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# The role of the financial services industry in the clean development mechanism: involving private institutions in the carbon market

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**Abstract:** This paper highlights the functions performed by the financial services industry in the clean development mechanism (CDM) of the Kyoto Protocol. The CDM enables industrialised economies to meet their emission reduction targets while supporting environmental projects in developing economies. Since the Copenhagen Summit did not give a satisfying response to the future prospects of the carbon market, reliance has increasingly been placed on private actors in order to keep developing the carbon market architecture. Financial institutions are involved in the CDM market as pooling and transferring economic resources in order to develop CDM projects; they can also enhance market liquidity while trading carbon certificates. The financial services industry is active in the CDM market, providing evidence of the necessity to encompass private institutions in the efforts to tackle climate change. This paper shows the benefits of financial intermediation in the CDM market and also explains some shortcomings.

**Keywords:** climate change; clean development mechanism; CDM; financial services industry; carbon fund; insurance; carbon certificates; carbon market.

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## 1 Introduction

The Copenhagen Accord is merely of a political nature since participating countries failed to achieve a global adoption of legally binding emission reduction targets at the climate change summit in December 2009.<sup>1</sup> Accordingly, the *Copenhagen Summit* has not fulfilled market participants' expectations and has raised uncertainty regarding the pursuing of the Kyoto Protocol post-2012. Such regulatory issues have direct repercussions on the behaviour of market participants in the carbon market. Indeed, market participants reacted to the modest outcome at Copenhagen and certified emission reduction (CER) prices fell in December 2009.<sup>2</sup> In the aftermath of the Copenhagen Summit, the value of the carbon market is declining in 2010 and carbon prices will tend to stabilise at a lower

level than in 2009.<sup>3</sup> Nevertheless, the *clean development mechanism* (CDM) may move forward despite the absence of a binding agreement in Copenhagen due to the fact that the CDM Executive Board is required to improve the regulatory steps as regards the CER issuance process. Moreover, the fact that countries agreed on short-term CDM reform can be interpreted as a sign that the CDM benefits from widespread support.<sup>4</sup> The Copenhagen decisions also encourage countries to continue cooperating bilaterally to develop and implement CDM project activities.<sup>5</sup> Overall, the decisions made in Copenhagen relating to the CDM should speed up the time it takes to get CER issued.<sup>6</sup>

The failure to achieve a legally binding agreement in Copenhagen has enhanced the role that can be played by the financial services industry in the whole carbon market and in the CDM in particular. For instance, some carbon funds and banks are increasingly looking at making deals more risk-proof to protect against policy failures.<sup>7</sup> Regulatory risks must be accounted for in investment decisions and agreements between contracting parties may take advantage of including risk allocation terms in their carbon deals. The underlying aim of the paper is to define and analyse the various *functions performed by the financial services industry in the proper functioning of the CDM*.

The private sector is primarily involved in bringing together sellers and buyers of carbon certificates. It is worth mentioning that the establishment of emission trading schemes results from efforts made to internalise the environmental costs of greenhouse gas emissions (GHG).<sup>8</sup> Once carbon certificates are created, they can be exchanged in the carbon market at a price set by the market participants.

The whole market is commonly referred to as the carbon market. The first type of programme under the flexible mechanisms of the Kyoto Protocol consists in a *cap-and-trade system* restricting the quantity of emission certificates available to the market. Carbon units have a value due to their artificial scarcity.<sup>9</sup> While a carbon tax system fixes the price and the quantity of GHG emissions generated will depend on the fixed price, a cap-and-trade system drives the quantity available in the market, and thereafter the price depends on the fixed quantity.<sup>10</sup> Participating countries are first aiming at reducing emissions and can, in addition, trade allowances to meet their compliance obligations.<sup>11</sup> In simple terms, countries having a surplus of emission certificates sell them to countries not having enough emission certificates.

Apart from the cap-and-trade system, GHG emission reductions under a project-based programme involve a *baseline-and-trade regime*.<sup>12</sup> In particular, the CDM enables countries or companies to meet reduction targets under the Kyoto Protocol or other policies while buying credits generated by reporting emission reductions in developing economies.<sup>13</sup> Carbon credits resulting from the CDM are called CER. Countries which are not subject to binding GHG emission reductions can also be involved in a project-based carbon market. Therefore, the CDM has the double aim of fostering sustainable development in developing countries and reducing GHG emissions.<sup>14</sup> The CDM is based on the assumption that the location of GHG reductions is irrelevant.<sup>15</sup>

Rather, attention has been paid to the *concept of additionality*, i.e., the GHG emissions need be less substantial than what would have occurred without the credit programme.<sup>16</sup>

If the global carbon market is dominated by carbon certificates arising out of the *European Emission Trading Scheme (EU ETS)*, the CDM extends in the second place to a worldwide scale. In terms of transaction volumes, the CDM market represents one third of the global carbon market.<sup>17</sup> In November 2010, there were nearly 450 million of CER issued in the carbon market; further, the total amount of accumulated CER expected to be created before 2012 is over 2,800 million.<sup>18</sup> Since the CDM became operative in 2005, the market has grown at an extraordinary pace. Especially during 2008, regulators and financial institutions were struggling to keep pace with the huge momentum of CDM project activities. Demand comes mainly from private sector entities in the European Union, but also from European governments and Japan.<sup>19</sup> On the supply side, China and India have been the world's

largest sellers of CER since both governments regard the resulting inflow of foreign investment as a considerable advantage for their economies.

From a market perspective, the CER consist in tradable carbon units. Therefore, the financial services industry may intervene in the trading process. For instance, private institutions can be involved in *brokerage, fund raising and insurance activities*. Financial intermediaries exert their activities at every stage of the carbon market. They facilitate agreements in the primary market, i.e., during the registration and issuance process. They are also present in the secondary market, i.e., when the generated CER can be exchanged by market participants.

Hitherto, the CDM market has been an extremely volatile market subject to significant price fluctuations. Experience and less uncertainty about its future prospects should lead the carbon market to a mature phase and convey the credibility needed in view of achieving a certain degree of market stabilisation. Furthermore, the financial services industry should be in a position to make the market more liquid, more efficient and less volatile.<sup>20</sup> In the future, the existence of historic track records should help market participants better understand the market developments. Many factors influence the CER prices. Above all, the price differences between the primary – i.e., the market for CER issuance – and the secondary CER market give rise to concerns. Price mismatches logically reflect the higher risks taken in the primary CDM market. Buyers are willing to pay more for issued CER than for CDM project activities. Too low CER prices will suppress the prices paid for CDM project activities, thereby compromising their implementation. Therefore, *liquidity and transparency* are required in the global CDM market in order to foster *price discovery mechanisms*.

In view of the vast literature recently published, this paper concentrates on the *legal aspects* related to the implementation of the CDM by the financial services industry. The authors proceed on the assumption that the proper functioning of the CDM market depends on the appropriateness of regulation and on adequate functions executed by *financial intermediaries*. While substantial research has already been carried out dealing with regulatory issues, little has yet focused on financial intermediation. Therefore, the paper makes an original contribution to the research field due to the emphasis put on the involvement of the financial services industry in the CDM market.

It is worth mentioning that the financial services industry encompasses financial intermediaries as private actors performing key functions in the financial markets.<sup>21</sup> In the broader sense, financial intermediaries include depositary intermediaries such as commercial banks, and non-depositary intermediaries such as insurance companies, pension funds, mutual funds and investment banks.<sup>22</sup> Financial intermediaries provide information for two kinds of applications:

1. to match transactors
2. to transform the nature of claims and manage risks.<sup>23</sup>

In the CDM market, attention has hitherto been paid to non-depositary intermediaries such as brokers, carbon funds, traders and to a lesser extent to insurance companies. The involvement of financial intermediaries in the CDM has advantages in view of making the market more efficient and resilient. The current situation is though not entirely satisfying and improvement is expected in the future. The CDM market should for instance incorporate *basic principles related to banking and insurance activities* in a more comprehensive way.

## **2 A brief overview of CDM market regulation**

### *2.1 Regulatory incentives and the CDM programme*

Tackling global climate change requires the involvement of every country in the process. Yet concerns have been raised about difficulties in getting developing countries to participate in an

*agreement*. Developing countries have so far focused on building up their economies and commitments could preclude them from growing fast.<sup>24</sup> Without their participation, an agreement would, however, be of limited use and could even be counterproductive.<sup>25</sup> The market mechanisms established by the Kyoto Protocol would completely fail if GHG emission reductions in one part of the world caused GHG increases in other parts.<sup>26</sup> The CDM was partly established to address this problem.

The CDM allows industrialised countries to finance carbon projects in developing countries that have not made commitments to reduce their GHG emissions.<sup>27</sup> The CDM intends to *satisfy the needs of both industrialised and developing countries*. On the one hand, industrialised economies can fund environment-friendly projects in anticipation of receiving carbon credits allowing them to meet their reduction targets at a lower cost.<sup>28</sup> On the other hand, the CDM enables developing countries to support their economies in a sustainable way thanks to the funding of industrialised countries. The CDM is considered as the best means to direct developing countries towards emission reduction strategies and to promote sustainable development.<sup>29</sup> For developing countries the CDM is an opportunity to ensure long-term, sustainable and equitable development.<sup>30</sup> Further, the CDM incentivises the transfer of clean technologies since a company which develops a technology and exports it in developing countries can generate carbon credits.<sup>31</sup>

Therefore, the CDM's most important strength has been its ability to bring developing and developed countries as well as the public and the private sectors together in order to reduce emissions at low cost.<sup>32</sup> In short, the ideas underlying the CDM are *cost-effectiveness and irrelevance of the GHG emissions' location*. Attention needs to be paid to the regulatory process linked to the creation of a carbon market. In this regard, the concept of additionality refers to an essential requirement for project developers. GHG emission reductions are considered additional if they would not have occurred in the absence of the CDM programme.<sup>33</sup> In other words, a credit is environmentally additional if it produces outcomes which would not have occurred under a business-as-usual scenario.<sup>34</sup> The underlying objective of the CDM programme is, therefore, that emissions are effectively reduced on a global basis.

## 2.2 The CDM project cycle and the regulatory barrier to entry

CDM projects have to go through the project pipeline prior to generating carbon credits. Since carbon credits are created in the process, the part of the market dealing with CER issuance is referred to as the primary market. The CDM Executive Board is the regulator and supervisor of the CDM project activities. The issuance of CER can occur only after completion of regulatory steps. The long *process conducting to the registration of CDM projects* and issuance of CER implies that CDM projects are delayed in the pipeline for a certain time. At the end of October 2010, more than 5,600 projects were in the CDM project cycle, of which roughly one-third were registered, while roughly two-thirds were at the validation stage.<sup>35</sup> The difficulties resulting from the issuance process require the involvement of financial intermediaries as key private actors enabling agreements between CDM project participants. The financial services industry is namely in the position to help market participants overcome regulatory risks and the regulatory barriers to entering the CDM market. Therefore, the project cycle has direct repercussions on the role of private market participants in the CDM market.

It is worth describing the *regulatory steps leading to the issuance of CER*. The first phase consists in the approval of the CDM project. Each country participating in the mechanism accredits a *Designated National Authority (DNA)* responsible at a national level for granting approvals to projects that fulfil national criteria for sustainable development.<sup>36</sup> Basically, buyers will require approval from the DNA of the home country and sellers will require approval from the DNA of the host country. The second stage consists in an independent evaluation of an envisaged project by a *Designated Operational Entity (DOE)*. A DOE1 must validate and subsequently request registration of a proposed project activity, using an approved methodology.<sup>37</sup> Eventually, the DOE1 submits a validation report to

the Executive Board, thereby confirming that the preset requirements are met. The third step is the project registration, i.e., the Executive Board's formal acceptance of a validated project.<sup>38</sup> The fourth phase involves a DOE2, which monitors the project performance, thereby verifying and certifying the emission reductions of a registered project activity. At this stage, the project participants implement the project activity. The main function of the DOE2 is to check whether realised projects cut emissions in line with what was promised. Lastly, the Executive Board issues CER after receiving a request from the DOE2.

Key regulatory issues relate to regulatory risks and high transaction costs. The use of market mechanisms brings along the need of a *competitive environment*.<sup>39</sup> Price finding is achieved through the interplay of supply and demand. However, the governance structures established by the Kyoto Protocol may erect high regulatory barriers for potential entrants of the CDM market. The CDM project pipeline contributes to procedural inefficiencies, such as uncertainty in respect of the completion of projects and delays in CER issuances.

The regulatory risk poses problems for CDM projects. Primary project developers face delays in financing and implementing projects because of the delays arising from the CDM project cycle, which dampens enthusiasm for further innovation.<sup>40</sup> They may even be dissuaded from registering and requesting CER issuance due to the rigorous CDM process regardless of the worthiness of their projects.<sup>41</sup> Eventually, buyers may prefer other means to meet their reduction targets without caring about higher prices. For instance, the price difference between CER and European Union Allowances (EUA) partly accounts for the fact that, due to the registration and issuance process, there is more *delivery risk* with CER than with EUA.<sup>42</sup> In addition, significant *transaction costs* are associated with project approval and registration process.<sup>43</sup> These costs further exacerbate the barrier to entry, thereby being considered as an impediment to CDM project development. For smaller projects, CDM transaction costs can make a project financially unviable.<sup>44</sup>

A specific problem consists in the fact that the regulatory process may not lead to the best *selection of good CDM projects*. Indeed, projects that really need the carbon payments to overcome hurdles are more likely to fail as a result of these delays; conversely, projects being not as reliant on carbon payments for their construction and implementation are more likely to be able to take the financial hit from the delays.<sup>45</sup> Furthermore, the regulatory barriers to entering the CDM market works against the goal of additionality. Indeed, additionality is jeopardised by the fact that the regulatory barrier may preclude good projects from entering the CDM market. Project activities which would have occurred even without the funding based on the CDM programme may have an advantage as compared to projects that really need financing. Transaction costs involved in developing new projects are so high that it only becomes worth incurring the extra costs if much of the work for the project would have been done anyway.<sup>46</sup> Therefore, there are some irregularities due to the CDM project pipeline giving rise to concerns as to whether the financial services industry can help make the CDM market more efficient.

### **3 Fostering market activity**

#### *3.1 Current roles of the financial services industry in the CDM market*

The financial services industry helps to bring together buyers and sellers of carbon certificates. For instance, private actors have a role to play in solving regulatory inefficiencies which are due to the CDM project pipeline. The 'learning by doing' approach adopted in the carbon market implies that it takes years before the proper *institutions* are in place. After creating the carbon market and allowing the exchange of carbon certificates, regulatory institutions must still count with the fact that market participants need a certain time to adapt to the regulatory framework and perform the related market functions. The rationale of a free carbon market is that the necessary institutions will automatically be

created according to the market participants' needs and without the help of state interventionism. The CDM is indeed a project specific mechanism to operate on market terms, supposed to rely predominantly on private sector initiative drivers.<sup>47</sup>

Accordingly, financial intermediaries may perform crucial functions while screening projects of high quality so that diligent and reliable project developers are preferred. They may also be able to help project developers and end buyers overcome the regulatory hurdles associated with the issuance of CER. Due to their proximity to the CDM project, they are in the position to monitor participants all along the registration and issuance process. Financial intermediaries can also allocate the regulatory risks resulting from the project pipeline, thereby making agreements possible between project developers and end buyers. For instance, carbon funds are able to invest in smaller CDM projects, which would not occur without their help due to the high transaction costs caused by the regulatory steps. Further, the financial services industry plays a role in the *secondary CER market* as well. The secondary market deals with the exchanges of carbon certificates once CER have been issued. One CER represents one metric ton of carbon dioxide equivalent, i.e., a carbon unit. No tangible certificate is created upon issuance, but CER exist within electronic databases confirming the existence of the output.<sup>48</sup> Carbon units are first and foremost accounting units tracked and recorded through the CDM registry or any subsequent national registry and they have their own unique serial numbers.<sup>49</sup> The right to emit GHG can be transferred, and carbon units constitute tradable units. The product which market participants purchase in the secondary market is the CER. Carbon units generated under the CDM are therefore standardised emissions offset instruments. Within a homogenous market, they can be traded like generic goods. The activities of financial intermediaries may enhance liquidity in the secondary CER market, thereby reducing market volatility and aiming at achieving a higher level of price stability.

Trends can already be observed as regards the involvement of the financial services industry in the CDM market. Broadly speaking, private actors offer an *increasing range of services related to emission trading*.<sup>50</sup> The carbon market is a promising sector and will most definitely keep growing at a rapid pace in the future. The CDM market is especially suitable for financial institutions such as traders, brokers, investment funds and institutional investors. The market is, however, not very open for ordinary and unsophisticated investors. Participating entities must have the necessary knowhow and understand the technical and organisational aspects of the CDM market. At present, it appears that only large consulting firms and financial institutions from developed countries have the financial savvy to supply services and frame deals among entities wishing to buy and sell emissions rights.<sup>51</sup> In the future, the CDM market should further open up to commercial banks and insurance companies.

### *3.2 Supply and demand in the CDM market*

On one side, the supply in the CDM market accrues from project developers in developing countries. Projects generating GHG emission reductions may benefit from the market mechanisms under the Kyoto Protocol even if these projects occur in countries having no reduction targets to meet. States and companies in the developing world can take advantage of carbon finance to raise funds for their own projects.<sup>52</sup> In principle, project owners need financing prior to carrying out the project. The cash flows arising from the CDM enable them to materialise the project. Therefore, the opportunities to get auxiliary funding incentivise them to implement environment-friendly projects.

On the other side, ultimate buyers or end buyers need the carbon certificates for their own account. They are divided in two categories:

1. Compliance buyers comprise *industrialised economies or companies having emission reduction targets*. On the one hand, the legally binding reduction targets can directly arise from Kyoto-related commitments. Industrialised countries have agreed to reduce their GHG emissions to

a certain extent as compared to the year 1990. Pursuing to the flexible mechanisms, the purchase of emission reductions credits, such as CER, helps to overcome a scarcity of emission certificates. On the other hand, some national programmes have established their own emissions trading systems. If they link their systems to the flexible mechanisms under the Kyoto Protocol, companies having reduction targets under a national programme are in a position to purchase the carbon credits arising out of the CDM to satisfy their commitments.<sup>53</sup> The most important regional system is the EU ETS.<sup>54</sup> This programme is linked to the CDM so that installations under the EU ETS can use CER to comply with their caps up to a specified percentage.<sup>55</sup>

2. Outside of the regulated markets, the project developers can also sell carbon credits to the voluntary carbon markets.<sup>56</sup> These markets encompass voluntary commitments addressing climate change; such commitments directly arise from the private sector and hint at the role played by voluntary efforts. A voluntary carbon market has for instance developed in the USA. Broadly speaking, the *Voluntary Carbon Standard (VCS) programme* aims at providing transparency and credibility to the voluntary offset market through the establishment of standards. Carbon credits under the voluntary market are called voluntary carbon units (VCU). Besides, the VCS recognises project activities around the world and approves the CDM programme. Therefore, companies participating in the voluntary offset programme can purchase CER and choose to have them transferred into VCU.<sup>57</sup>

Overall, the interests of project developers and CER buyers are aligned insofar as both sides want to maximise CER volumes.<sup>58</sup> However, buyers are interested in buying CER as cheap as possible and sellers insist on a CER price above a certain level. If CER supply increases as compared to CER demand, the CER price tends to fall, which runs counter to sellers' interest.<sup>59</sup>

### 3.3 Financial intermediaries increasing market efficiency

The idea of transferability of the issued CER is already embedded in the use of market mechanisms to tackle GHG emissions. Fungibility is an essential requirement to the success of the CDM.<sup>60</sup> In fact, trade facilitates price discovery mechanisms and a certain level of market activity helps to guarantee the stability of the CDM market. Accordingly, concerns have been raised about how to promote exchanges in the CDM market.

Attention needs to be paid to the materialisation of *exchanges in the CDM market*. In any case, the countries or companies that need emission certificates can directly enter in contact with project developers. However, difficulties emerge since imperfect information implies that it takes time for parties to find each other. Making available adequate information is necessary to facilitate proper contracting. Moreover, market participants must comply with governance mechanisms and face high costs to find projects and partners.<sup>61</sup> Furthermore, market participants have different expectations, and financial intermediaries are able to conciliate their needs, thereby permitting transactions to occur in the CDM market. Consequently, financial intermediaries are essential market actors of the CDM market.

Various kinds of financial intermediaries play specific roles in the CDM market: First, *electronic platforms for exchange* provide data about buyers and sellers of CER as well as the market price for CER. Some examples are European Climate Exchange (ECX), European Energy Exchange (EEX), Climex, BlueNext, Asia Carbon Exchange, Intercontinental Exchange (ICE) and Chicago Climate Exchange (CCX).<sup>62</sup> When a transaction is validated, these platforms are in principle responsible for settlement and delivery of CER. In fact, the delivery of CER means that the transaction registries complete the transfer of the CER. Further, the UNFCCC CDM Bazaar is a platform for exchange of information on CDM.<sup>63</sup> Second, *brokers* are involved in finding counterparties. The broker provides this service against

payment of a fee. As a result, buyers and sellers directly contract with each other. For instance, the leading global company engaged in brokering activities is CantorCO2e.<sup>64</sup> Third, *traders* purchase CER for their own account. Their primary activity consists in buying and selling at profit. They contribute to the development of CDM projects by having portfolios of carbon credits. One of the biggest generators of CDM credits is the London-listed EcoSecurities, which also appears as a big project developer.<sup>65</sup> Camco is also a dominant carbon firm in the CDM market.<sup>66</sup> These carbon companies are international leaders in the climate change business and they already have strong records in making profits in the carbon market.<sup>67</sup>

### 3.4 Carbon contracts and CER prices

Innovative instruments have been introduced into the CDM market, satisfying the needs of various market participants with specific interests. The financial services industry adopts a pioneering approach in order to develop the relatively young CDM market. If the market mechanisms have been introduced by regulatory intervention, financial innovation has been driving the carbon market's growth to a new level. Financial institutions may supply a wide range of financial services until a deal for transfer of CER is concluded, such as brokerage, trust, clearing, and settlement.

#### 3.4.1 The creation of innovative financial products in the CDM market

In the primary CDM market, the parties involved in the CDM conclude *emission reduction purchase agreements (ERPA)* leading to contractual commitments. An increasing number of carbon contracts are becoming available. Contracting structures are getting very sophisticated in view of marketing the CER. As project developers are able to obtain financing for their projects without taking into account a fixed cash flow from the sale of CER, they can choose whether to sell their CER under a forward contract or wait until the CER are issued and sell them on the spot market.<sup>68</sup>

Most ERPA are *forward contracts*. These contracts are individually negotiated and not standardised. They are thus traded over-the-counter (OTC-traded).<sup>69</sup> In such contracts, the buyers and sellers fix the price, the timing of the delivery and the volume in advance of the carbon credits being generated.<sup>70</sup> For many project developers, the forward sale of CER provides an important opportunity to obtain additional cash flow for their project.<sup>71</sup> In addition, buyers take advantage of spot trading due to immediate settlement. *Spot contracts* are usually highly standardised and fairly simple documents. The secondary CER market is characterised by the presence of many spot contracts. Further, price volatility can partly be neutralised through the use of derivatives such as futures.<sup>72</sup> Financial intermediaries' market activity enhances the liquidity of the secondary CER market, thereby tending to achieve a certain level of price stability. Finally, other types of contracts exist, such as *CER swaps, strips and options*. These derivatives can serve as instruments to hedge price movements of the underlying carbon units, which is a particularly useful purpose at the most volatile stages of the CDM market.<sup>73</sup> These tools enable companies to manage their exposure to market fluctuations prudently.<sup>74</sup> For instance, a call option gives to a company the right, but not the obligation, to buy a specified quantity of certificates at a fixed price within a specific time period, notwithstanding the actual market price. The company can take advantage of such an agreement while benefitting from enhanced flexibility. At the time of contracting, the company envisages that it will need a certain amount of certificate at a future date, but it is not sure and fears an eventual CER price increase. The company may conclude a call option, thereby agreeing to pay a premium today in order to make sure that it can buy CER at a later date at a specific price. Basically, the financial intermediary selling the call option will make a profit from the contract if the buyer chooses not to exercise the right to buy the CER, which will namely occur if CER prices do not rise or if the company can get the needed certificates through another channel. If these financial products enhance market liquidity and contribute to create an increasing level of market stability, they do not, however, consist in establishing comprehensive risk

management practices. Derivatives can hedge market participants against certain risks such as price fluctuations, but they cannot serve as full insurance products.

#### 3.4.2 *The pricing mechanisms*

The carbon market acts as a pricing mechanism and price fluctuations reflect the interplay of supply and demand.<sup>75</sup> In the primary CDM market, the negotiation of contract terms encompasses the *price finding process*. Since CER contracts are not standardised, CER prices depend, to a large extent, on the risk allocation terms between the buying and selling parties; the primary CDM market is likely to remain non-standardised with individualised terms and prices.<sup>76</sup> In this segment, most contracts are thus OTC-traded. The secondary CDM market tends to be more transparent and standardised. Price discovery mechanisms can be facilitated by carbon exchanges. The CDM market is, however, characterised by a low degree of liquidity and high volatility. The level of market activity is not high enough to promote market stability. The concentration of large volumes of carbon units in the hand of a small group of dominant players can be prejudicial to price finding in the carbon market due to enhanced risks of market manipulation.<sup>77</sup> Few market players may indeed be able to trigger the price fluctuations at their convenience, thereby distorting carbon prices. Therefore, an increasing level of *market liquidity* is necessary so that the CDM market becomes less subject to uncompetitive practices of few market participants.

To some extent, pricing mechanisms have already been developed in the CDM market. Price differentiations arise between different types of transactions. The market has developed an increasing understanding of the *risk premiums* associated with the different types of contracts. First, the more risks the supplier agrees to assume, the higher price the buyer will be prepared to pay. Second, CER prices tend to increase as the project advances in the CDM project pipeline.<sup>78</sup> Notably, higher prices reward registered CDM projects. Third, spreads reflect the different risks taken in the primary and the secondary CDM market. Doubts about timely delivery of issued CER volumes have recently widened spreads by boosting demand in the secondary CER market as buyers seek compliance security.<sup>79</sup>

Low *energy prices* create a downward pressure on carbon prices.<sup>80</sup> Since the economic recession has seen reduced industrial output in Europe and consequently lower emissions, CER demand has dropped, thereby implying a carbon price collapse.<sup>81</sup> When CER prices fall in the secondary market, spreads tighten between the primary and secondary market. Market participants get a lower margin while developing CDM projects and selling the issued CER in the secondary market; therefore, liquidity goes down and a market contraction occurs.<sup>82</sup>

Later in 2009, CER prices went up. Due to the delays in the CDM pipeline, concerns have shifted in the CDM market and been raised about the likely supply of carbon credits from developing countries.<sup>83</sup> Therefore, the interplay of supply and demand really drives prices and the financial services industry can play a role in making the market more stable while providing exposed market participants with carbon derivatives enabling them to hedge against price fluctuations.

#### 3.4.3 *Promoting transparent prices in the CDM market*

Transparency is an important objective in the carbon market. Transparent contracting practices facilitate price discovery mechanisms. Efficient markets ensure that the GHG emission reductions are met at the lowest available cost.<sup>84</sup> However, the CDM market continues to be characterised by a low degree of transparency.<sup>85</sup> The lack of transparent market activities may even impede the efficiency of the CDM market. The development of additional platforms for auctions could for instance help reduce the gap between the primary and secondary markets.<sup>86</sup> If market participants and financial intermediaries are incentivised to *trade on exchange instead of through OTC markets*, relevant information would increasingly be disclosed to the benefits of market actors and regulators.<sup>87</sup>

Prices in the primary and in the secondary market are closely linked with each other. Spreads reflect the enhanced risks taken in the primary CDM market. If the market is characterised by a sufficient level of transparency, it is able to adjust prices on its own. For instance, opportunities of elevated *profit margins* arise when the prices are too high in the secondary market since the market participants would take advantage of purchasing certificates in the primary market and selling them to end buyers. The resulting demand would cause the prices to rise in the primary market. Consequently, in an efficient market the price difference between the primary and secondary market would merely correspond to an elevated risk premium for the primary market.

From another perspective, the liquidity of the primary CDM market is jeopardised if the CER prices are too low in the secondary CER market. On the one hand, buyers only agree to pay for the issuance of certificates in the primary market if the risk taken is rewarded. On the other hand, project developers are not willing to sell their product at a low price. During the financial crisis, sellers in China have expressly insisted on prices above a certain level to issue primary CER, i.e., at least 8.5–9 Euros, while buyers were not ready to buy CER from the primary market at less than a 2–3 Euros discount.<sup>88</sup> China has thus imposed an *unwritten floor price on the sale of CER*, which is enforced through a refusal to approve projects where the purchase price is unacceptably low.<sup>89</sup> Furthermore, when prices drop in the secondary CER spot market, this phenomenon has an influence on the behaviour of buyers in the primary CDM market. In fact, since the primary market mainly involves forward contracts, investors will be reluctant to execute their contracts and may even breach them since they prefer to buy at a low price in the secondary CER market. Therefore, the prices in the secondary CER market play a crucial role in ensuring market liquidity. Too low CER prices may even hamper the viability of the whole CDM market.

Even though the financial crisis brought suffering to many in the environmental finance community, *trading volumes* continued to grow and carbon exchanges were one of the few parts of the carbon market to see real benefits from the crisis since the simplest way to install a safety net on OTC deals was to bring them on an exchange for clearing.<sup>90</sup> The fact that activity on carbon exchanges increased in the aftermath of the financial crisis is a positive signal. The number of exchanges launching carbon contracts is high in comparison with other market products. In other markets, the dominance of one exchange typically deters others from launching similar contracts; there are consequently very few examples in futures trading worldwide showing comparable trading volumes across several exchanges.<sup>91</sup> In the CDM market, new developments have occurred in the sense that secondary CER tend to be increasingly traded on exchanges. For instance, Nord Pool launched CER spot contracts on exchange in November 2009.<sup>92</sup> Therefore, private market forces can assist regulators in developing an efficient market mechanism to tackle climate change.

## **4 Insuring market participants against risk**

### *4.1 The various risk categories*

CDM market participants face high risks associated with project activities. There are two broad categories of risks.<sup>93</sup> First, *project risks* arise out of the physical activity supposed to reduce GHG emissions,<sup>94</sup> including aspects such as whether the project meets all the requirements of the CDM, whether the project will generate the CER estimated in the project document, and whether common construction risks exist.<sup>95</sup> Carbon credit projects are namely subject to normal risks, such as financing, construction and commissioning risks.<sup>96</sup> Second, *regulatory risks* include the uncertainty relating to the registration and issuance process as well as relating to the future prospects of the Kyoto Protocol.<sup>97</sup> Issuance risk is for instance a typical risk causing concerns to CER buyers.

The most important sources of risks lie within the primary CDM market. In principle, the buyers face several risks to non-delivery, including possible project rejection by the Executive Board,

operational problems with a CDM project, natural disaster, insolvency and political risks.<sup>98</sup> The buyers are concerned with the problem that project activities may deliver less credit than was targeted. This specific risk is significant in practice as such a situation is likely to occur in a number of cases.

#### 4.2 Risk management and risk allocation

The financial services industry can be involved in helping the contracting parties to manage their risks. They especially support the parties in structuring their contract in view of risk allocation. This can enable the parties to a CDM agreement to transact where the buyer or the seller is not willing to take certain specific risks. Moreover, the insurance sector is in charge of *insuring parties against damages resulting from the realisation of certain risks*. The contracting parties can thus benefit from the opportunity of shifting specific risks to a third party. As a consequence, transactions may occur more easily and market activity can be enhanced in the CDM market.

Broadly speaking, carbon contracts need to record the agreement between the parties, allocate risks, establish rights and create clear and enforceable obligations. The allocation of CDM risks between the buyer and the seller is indeed a primary objective of the ERPA, *defining the relationship between counterparties* in a market characterised by a wide variety of uncertainties and risks.

In a forward contract, the buyer eventually takes high risks. Not many transactions are likely to happen if the seller does not agree to concede certain rights to the buyer. In fact, many ERPA under which projects developers sell their CER include *delivery guarantees, penalties and strict enforcement clauses*.<sup>99</sup> From the buyer's perspective, the advantage of CER traded on the spot market is that they are considered as free from all project and regulatory risks. However, to await CER issuance and to close a sale on the spot market is risky for the seller because of the high volatility of the CDM market. Spot contracts are advantageous for the seller if CER prices tend to rise. Through spot contracts, the seller can take advantage of increases in CER prices. Nevertheless, in case of a decrease in CER prices, the seller who awaited CER issuance to conclude a spot contract bears the loss. In sum, contracting issues are challenging in the CDM market since sellers and buyers have different preferences which need to be adjusted. Financial intermediaries are in the best position to reconcile these diverging interests.

A further example is provided by the *secondary market for guaranteed CER (gCER)*, which has recently grown. A secondary seller – such as a market aggregator or a bank – sells gCER contracts which are typically secured through a slice of its carbon portfolios; this segment can play a determinant role when doubts about timely delivery of issued CER volumes boost demand and liquidity for exchange-traded contracts of the gCER as buyers seek compliance security.<sup>100</sup>

#### 4.3 The need for an increased role of the insurance sector in the CDM market

The financial services industry has already started to launch *insurance instruments* in order to provide direct insurance capacity to the carbon market. Basically, the contract terms need to clearly specify the risks covered by the target insurance products. In the first years of the CDM market, insurance companies ought to prudently engage in assessing risks due to a lack of historic track record. As the CDM market has been maturing, insurance companies may be able to enter into the business as key actors managing the high risks related to CDM project activities. Swiss Re launched the first insurance product for managing Kyoto-related risk in 2006; RNK Capital LLC, a New York-based private investment firm specialising in the American and international environmental markets, was provided coverage for the risks related to the CDM project registration and the CER issuance.<sup>101</sup> Further, an insurance policy has been created by Munich Re and named the Kyoto Multi Risk Policy.<sup>102</sup> Last but not least, Carbon Re is the first insurance service provider specialised solely in the carbon market. Concerning the CDM market, Carbon Re offers a Carbon Delivery Risk Assessment as well as a Carbon

Delivery Guarantee Insurance.<sup>103</sup> Therefore, supply exists and risk management tools have already been developed by insurance companies.

However, insurance instruments have hitherto not had much success since market participants have shown little interest in buying the offered products. Traders which buy in the primary market and send the issued CER in the secondary market do not like insurance products due to the fact that they would reduce their profit margin.<sup>104</sup> *Traders may therefore consider insurance products as too expensive.*<sup>105</sup> Nevertheless, compliance buyers do not have the same kinds of concerns. *Compliance buyers have an interest in being insured against CDM risks.* Logically, project developers and buyers would consider insurance products if the price is less than the spread between primary and secondary CER.<sup>106</sup> In this regard, it is likely that insurance companies are able to sell insurance products at acceptable and fair prices. For instance, specialised intermediaries can intervene in the business of guaranteeing CER delivery, which is highly valuable for risk-averse investors.

CDM project developers, investors and end buyers must be aware that sound risk management practices consist in more than in solely using carbon derivatives to hedge against price falls. Obviously, *derivatives and innovative financial products* play a significant role in enhancing market liquidity and stabilising the young carbon market. However, market participants cannot content themselves with carbon derivatives if they need a more comprehensible insurance against the high CDM risks. Project developers do not only face CDM-related risks, but also common project risks which the insurance sector can assess in the most efficient way. Since the various categories of risks are well understood, broad risk management tools can be operational in the CDM market and should be used more extensively by market participants. The insurance industry is best able to apply core insurance principles to the carbon market and has already proved that it can offer the related insurance products. It is to hope that project developers, investors and end buyers will recognise the benefits of being insured prior to bearing unsustainable losses. Therefore, the insurance sector has a potential to grow in the CDM market insofar as market participants become conscious of the benefits they can get from being insured against CDM risks.

## **5 Pooling economic resources**

### *5.1 The leading market position of carbon funds*

Carbon funds are key market actors which have a leading position in the global carbon market. They deal with manifold investments brought to the carbon market, for instance by regrouping investors under the same roof. The establishment of carbon funds has given a tremendous boost to the development of the CDM market.<sup>107</sup> On the one hand, the completion of big CDM projects depends on the pooling of sufficient resources.<sup>108</sup> Funds can gather the *necessary quantity of economic resources* to support valuable CDM projects. On the other hand, raising large funds enables a single counterparty to substantially invest in small projects. This endeavour is beneficial to the CDM market due to the fact that high transaction costs related to CDM project certification would otherwise make small projects financially unviable despite their value in combating the growth of GHG emissions.<sup>109</sup>

The *Prototype Carbon Fund (PCF)* of the World Bank has played a pioneer role in carbon finance while beginning carbon purchases in the year 2000. The PCF collects contributions from participating entities, uses them to facilitate projects reducing GHG emissions and distributes the generated emission reductions to the contributing entities pro rata based on the amount of their respective contributions.<sup>110</sup> Within the PCF, market participants are given a valuable example of structuring CDM transactions. The PCF is indeed considered as a trail blazer for other similar funds that might be launched by the other international financial institutions or the private sector.<sup>111</sup>

There are carbon funds which are very close to governments. In fact, the majority of the carbon funds currently operating are *public-private partnerships*, modelled according to the World Bank's PCF;

they are open to investment from both governments and private sector entities and are managed by a multilateral agency, government instrumentality or a private sector entity.<sup>112</sup> For instance, the *Climate Cent Foundation*<sup>113</sup> is reckoned a voluntary measure of the Swiss industry. Funding is provided by a charge levied on all imports of petrol and diesel. This climate protection fund purchases carbon certificates and transfers them to the Swiss government in order to reach Kyoto compliance. The bulk of the acquired certificates are generated through the CDM. For this purpose, the Climate Cent Foundation transacts with other climate protection funds, brokers (e.g., CantorCO2), traders (e.g., EcoSecurities), or contracts directly with project developers in developing countries.<sup>114</sup> Another example is the *Chinese CDM Fund*, which is fully managed by the Chinese government. In China, the right to the income obtained from the transfer of CER is to be shared between the government and the enterprise implementing the CDM project.<sup>115</sup> China imposes a 2% to 65% levy on CDM revenues.<sup>116</sup> Collected levies are transferred to the CDM Fund, thereby securing a source of funding for sustainable development activities and projects.<sup>117</sup>

### 5.2 Shortcomings in lending and borrowing

So far, commercial banks have not been engaged in the business of lending money to project developers and only a very little share of CDM projects is debt-financed. At the moment, this situation may partly have to do with the financial crisis due to the fact that banks are too risk-averse to provide the funds the CDM market needs. In a structural perspective, it is worth mentioning that typical local banks in the developing countries lack expertise and are unfamiliar with CDM projects, thereby driving up the cost of capital.<sup>118</sup> Commercial banks cannot invest in a risky business which they do not fully understand. Furthermore, project developers have not managed their risks in a satisfactory way. If they were more interested in purchasing insurance products, banks could most likely be in a position to lend money at an appropriate cost. The greater the risk involved in purchasing credits, the lower the price that a purchaser will be willing to pay.<sup>119</sup> Similarly, the greater the risk involved in lending, the less likely the borrowing opportunities that a commercial bank can offer. Therefore, it is regrettable that the *core principles related to traditional banking and insurance activities have not yet taken up successfully in the CDM market*. Project developers can barely negotiate upfront payments helping them to finance their CDM project. This may unfortunately crowd out some additional projects which would benefit from funding but cannot be developed without capital arising out of the CDM. Finally, a deeper involvement of the banking and insurance sectors in the CDM would ensure the growth of project activities through more secure channels treating investment with professional care.

Through lending and borrowing, the banking sector could play an increased role in *transferring resources across time and space* as well as in monitoring project developers. In the primary CDM market, timing is a decisive issue. Although the delivery of CER will only happen after the completion of a long process, funding can be needed in order to realise the CDM project. Further, the geographic component plays an important role since the cash flows are transferred from industrialised to developing economies. Difficulties can arise if counterparties do not know each other. Therefore, local banks should increasingly be involved in working closely with project developers in the developing world. If they get technical knowhow, their specific knowledge would enable them to choose CDM projects of high quality. Further, the *screening of project developers* requires specific skills. The financial activities involved especially with the primary market are demanding due to the difficulties arising from the CDM project pipeline, that is the registration and issuance process. Specialised financial intermediaries are well-placed to select projects of high quality since they may be able to come in close proximity to the project developers. Last but not least, banks may *monitor the project developers* in an adequate way. Financial intermediaries may exert their activity all along the CDM project cycle. Ongoing monitoring of project developers could therefore play a crucial role in the primary market since financial intermediaries such as commercial banks – as compared to the end

buyers of carbon certificates – may be able to have a closer contact with the project developers. Commercial banks' intervention in the CDM market would therefore be beneficial in terms of timing and geographic issues as well as in terms of screening and monitoring project developers. In particular, local banks would most definitely be better than traders at looking at the reality in the developing world.

## **6 Future roles of the financial services industry**

In the aftermath of the lack of a successful negotiations' conclusion at the Copenhagen Summit, this paper has illustrated how the financial services industry can perform crucial functions in the CDM market, especially when regulatory uncertainty adversely affects the whole carbon market. Interactions between the private and the public sectors are at any rate necessary to accomplish the difficult task of tackling climate change. Whereas the public sector must provide an adequate regulatory framework and supervision of the CDM market, the private sector can facilitate carbon exchanges and, therefore, contributes to the success of the market mechanisms. The integration of efforts made by private sector institutions such as financial intermediaries in the carbon market architecture is essential. Emission trading seems to be a very promising and lucrative services sector and deserves particular attention. Currently, the main challenges are to create a supply and demand for market liquidity as well as to remove uncertainties about the likely value of the carbon certificates in the future.<sup>120</sup> On the one hand, regulators of the carbon markets primarily carry responsibility for reducing uncertainties relating to the future of the CDM market. For the time being, the Copenhagen Summit has exacerbated the doubts regarding the future prospects of the global carbon market and regulatory risks have increased significantly, which calls for a *greater influence of the financial services industry in the carbon market*. The situation should stabilise in the long term, for instance if countries conclude a binding agreement at the next climate change summit in Cancun. On the other hand, financial intermediaries should be able to ensure a smooth transition when the regulatory regime evolves and can help market participants adapt to a changing regulatory environment. Their role will most likely increase in the future in order to keep pace with further developments in the carbon market. Regulators should in turn be aware of the tremendous growth of the private sector in the carbon market and exert oversight on market participants' trading activities.

Post-credit crunch worries about market failures and excessive speculation should not be considered to obscure the benefits that the financial sector can bring to the carbon market.<sup>121</sup> Innovative financial products can help make the carbon market more liquid, efficient and less volatile. Carbon funds and brokers have a role to play in this regard. This trend has allowed the CDM market to grow at an extraordinary pace. Brokers, investment funds and traders believe that they can execute the business without the help of banks and insurance companies because they are not willing to share their profits. However, the rapid growth of the market mechanisms and the pursuit of quick profits will not help the CDM market to reach maturity. This growth is not sustainable if market participants do not invest their money according to *basic rules of due diligence*. Core principles of banking and insurance practices should find a greater place in the CDM market. Obviously, focus needs to be put on more traditional banking and insurance practices. Only rigorous market analysis and risk management practices can make the business more secure. A prudent growth is required so that the market has the time to learn lessons from its records. Further, investors are key actors whose needs direct the carbon market. If investors want security, they can orientate the financial intermediaries, which will adapt to their needs. Institutional investors such as pension funds and insurance companies could have a positive influence on the business. Market growth must be based on long-term strategies and strong technical skills of its market participants.

In a nutshell, *professionalism* is the key to success in the carbon market. If carbon firms build large portfolios without sufficiently strong balance sheets or risk management expertise, this endeavour could lead to excesses and market instability.<sup>122</sup> Therefore, even if regulators have to recognise the benefits brought by financial innovation to the CDM market, yet they must keep an overview on the market activities of financial intermediaries since an unsupervised growth of a new market segment entail effective dangers.

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