasher" due to promoting a lenient interpretation of environmental integrity. Reputational costs could also arise if the Bank moves from supporting to competing with other actors, notably the private sector or the UN climate change regime centred around the UNFCCC and the other climate change treaties. Indeed, the Bank has, at times, been heavily criticized for its attempted domination of carbon markets (e.g. Cabello 2009).

While these reputational concerns should be similar for the different actors within the Bank, financial benefits arise primarily to the responsible operational unit. These financial benefits accrue through fees for the management of carbon trust funds, and through the targeted resources that bilateral donors eventually provide to these funds. Along with an increase in the budget that the administrative unit is responsible for, these resources also increase the unit's autonomy within the organization, and provide an opportunity for staff expansion (Michaelowa and Michaelowa, 2011). This may lead administrative units to accept trust funds with high transaction costs for the Bank as a whole (such as single donor trust funds) or without appropriate regulation for their phase out, once they have fulfilled their initial objective (e.g. funding particular projects).

A major trade-off between financial and reputational benefits can arise once markets function well. In this situation, the Bank's engagement becomes financially very attractive (for the Bank itself as well as for donors participating in the relevant trust funds). Rather than crowding in private resources, the Bank then has an incentive to crowd out those private activities (Michaelowa and Michaelowa, 2011). Once private actors become aware of this competition, this may lead to complaints, with related reputational costs. However, this effect may take some time, and/or not be strong enough to outweigh the financial incentive.

### 3. Tracking the World Bank's activities over time

We can roughly distinguish four phases in the development of international carbon markets: a starting phase until the mid-2000s, a boom from 2005 to 2011, a downturn between 2012 and 2015, and a slow restart in a different institutional setting following the adoption of the Paris Agreement (Michaelowa et al., 2019b).

Based on a literature review and a quantitative assessment of baseline methodologies, project-related data, and information on the Bank's climate trust funds, we distinguish between activities that have the character of "agenda setting", i.e. influencing the design of international market mechanisms and trying to catalyse private sector and government action, and those where the Bank engages in established structures in order to generate revenues ("regime follower").

### 3.1. International carbon markets under the UN climate change regime

Under the 1997 Kyoto Protocol, international market mechanisms have included Joint Implementation (JI) for the exchange of credits between industrialized countries, and the CDM for the exchange of credits generated for emission reductions in developing countries. Both mechanisms have used baseline and crediting systems, i.e. emission reductions that were additional to a projected baseline (calculated according to a methodology adopted by the relevant body of the UNFCCC) could be credited and sold. New market mechanisms are currently being developed under Article 6 of the Paris Agreement (Paris Mechanisms) but it has proven difficult to agree on common rules – decisions have been deferred by two consecutive Conferences of the Parties (COP) in 2018 and 2019.

### 3.2. The World Bank during the emergence of carbon markets, 1997-2005

The generic concept of international carbon markets emerged during the 1990s. After a conflict between some industrialized countries interpreting a provision in the UNFCCC as allowing transactions of emission credits and developing countries opposing this interpretation, the COP 1 to the UNFCCC in 1995 agreed on a pilot phase for international collaboration on emission reduction projects called “Activities Implemented Jointly” (AIJ). While AIJ could not generate any emission credits, it laid the groundwork for assessment of project-based emission reductions. The improved understanding due to AIJ reduced government mistrust regarding market mechanisms and led to their inclusion in the Kyoto Protocol (1997). In this period, the Bank prepared its first environmental strategy (Mucklow, 2000), which included the achievement of greenhouse gas (GHG) emission reductions (Shih, 2000). In 2000, the Bank launched the Prototype Carbon Fund (PCF). The purpose of this and subsequent carbon funds was to pioneer and demonstrate that carbon markets could support the global public good of mitigation.

The Bank’s carbon market strategy published in 2003 comprised the following three main goals: (a) expand support for carbon market development and increase the viability of project-based mechanisms, (b) extend the benefits of carbon markets to the smallest, poorest countries and poor communities, and (c) demonstrate carbon markets for carbon sinks (sequestration) (IEG 2018). The PCF remained the Bank’s most important instrument to achieve these goals and set an example of innovative partnership and public-private cooperation (Streck, 2004, Smyth, 2005), mobilizing both private and public resources for purchasing emission reduction credits. Given its governance arrangements and enhancement of structures of voting and participation (including public and private actors), the PCF has many elements of legitimate decision making. The PCF’s decisions are taken by a Participants’ Meeting with votes proportional to monetary contributions, putting private sector players on an equal footing with governments. A two-thirds majority is required to decide on criteria for project selection, meaning that minority actors cannot be overruled in a simple manner. The PCF pioneered mechanisms for the allocation of emission reduction credits to the fund participants through development of Emissions Reduction Purchase Agreements (ERPAs) under Anglo-Saxon law (Matz, 2005). Transparency of PCF activities was exemplary with detailed annual reports and project information shared on the internet.

One of the goals of the PCF was to test new approaches to support developing countries to effectively participate in the emerging carbon market and generate knowhow on transactions in a “learning-by-doing” fashion, especially through legal and institutional capacity building (Kiss et al., 2002). Zhang (2006b) affirms that, at least in the Chinese context, the PCF itself contributed to effective capacity building.

The PCF demonstrated that developing countries tend to offer lower cost opportunities for emission reductions than OECD countries. It provided concrete examples of management of carbon transactions that paved the way for other funds to enter the market, for example, agreements with the private steel company Plantar SA to replace the use of coal with charcoal in Brazil (de Gouvello et al., 2018, Reis, 2003). In the context of the Plantar project, innovative financial structures were developed – the revenue from carbon credits was used as security for loans from a private bank. The PCF was able to purchase high quality credits and at the same time support and leverage mobilization of additional finance into mitigation projects (Lecocq, 2003).

As clearly shown by de Gouvello et al. (2018), PCF projects had the aim of convincing reluctant host country governments that CDM and JI were able to generate relevant revenues through the sale of credits. This was achieved, as large countries like China and India that had previously been sceptical of the CDM proactively engaged after having seen that PCF transactions actually worked. Already in late 2003, 16 countries were involved in “advanced stage” CDM projects, and seven in JI projects (Prototype Carbon Fund, 2003).

Based on these achievements, some authors acclaim the PCF not only as innovative, but as truly path breaking (Zhang, 2006a). However, the PCF was not unequivocally welcomed. Eight environmental NGOs, for example, officially requested the Bank to shut down the PCF due to negative impacts on biodiversity, human rights and living conditions (Environmental News Service, 2004). Yet, this remained a one-time criticism, primarily related to the Plantar project in Brazil described above.

Following the establishment of the PCF, the Bank soon opened two additional trust funds, namely the Community Development Carbon Fund (CDCF) in 2003 and the Biocarbon Fund in 2004. These funds aimed at exploiting synergies between mitigation and other topics related to sustainable development, such as biodiversity, arresting land degradation, and local community development in low-income countries (Kiss et al., 2002). The Biocarbon Fund had the objective of supporting low-income countries to participate in carbon markets and more specifically the rural communities in these countries to benefit from carbon credits sales generated by forestry and agricultural projects. Similar to the PCF, it also had private funders. The CDCF focused on CDM activities in low-income countries for poor/vulnerable communities that otherwise would not be able to attract carbon market investments (Carbon Finance Unit, 2005).

The Bank also engaged in capacity building activities beyond those that came along with the projects of its piloting funds. In 1997, jointly with Switzerland, it started the National Strategy Studies (NSS) Program that provided capacity building for participation in carbon markets. Initially targeted only at countries with economies in transition, the programme was expanded to developing countries once the Kyoto Protocol defined the CDM. Australia, Austria, Canada, Finland and Germany subsequently joined. Up to 2004, detailed studies were developed for over 20 countries, most of which later strongly benefited from the Kyoto mechanisms (Michaelowa, 2005). The studies assessed GHG emission reduction potential and

costs and CDM/JI options, and developed a project pipeline. The programme brought together host country stakeholders with international experts in biennial program workshops. It also actively shared lessons with UNFCCC negotiators designing the Kyoto mechanisms (e.g. World Bank, 2000b).

Finally, the Bank engaged in the development of baseline and monitoring methodologies. While it had already started work on this topic from 2000 onwards – e.g. promoting investment and control group analysis and calling for standardization (World Bank, 2000a, Heister, 2003) – and had developed significant internal expertise, after 2003 it had to follow the international rulebook which required submission of baseline methodology proposals to the UNFCCC Secretariat. There, proposals would be assessed by the Methodologies Panel of the CDM Executive Board and then formally approved by the latter. By providing methodologies that would pass this assessment, the Bank could show its innovative capacity. However, the Bank initially relied too much on its own influence on the rules of the game (World Bank, 2000a). Eventually, its own approaches often failed to meet the relevant criteria. In 2003 and 2004, the Bank had a share of 19.8% in all methodology submissions, but a rejection rate of over 40%, not much lower than average<sup>3</sup>. Rejections were due to problems with additionality determination where the Bank had thought that barrier tests could be sufficient, and robustness of monitoring approaches, particularly regarding the accuracy of measurement devices (ECON, 2005). Even if methodologies were eventually approved after various iterations, they often became much more conservative than initially expected by the Bank (see de Gouvello et al., 2018).

### 3.3. The World Bank during the boom of the market mechanisms, 2006-2011

The EU, Japan and New Zealand were the largest source of demand for Kyoto credits through private companies covered by emission trading schemes or voluntary agreements with their governments (Shishlov et al., 2016). During the period when the demand for credits from the Kyoto mechanisms soared (World Bank, 2010a), the Bank continued to establish new carbon funds and initiatives with different goals. They included the Umbrella Carbon Facility (UCF) with the mandate to purchase large volumes of carbon credits (2006) and the Carbon Delivery Guarantee (CDG) aiming at a reduction of the delivery risks of CDM and JI projects (2007).

On the basis of an econometric analysis of over 2,000 CDM projects registered up to May 2010, Michaelowa and Michaelowa (2011) find that the Bank did not differ from the standard CDM market players regarding its projects. The Bank tended to implement those projects that were commercially most attractive, rather than those with greater benefits to the poor. This continued engagement during the boom period focused on profits that could be reaped from the market during this period, but can also partly be attributed to the need to honour the demands of the donors that channeled money into carbon funds for bulk purchase of carbon credits. Here the Bank clearly acted as regime follower.

Another problem is that the Bank did not have a clear “sunset” clause in relation to the carbon market. A review of climate related activities of the Bank by the Independent Evaluation Group (World Bank, 2010b) states that, instead of progressively exiting the carbon markets after having invested in high risk pilot areas, the Bank continued to increase its carbon finance

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<sup>3</sup> Exact rejection rates were 40 and 43% for the World Bank and 44 and 54% for the average methodology developer, for 2003 and 2004 respectively. Calculation is based on the CDM methodology database in UNEP DTU (2019) and Annex 4 of IEG (2018). The latter does not list the rejected cases, so the assessment is conservative.



activities moving also towards lower risk segments of the carbon market, such as low-cost HFC-23 reduction projects in China. The UCF is the primary example of a trust fund set up specifically to reap the financial benefits from the largest of all CDM projects, financially extremely attractive because very small investments could trigger huge emission reductions. The first HFC-23 reduction project from South Korea submitted to the CDM in 2003 triggered a frantic search for similar opportunities by private sector and government institution buyers. As described by Michaelowa et al. (2019a) these entities rapidly identified all relevant plants in China and India and engaged in negotiations on credit sales. Rather than leaving this opportunity to the private sector, the Bank rapidly set up the UCF in order to collect funding from private CDM credit buyers and to engage in a massive HFC-23 CDM credit purchase contract (World Bank, 2006); private carbon credit brokers like Natsource scrambled to become members of the UCF (Rosenzweig, 2016). In August 2006, the UCF spent US\$737.6 million to acquire 129.3 million credits from two HFC-23 projects (World Bank, 2011b). The UCF is probably the most blatant case of the Bank clearly behaving as regime follower, running behind a market trend.

Such a boom of private activities did not happen in the forestry sector given the difficulty of guaranteeing the permanence of the mitigation benefits. Given the importance of the sector for overall GHG emissions, the Bank continued its engagement and helped to reach an agreement on avoided deforestation at the COP 13 in Bali in 2007 (Potvin and Bovarnick, 2008). The Forest Carbon Partnership Facility (FCPF) established in 2008 focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks (REDD+). The Bank thus tried to get involved in an innovative and pioneering way, serving as “agenda setter”. Up to the time of writing, however, potential financial benefits have been very limited.

The CDG, offered by the International Finance Corporation (IFC), the private sector arm of the World Bank Group, was set up to cover country and project risks regarding the total volume of carbon credits. However, this initiative did not really take off. Only three contracts were signed in 2008 / 2009. While IEG (2018) sees the reason in the “relative complexity of the CDG instrument for small-scale clients”, market observers stated that the pricing of the guarantee was unattractive.

The development of CDM methodologies by the Bank continued strongly into 2005 but then declined significantly (see Figure 1). The Bank’s share of submitted methodologies fell from 20% in 2003/4 to below 10% in 2006 and only briefly reached this level again in 2009, when bottom-up submission of small-scale methodologies had just started. From 2010 onwards, the Bank essentially stopped submitting new methodologies (only much later, in 2015, did it propose one further methodology). This confirms the impression that overall, during this period, the Bank shifted away from the role of an agenda setter towards that of a regime follower.

For those methodologies it proposed, the Bank reached an overall approval rate slightly above average. It stood out in the subfield of forestry methodologies, where it got 67% of its methodology submissions approved, compared to an average of 36% (UNEP DTU, 2019). In the forestry sector, it thus remained an important agenda setter. This is in line with the above assessment that the forestry sector constituted an exception in the orientation of the Bank’s activities during this period. The excellent forestry performance contrasted with a lacklustre performance for small-scale methodologies, which could be submitted from 2008 onwards.

During 2008-9, the success rate of the Bank in this field reached just 33%, compared to an average of 47%. Given the important role of reducing transaction costs for CDM project developers through simplification of methodologies, this failure weighed heavily.

**Figure 1: Share of the World Bank in total methodology submissions and rejection rates of Bank/all methodology submissions up to 2011 (%)**

<FIGURE 1 here>

Data source: UNEP DTU (2019)

Note: Methodology types include CDM large scale, small scale and forestry methodologies submitted through the bottom-up process.

### 3.4. The World Bank during the collapse of the market, 2012- 2015

In 2012, the Kyoto mechanisms experienced a 95% decline in credit prices and the development of new projects declined precipitously. This price crash resulted mainly from the fact that the maximum volume of credits allowed to be imported into the EU ETS was almost reached so that demand significantly declined (Michaelowa et al. 2019b). This was reinforced by lack of confidence that an ambitious follow-up regime would be agreed after the first commitment period of the Kyoto Protocol ended (2012). Essentially, the market hibernated from 2013 onwards.

The Bank was caught completely unaware by the price crash, as the Bank's behaviour as trustee of the UNFCCC's Adaptation Fund's (AF) CDM credit portfolio shows<sup>4</sup>. Between October 2010 and November 2011, the volume of CDM credits in the AF's portfolio increased from about 1.2 to 5.8 million (World Bank, 2011a, p. 21), while the average monthly credit sales volume declined (World Bank 2011a, p. 19). Had the Bank judged the market situation correctly, it would have sold every single credit as soon as possible and prevented a loss of over €50 million for the AF. Even as the price crash was in full swing, the Bank forecasted optimistic credit price levels of €3-9.3 for 2012 (World Bank, 2011a, p. 16).

While the Bank was unable to influence its industrialized country members to renew their demand for credits – i.e. it could no longer serve as an “agenda setter” - it tried to ensure the continuation of existing projects. In contrast to many private sector players, the Bank continued to honour the agreements in the ERPA's and paid fixed prices for CDM and JI credits, instead of trying to renegotiate prices or just walk away from the contracts like most private buyers located in industrialized countries did<sup>5</sup>. The Bank thereby demonstrated its continued commitment to treat developing country hosts in a fair manner.

Furthermore, the Bank launched new, but clearly circumscribed initiatives with the intention of creating demand at least in certain market niches. Given that the decline in the CDM was particularly painful for many poor African countries, the Bank stepped up its Carbon Initiative

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<sup>4</sup> The Adaptation Fund receives 2% of all issued CDM credits as an “in kind” financing. The Bank is in charge of administering the sale of these credits, obviously with the aim to maximize the revenue.

<sup>5</sup> Credit sellers from developing countries were generally unable to enforce the contracts which usually referred to places of litigation in industrialized countries and contained many complex requirements. The failure to comply with these could be used as a pretext by the buyer to state “material breach” by the seller and thus not honour the contract (see the frank statement of credit buyer Natsource in Rosenzweig, 2016: 114).

for Development (Ci-Dev) that concludes ERPA with CDM projects and programmes in low-income countries focusing on Sub-Saharan Africa (World Bank, 2015). Ci-Dev focuses on underrepresented sectors, including rural electrification, improved energy efficiency, and waste management. It thus provided a lifeline to activities that otherwise would have stalled given the market conditions. The Bank tried to sustain the regime, and did not follow the “stampede” of other actors out of the markets.

The Pilot Auction Facility (PAF) launched in 2014 – a results-based payment mechanism which sets a floor price for future carbon credits in the form of a tradeable put option, competitively allocated via auctions – targeted CDM methane projects, which were at risk of discontinuation. The PAF also demonstrated that subsidies offering a guaranteed price for future emission reductions through auctions help maximize climate impact per public dollar while incentivizing private investment in low-carbon technologies (Bodnar et al., 2018).

Besides providing financial support to projects during the carbon market crisis, the Bank actively engaged in the international debate about regulatory reforms, notably the CDM Policy Dialogue launched by the UNFCCC Secretariat in 2012. For example, a Bank study suggested the extension of standardization to monitoring and verification, project registration procedures and procedures for programmes addressing micro-scale activities (Platonova-Oquab et al., 2012). Through its annual “Carbon Expo” fairs, the Bank also provided its own forum for discussion of such regulatory changes.

### 3.5. The World Bank at the relaunch of carbon markets post-2015

Unlike the Kyoto Protocol that included new commitments only for developed countries, the Paris Agreement adopted in 2015 involves pledges for all countries; this comes, however, at the cost of increasing complexity. Instead of absolute emissions targets based on common metrics and specified in the treaty itself, the Paris Agreement allows Parties to voluntarily define their Nationally Determined Contributions (NDCs) and related mitigation targets, which are expected to become increasingly ambitious over time. While the Paris Agreement includes provisions for market mechanisms through Articles 6.2 and 6.4, their modalities and procedures have not been adopted yet. Principally, their scope could be upscaled to cover policy instruments or even entire sectors. In this context, the Bank is once again striving to become an agenda setter as it did in the early 2000s. Given that the role of governments will be larger than under the Kyoto mechanisms (due to the need to ensure that NDCs are respected on the host country side), the Bank has attempted to catalyse government engagement in the Paris mechanisms, and not engaged with private sector players as credit buyers. Still, private sector actors are mobilised by the bank in the context of the “ecosystem” of the Paris mechanisms, e.g. in the context of rating countries’ readiness for the mechanisms or as independent auditors.

In 2015, the Bank unveiled the Transformative Carbon Asset Facility (TCAF) that has the aim of developing pilot activities for up-scaled crediting under the Paris mechanisms. This facility is innovative, as it seeks to develop crediting of policy measures, such as removal of fossil fuel subsidies and energy efficiency standards. It aims to acquire US\$ 50 million worth of carbon credits per pilot activity; the activities have to be linked to a larger Bank loan.

However, the Bank has not been able to mobilize the initially desired total volume of US\$ 500 million and has thus had to start the initiative with less than half of this budget, funded by

Germany, Norway, Sweden, Switzerland and the UK. It also took more than two years to agree on the first pilot activity, an energy efficiency programme for household appliances in Indian cities, out of originally nine (Climate Cent Foundation, 2018). In contrast to the carbon funds of the early 2000s, TCAF operations are extremely opaque – TCAF neither has an annual report nor publicly available information on its activity pipeline. Currently, only TCAF donor reports by the UK’s Department for Business, Energy and Industrial Strategy (2018) or the Swiss Climate Cent Foundation (2018) allow some understanding of the TCAF’s activities. TCAF’s methodological work to date has also been carried out behind closed doors. A single discussion paper on methodological principles has been published (World Bank, 2018b), but it is much less detailed than the methodologies developed under the CDM. This suggests that the Bank may want to benefit from a first mover advantage once the new mechanisms become operational, which would increase its financial benefits in the future. At the same time, the Bank thereby compromises on its potential reputational benefits as an expert in the field.

In 2016, the Bank initiated the Networked Carbon Markets (NCM) initiative working with governments, the private sector, academia and civil society to develop and pilot innovative tools, services and institutions that could support bottom-up, linked international climate markets. This initiative attempts to define “exchange rates” between various forms of carbon credits. However, it is not yet clear whether this approach can be operationalized.

The Bank envisages becoming the heart of the potentially fragmented landscape of the Paris mechanisms; in contrast to its past strategy, where its carbon finance activities focused on mobilising projects outside its own lending portfolio, it now aspires to leverage its own projects financed through normal loans (World Bank, 2018a). Under the Kyoto mechanisms, such projects would not have passed the additionality test. Now the Bank hopes that they will generate carbon credits under Article 6. The regulatory documentation would be undertaken through a new Bank operated “Asset Development Facility”. The cornerstone of the Bank’s strategy on the Paris mechanisms would be a “warehouse facility”, which would stock the Bank’s own carbon credits as well as those of other multilateral development banks and make them available for potential buyers. It would be linked to a “transaction facility” that brings together classical carbon funds and country-specific funds, and harness innovative financial products, such as the newly launched IFC Forest Bond that pays a coupon in the form of carbon credits to bondholders. The whole infrastructure is to be set up by 2021, including a blockchain based credit registry (World Bank, 2018a).

Compared to the engagement of the Bank in the Kyoto mechanisms, the new strategy is much bolder and more far-reaching. On the one hand, this represents once again an innovative, agenda-setting approach to bring together different public actors, now mostly public ones. On the other hand, the setup also suggests an attempt to reap direct financial benefits out of projects that are questionable with regard to their additionality, with potential detrimental impacts not only on the Bank’s reputation, but also more broadly on tackling climate change. In this sense, the Bank is trying to act as a regime follower for its own projects, while it sets the agenda for the activities of others. Which role will become predominant remains to be seen.

## 4. Discussion

The World Bank's involvement in the carbon market has often included innovative activities, like the development of new methodologies and the setup of trust funds to pilot new markets and to support the creation and functioning of carbon markets. These activities aimed at catalysing private and public action, for example by setting up trust funds where both types of actors could participate. Here the Bank acted as an agenda setter. However, in some periods the Bank also engaged in more standard activities, like project development, and purchases and sales of carbon credits, just like any private firm active on the market. These activities can be characterized as those of a regime follower. While the former role has primarily led to reputational benefits, the latter role has risked damaging the Bank's reputation, while also generating substantial financial benefits.

The empirical evidence presented above clearly shows that financial benefits lured the Bank into continuing its activities when the markets functioned well, and to even focus on activities clearly competing with the private sector, rather than to concentrate on further forward-looking innovative activities. During the boom phase of international carbon markets, the latter also continued, but only as a relatively minor activity with a particular focus on forestry.

Even in the troubled phases of international carbon markets - the starting phase, the crash period and the difficult relaunch under the new setting of the Paris Agreement, when financial attractiveness was very limited - the Bank has never abandoned its active involvement. While its level of activities remained somewhat muted during the downturn of the Kyoto mechanisms between 2012 and 2015 (when it could be considered a regime follower), it still attempted to come up with ideas at least for some niches of the carbon market. In the post-2015 period, innovative activities have dominated, even though the prospect of future financial benefits influenced their design. Thus, we could see a re-emergence of regime following by the Bank once the new market mechanisms have been firmly established. Overall, in the more difficult periods, the Bank consistently made use of its expert knowledge in the field, and engaged as an innovative actor, pioneering new activities and discussing them in policy dialogues. This role – being an agenda setter - is in line with its mandate and vision.

One might wonder why the Bank has not been even more active during the downturn of the market. If it had been able to rescue the markets rather than to focus only on marginal activities, this could have led simultaneously to reputational and financial benefits. Since the Bank did not anticipate the price crash, it financially suffered from it just as any other market participant. Hence, with all its economic and technical expertise, it was simply unable to come up with convincing solutions for the political impasse that had occurred and triggered the crash. At the same time, after the financial crisis, generic mistrust in financial and other markets more generally quickly spread among political activists, NGOs and large parts of the population. In this situation, it was more difficult for the Bank than it would have been prior to the financial crisis to reap reputational benefits from activities to rescue carbon markets. This may also have contributed to the Bank's reluctance to become more strongly active in this phase.

To depict the different phases graphically, both regarding the development of the market and the development of Bank activities, we need a common metric for World Bank activities that remains relevant over time.

Figure 2 shows the Bank's development of new trust funds (dotted blue line) as compared to the development of the international market mechanisms measured by the development of prices and volumes in the context of the CDM. The development of CDM credit (CER) prices (dashed green line) clearly traces the boom and bust phases as discussed above. The recovery in 2018 is limited to a few market niches in which trading still takes place. The traded volumes declined even earlier as a consequence of the financial crisis in 2008 that led to reduced economic growth, a related decline in emissions, and hence a reduced demand for CERs in their main markets, the EU and Japan.

The figure clearly shows that Bank activities preceded the creation of the market. Similarly, there is a peak in Bank activities starting in 2015 with the Paris Agreement. These were periods in which no financial gains could be expected, but the Bank came up with a number of innovative activities. There is yet another peak, however, in the boom period of the CDM, with several new funds created, notably in 2008. They show that the Bank also kept up its activities during the time when the market functioned well. As discussed above, it simply followed the market here, and several of the funds created also reflect this in their orientation (notably the UCF intended to reap financial benefits from large HFC-23 projects).

**Figure 2: World Bank-creation of trust funds, CDM market price and volumes 2000-2018**

<FIGURE 2 here>

Notes: CDM volumes and prices refer to the primary market; volumes also include forward sales that declined following the financial crisis. Bank trust funds do not include financial investment funds for which the Bank has no substantive, but only a financial responsibility. We only include the main trust funds, and do not count complementary administrative units without own disbursements even if they are listed separately in the Bank's trust fund database.

Data sources: World Bank (2004-2011), Point Carbon (2012-2014), Thomson Reuters (2015-2018), Refinitiv (various years), World Bank (2019)

Overall, it seems that the Bank's own institutional objectives and related incentives have led it to serve its catalysing function relatively well. The only caveat is that a "sunset" mechanism seems to be missing that would induce the Bank to step back when markets actually work well. In this context the financial objective of the responsible administrative units within the Bank seems to override other concerns. This may be an issue to consider at the level of the Bank's Executive Board, and with donors of individual trust funds. The latter need to agree on how to use remaining funding once the catalysing objectives have been reached.

In the current period of cautious attempts to rebuild the international carbon market after its complete crash, this is less of a concern. Given its past performance, the Bank can be expected to contribute actively to shaping the future of this market. Firstly, it can continue supporting the regulatory side, by supporting governments in the operationalization of Article 6 domestically and identifying the most appropriate domestic policies for incentivizing mitigation actions. Furthermore, it can leverage its funds to design and implement, in the short term, pilot activities regarding: a) transition of high-quality CDM and other activities into the Paris mechanisms, and b) actual implementation of the Paris mechanisms (once their rules have been agreed). The first is necessary to provide a lifeline to private companies that have suffered from the CDM crisis. It would increase private sector confidence that its

mitigation investments will continue to generate credits and related revenues post-2020. The second refers to the need for building actual expertise and knowledge. Rebuilding trust in the international carbon market is a priority given the current status quo of low demand and low prices, and also considering the previous negative experience of private investors with the volatility of the CDM and the inability of the international community to establish a stable and long-term framework for market-based mitigation actions. In that context, it is important that the Bank designs its pilot activities in a way that is seen as supporting market development in general and not as an attempt to control the market. Furthermore, it should be ensured that the mechanisms proposed by the Bank do not retreat behind previously agreed quality criteria, notably with respect to the additionality of mitigation efforts. Finally, coordination of various carbon finance activities among major international actors is required in order to avoid duplication of efforts and enable synergies.

## 5. Conclusions

Achieving the key objectives of the Paris Agreement requires a collaboration of public and private actors, as public funding alone cannot ensure success. The development of an international carbon market since the late 1990s brought together public and private institutions. While the overall regulatory framework was provided by the Kyoto Protocol and is now being re-established under the Paris Agreement, the World Bank has contributed substantially to the development of the international market and catalysed private and public activities as an agenda setter. In order to maximize the sustainable engagement of the private and public sector in post-Paris carbon markets, the Bank should build upon its own best practices and avoid repeating past mistakes, when it acted as regime follower. We therefore recommend the Bank to:

- Ensure that its carbon-market activities catalyse the involvement of the private sector and governments rather than compete with it.
- Create clear “sunset clauses” of activities and have a corresponding exit strategy once markets become operational and the private sector is sufficiently involved.
- Spearhead efforts to improve the quality of carbon credits, rather than to reduce additionality requirements, and also ensure social and economic sustainability.
- Increase transparency of its carbon market activities in order to allow for public scrutiny and ongoing improvement, as was the case with the early CDM activities.

The World Bank has shown different faces in the first 20 years of international carbon markets, as conflicting incentive structures have led to an oscillation between the role of an agenda setter and regime follower. We would call on the World Bank member countries to guide the institution towards a more consistent agenda setting role, which enhances the functioning of the markets instead of competing with other players. The strong human and financial capacity of the World Bank can be crucial to successfully overcome the challenges faced by carbon markets, such as continued conflicts between governments on the design of market rules and the need to ensure consistency with the long-term targets of the Paris Agreement.

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