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Darbellay, Aline; Weber, Rolf

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# Regulation and Financial Intermediation in the Kyoto Protocol's Clean Development Mechanism

ROLF H. WEBER\* AND ALINE DARBELLAY\*\*

*This article highlights the role that regulators and financial intermediaries play in the proper functioning of the Clean Development Mechanism (CDM). Created by the Kyoto Protocol (Protocol), the CDM enables industrialized countries to meet the Protocol's emission reduction targets while financing environmental projects in developing countries. Issues related to the CDM are globally important because this market mechanism is widely used in both the compliance-driven carbon market as well as the voluntary carbon market. Accordingly, regulatory intervention must address the interests of the various market participants. Regulators should pay attention to both the primary and secondary CDM markets. Moreover, financial intermediaries are also involved in both markets. Financial intermediaries facilitate the exchange of carbon certificates, by bringing project developers together with the ultimate buyers of CDM certificates. Broadly speaking, the CDM market is considered a successful example of the public sector working with the private sector to address climate change.*

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\* Rolf H. Weber is an Ordinary Professor for Civil, Commercial and European Law at the University of Zurich and Visiting Professor at the University of Hong Kong. He is head of the project "Law, Regulation and Finance," which is one specific topic of the research program "Finance and Financial Markets" at the University of Zurich. He is the Director of the European Law Institute and the Center for Information and Communication Law at the University of Zurich. Additionally, he is engaged as an attorney-at-law and as a Member of the Editorial Board of several Swiss and international legal periodicals.

\*\* Aline Darbellay is a research assistant at the University of Zurich. She has been active in the "Law, Regulation and Finance" topic of the research program "Finance and Financial Market." She is currently working on projects in financial market regulation. She holds a Master of Law from the University of Lausanne. © 2010, Rolf H. Weber and Aline Darbellay.

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## 1 INTRODUCTION

The Kyoto Protocol ("Protocol") to the United Nations Framework Convention on Climate Change ("UNFCCC")<sup>1</sup> creates a market mechanism to address greenhouse gas ("GHG") emissions.<sup>2</sup> The market arising out of the UNFCCC framework – commonly referred to as the "carbon market" – was artificially created through regulatory intervention, as GHG emissions are not a scarce resource in nature.<sup>3</sup> The establishment of a regulated market precipitated the use of market mechanisms, such as the Protocol's Clean Development Mechanism ("CDM").<sup>4</sup> On one hand, the carbon market can only function properly if it is

1. All terms are explained in a glossary at the end of this article.

2. Kyoto Protocol to the United Nations Framework Convention on Climate Change, art. 6, Dec. 10, 1997, 37 I.L.M. 22, U.N. Doc. FCCC/CP/1997/7/Add.1 (entered into force Feb. 16, 2005), available at <http://unfccc.int/resource/ddoc/convkp/kpeng.pdf> [hereinafter Kyoto Protocol].

3. See Anne Petitpierre-Sauvain, *Les instruments économiques dans le protocole de Kyoto: l'instauration d'un marché des droits d'émission*, 87 DROIT DE L'ENVIRONNEMENT DANS LA PRATIQUE (SPECIAL ISSUE 1.2) 88, 92 (2007).

4. Sandra Greiner & Axel Michaelowa, *Defining Investment Additionality for CDM Projects – Practical Approaches*, 31 ENERGY POL'Y 1007, 1007 (2003).

adequately regulated. On the other hand, private industry plays a crucial role in carbon trading. This article provides an overview of the CDM market, highlighting both the relevant regulation and financial intermediation. The major program under the flexible mechanisms of the Kyoto Protocol consists of a cap-and-trade system that restricts the quantity of GHG emission certificates available to the market. Participating countries aim to reduce their own GHG emissions while also using tradable allowances to meet their compliance obligations.<sup>5</sup> In short, countries with a surplus of emission certificates sell them to countries that do not have enough emission certificates to meet their emissions.

Apart from the cap-and-trade system, GHG emission reductions can generate carbon credits under a project-based program.<sup>6</sup> Because not all countries are subject to binding GHG emission reductions under the Kyoto Protocol, the CDM enables regulated countries, or companies, to meet reduction targets by investing in unregulated countries and subsequently buying carbon credits generated by these countries' emission reductions.<sup>7</sup> The carbon credits that result from the CDM are called Certified Emission Reductions ("CER").<sup>8</sup> Having been operational for more than five years, the CDM is a global market mechanism with an innovative form of regulatory governance.<sup>9</sup> Developing countries benefit from new funding opportunities, and industrialized economies are able to meet their reduction targets at a lower cost. The CDM is based on the assumption that the location of GHG reductions is irrelevant. However, the fact that emission reductions arise in countries that have no emission targets to meet raises concerns about additionality, i.e., that overall GHG emissions need to be less than what would have occurred without the credit program.<sup>10</sup> This concept ensures that the CDM does not undermine the environmental integrity of the international climate change regime.

The CDM market has grown at an extraordinary pace over the past several years, with demand for CER coming mainly from private sector entities in the European Union, but also from European governments and Japan.<sup>11</sup> On the

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5. Christopher Carr & Flavia Rosembuj, *Flexible Mechanisms for Climate Change Compliance: Emission Offset Purchases under the Clean Development Mechanism*, 16 N.Y.U. ENVTL. L.J. 44, 44 (2008).

6. See, e.g., Joëlle de Sépibus, *The environmental integrity of the CDM mechanism – A legal analysis of its institutional and procedural shortcomings* 4 (NCCR Trade Regulation, Working Paper No. 2009/24, May 2009).

7. See Kyoto Protocol, *supra* note 2, art. 12; Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 297 (2008).

8. Axel Michaelowa & Frank Jotzo, *Transaction costs, institutional rigidities and the size of the clean development mechanism*, 33 ENERGY POL'Y 511, 511 (2005).

9. Axel Michaelowa & Benito Müller, *The Clean Development Mechanism in the Future Climate Change Regime*, CLIMATE STRATEGIES, May 31, 2009, at 3.

10. See Axel Michaelowa & Pallav Purohit, *Additionality Determination of Indian CDM Projects, Can Indian CDM Project Developers outwit the CDM Executive Board?*, CLIMATE STRATEGIES, Feb. 1, 2007, at 2; Greiner & Michaelowa, *supra* note 4, at 1007-08.

11. KARAN CAPOOR & PHILIPPE AMBROSI, THE WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET

supply side, China and India have been the world's largest sellers of CER; both governments regard the resulting inflow of foreign investment as a considerable advantage for their economies.<sup>12</sup> Last year, the CDM fostered clean energy investments in projects such as renewable energy, fuel switching, and energy efficiency.<sup>13</sup>

The UNFCCC has established a registration and issuance process for CER.<sup>14</sup> Many projects, however, have been blocked in the CDM project pipeline, making timely CER issuance difficult.<sup>15</sup> To some extent, the CDM market has become a victim of its own success. Consequently, large delays occur in the issuance of CER, and a high level of uncertainty exists with respect to the acquisition of CER.<sup>16</sup> Until 2008, regulators and financial institutions struggled to keep pace with the large CDM supply.<sup>17</sup>

However, the current financial crisis has affected the carbon market considerably.<sup>18</sup> Due to the economic recession, GHG emission reduction targets have become easier to meet, which, in turn, has diminished the demand for carbon credits.<sup>19</sup> In a worst-case scenario, the financial crisis could undermine the entire CDM market. In light of the financial crisis, some CDM buyers have delayed or cancelled carbon credit project investments; others are trying to get out of their contracts before they result in default, or in breach of contract.<sup>20</sup> A lower rate of general market activity harms the carbon market, which could eventually become illiquid.<sup>21</sup> In addition, if energy prices fall, companies are less willing to make efforts to reduce their GHG emissions; they may instead continue consuming energy because they can buy carbon credits at a discounted price. Therefore,

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2008 2 (2008).

12. KARAN CAPOOR & PHILIPPE AMBROSI, *THE WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET* 2007 24 (2007).

13. KARAN CAPOOR & PHILIPPE AMBROSI, *THE WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET* 2009 40 (2009).

14. United Nations Framework Convention on Climate Change [UNFCCC], *Report of the Conference of the Parties on its Seventh Session*, Marrakesh, Oct. 29-Nov. 10, 2001, Addendum, Annex: Modalities and procedures for a clean development mechanism, para. 5(m), Dec. 17/CP.7, para. 2, UN Doc. FCCC/CP/2001/13/Add.2 (Jan. 21, 2002) [hereinafter *Marrakesh Accords*] (the Marrakesh Accords supplemented the Kyoto Protocol and are crucial for the implementation of the CDM).

15. Martijn Wilder & Louisa Fitz-Gerald, *Clean Development Mechanism*, in *HANDBOOK OF TRANSNATIONAL ECONOMIC GOVERNANCE REGIMES* 817, 824 (Christian Tietje & Alan Brouder eds., Martinus Nijhoff Publishers 2009).

16. *See id.* at 824.

17. *See* CAPOOR & AMBROSI, *supra* note 11, at 21.

18. *See* CAPOOR & AMBROSI, *supra* note 13, at 31.

19. *See, e.g.*, Endre Tvinnereim, *Cloudy today, sunny next week*, *TRADING CARBON*, April 2009, at 18-19.

20. *See* Point Carbon, *CER buyers try to "wriggle free" from deals*, *CDM & JI MONITOR*, March 18, 2009, at 1 [hereinafter *CER buyers*].

21. *See* Point Carbon's Fifth Annual Conference, *Carbon Markets Insights 2009*, Copenhagen, Mar. 17-19, 2009, *Carbon 2009, Emission Trading Coming Home*, 12 (Endre Tvinnereim et al. eds., 2009) [hereinafter *Emission Trading*]; *see also* Point Carbon, *CDM Market Comment*, *CDM & JI Monitor*, Apr. 1, 2009, at 2 [hereinafter *CDM Market Comment*].

because it is now cheap to pollute, low CER prices in conjunction with low energy prices are problematic.

Market structures in the CDM are characterized by the distinct primary and secondary markets. The market for newly issued CER by the CDM Executive Board is commonly called the primary market.<sup>22</sup> The secondary market is the market where buyers and sellers come to exchange already issued carbon certificates.<sup>23</sup>

Because the carbon market is very young, it has been extremely volatile. Time and more certainty about its future prospects should lend it the credibility needed to achieve a certain degree of market stabilization. However, the divergent prices for CER in the primary and secondary CDM markets also give rise for concern. More transparency is required so that price mismatches exist only where higher risks are taken in the primary CDM market.

This article concentrates on the implementation of the CDM. It proceeds on the assumption that the proper functioning of the CDM market depends on the appropriateness of regulation and on the adequacy of functions executed by financial intermediaries. Regulators should be responsible for addressing the quantity and quality of CER available to the market. They must closely monitor the primary issuance of CER, as well as on the secondary exchange of CER. Financial intermediaries also play a role in the trading of carbon units, bringing together sellers and buyers of reduction certificates.<sup>24</sup>

## 2 THE REGULATION OF THE PRIMARY CDM MARKET

### 2.1 THE RATIONALE FOR THE CDM PROGRAM WITH RESPECT TO DEVELOPING COUNTRIES

Tackling global climate change requires the involvement of every country. Yet, it has proven difficult to get major developing countries to participate in an agreement on climate change.<sup>25</sup> Developing countries thus far have focused on building and strengthening their economies, and climate change commitments could preclude them from rapid economic growth. However, without the participation of developing countries, an agreement on climate change would be of limited use and could even be counterproductive.<sup>26</sup> The market mechanisms established by the Kyoto Protocol would completely fail if GHG emission

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22. See generally ANTHONY M. SANTOMERO & DAVID F. BABEL, *FINANCIAL MARKETS, INSTRUMENTS, AND INSTITUTIONS* 432 (2d ed., McGraw-Hill/Irwin 2001).

23. See generally David E. Ayling, *Secondary Markets*, in *INVESTMENT BANKING, THEORY AND PRACTICE* 87, (Edward P. M. Gardener & Philip Molyneux eds., 2d ed. 1999).

24. For instance, they are involved in brokerage, fundraising, and insurance activities.

25. Robert W. Hahn, *Climate Policy: Separating Fact from Fantasy*, 33 *HARV. ENVTL. L. REV.* 557, 564 (2009).

26. *Id.* at 564.

reductions in one part of the world caused GHG increases in another part of the world.<sup>27</sup> Instead of reducing their own emission reductions, countries participating in the agreement would either import pollution from non-participating countries or shift their investments to non-participating countries in order to benefit from no regulation. The CDM partly addresses this problem. One reason the CDM has been successful is because it encourages developing countries to participate in the international climate regime,<sup>28</sup> which the developing world has traditionally resisted. However, the CDM offers the opportunity for a slow transition toward the establishment of a cap-and-trade system in some developing countries, such as China or other large emitters.<sup>29</sup>

To satisfy the needs of both industrialized and developing countries, the CDM allows industrialized countries to finance carbon projects in developing countries that have not made commitments to reduce their GHG emissions.<sup>30</sup> On one hand, industrialized economies can fund environment-friendly projects in an effort to receive carbon credits, thus allowing them to meet their reduction targets at a lower cost.<sup>31</sup> On the other hand, the CDM enables developing countries to support their economies in a sustainable way because of the funding of industrialized countries. The CDM is considered the best means to direct developing countries towards emission reduction strategies and to promote sustainable development.<sup>32</sup> For developing countries specifically, the CDM is an opportunity to ensure long-term, sustainable and equitable development.<sup>33</sup> Further, because companies can develop technology and export it to a developing country, the CDM incentivizes the transfer of clean technologies.<sup>34</sup> Thus, 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 to reduce GHG emissions at a lower cost.<sup>35</sup>

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27. See Alfred Endres & Cornelia Ohl, *Kyoto, Europe? – An Economic Evaluation of the European Emission Trading Directive*, 19 EUR. J. OF L. AND ECON. 17, 22 (2005).

28. Craig Hart et al., *East Asia Clean Development Mechanism: Engaging East Asian Countries in Sustainable Development and Climate Regulation through the CDM*, 20 GEO. INT'L ENVTL. L. REV. 645, 678 (2008).

29. *Cf. id.* at 652–53.

30. Carr & Rosembuj, *supra* note 5, at 47.

31. See Andreas Tuerk et al., *The role of land-based offsets in Emissions Trading Systems: Key design aspects and considerations for linking 1* (Climate Strategies, Working Paper Linking -2, Aug. 2008).

32. John Humphrey, *The Clean Development Mechanism: How to Increase Benefits for Developing Countries*, 35 IDS BULLETIN 84, 84 (2004).

33. Youba Sokona & Djimingué Nanasta, *The Clean Development Mechanism: An African Delusion?*, CHANGE: RES. AND POL'Y NEWSL. ON GLOBAL CHANGE FROM THE NETH., Oct.–Nov. 2000, at 8

34. Munich Re Group, *Cycle Management, Climate Neutrality, Kyoto Multi Risk Policy*, TOPICS, Issue 2, 2007, at 35.

35. See Andrew Schatz, *Discounting the Clean Development Mechanism*, 20 GEO. INT'L ENVTL. L. REV. 703, 717 (2008). In short, the ideas underlying the CDM are cost-effectiveness and irrelevance of the GHG emissions' location.

Nevertheless, attention also needs to be paid to the regulatory process linked to the creation of a carbon market. Because carbon emissions can be unlimited in the atmosphere, the establishment of a kind of artificial scarcity is a prerequisite for the creation of a carbon market.<sup>36</sup> Therefore, regulation or other policies are necessary to confer an economic value on carbon certificates.

So far, regulatory activity has concentrated on the primary CDM market, i.e., the market for original CER issuance.<sup>37</sup> The UNFCCC frameworks established governance structures to ensure the environmental integrity of the quantity and quality of CER issued. For instance, regulatory mechanisms have been designed to ensure that projects result in GHG emissions below those that would have occurred otherwise.<sup>38</sup> In this regard, the proper functioning of the CDM market calls for adequate regulation. However, because market mechanisms are used, the created market also must function in a competitive manner.<sup>39</sup> The efficient allocation of resources in the CDM market thus can only occur if market participants are driven by competitive pressure and if regulations do not privilege any market participants to the detriment of others. Regulatory intervention has some drawbacks, as it may erect barriers to entering the CDM market. Consequently, the process of issuing CER must be examined carefully in view of the need to balance divergent interests. Only in this way may regulators determine the optimal amount of regulation.

## 2.2 THE REGISTRATION AND ISSUANCE PROCESS

The CDM Executive Board regulates and supervises CDM project activities.<sup>40</sup> CDM projects must proceed through the CDM project pipeline before they can begin to generate carbon credits.<sup>41</sup> The majority of the steps through the pipeline are controlled by private sector actors who make decisions unless the Executive Board objects.<sup>42</sup> Because of this lengthy process, CDM projects often are delayed in the pipeline. At the end of September 2009, more than 4,600 projects were in the CDM project cycle, of which roughly one-third were registered, while roughly two-thirds were at the validation stage.<sup>43</sup> For regulatory purposes, it is

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36. Petitpierre-Sauvain, *supra* note 3, at 92.

37. See generally SØREN ENDER LUTKEN & AXEL MICHAELOWA, CORPORATE STRATEGIES AND THE CLEAN DEVELOPMENT MECHANISM: DEVELOPING COUNTRY FINANCING FOR DEVELOPED COUNTRY COMMITMENTS? 21-26 (EDWARD ELGAR PUBLISHING LTD., 2008).

38. Humphrey, *supra* note 32, at 85.

39. Friedrich Schneider & Alexander F. Wagner, *Tradable Permits – Ten Key Design Issues*, CESIFO FORUM, Issue 1, 2003, at 18.

40. Michaelowa & Müller, *supra* note 9, at 3.

41. See LUTKEN & MICHAELOWA, *supra* note 37, at 23-26.

42. Maria Netto & Kai-Uwe Barani Schmidt, *CDM Project Cycle and the Role of the UNFCCC Secretariat*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 175, 183 (David Freestone & Charlotte Streck eds., Oxford University Press 2005).

43. See UNEP Risoe Centre, CDM/JI Pipeline Overview, <http://cdmpipeline.org/overview.htm> (last visited



important to establish clear and efficient criteria in the primary CDM market – the market for CER issuance – to monitor the issuance of CER.

*i. Project Approval by the Host Country and the Home Country*

The first phase of the pipeline is the approval of the CDM Project. Each country participating in CDM projects accredits a Designated National Authority (“DNA”), which is responsible at a national level for granting approvals to CDM projects that fulfil national criteria for sustainable development.<sup>44</sup> Buyers will require project approval from the DNA of the home country, i.e. the country having emission reduction targets, and sellers will require approval from the DNA of the host country, i.e. the developing country hosting the CDM project.<sup>45</sup>

*ii. Project Validation by a Designated Operational Entity*

At the validation stage, a Designated Operational Entity (“DOE”) conducts an independent evaluation of the CDM project.<sup>46</sup> The CDM Executive Board accredits companies that are either a domestic legal entity or an international organization.<sup>47</sup> The first DOE (“DOE1”) must validate and subsequently request registration of a proposed CDM project activity, using an approved methodology.<sup>48</sup> Eventually, the DOE1 submits a validation report to the CDM Executive Board, thereby confirming that certain preset requirements are met.<sup>49</sup>

*iii. Project Registration with the CDM Executive Board*

A validated project becomes a CDM project activity when it is registered, which is the formal acceptance by the CDM Executive Board of a validated project.<sup>50</sup> The CDM Executive Board must register CDM projects within eight weeks of the DOE1’s request unless three members of the CDM Executive Board, or a CDM participant, require a review of the proposed project activity.<sup>51</sup> If the CDM Executive Board does not object to the DOE1’s request, the DOE1 effectively has made the decision.<sup>52</sup>

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Jan. 18, 2010).

44. ANDREAS ZUMBACH, *TRADING CERTIFIED EMISSION REDUCTIONS, LEGAL ASPECTS FROM A EUROPEAN AND SWISS PERSPECTIVE* 19 (VDM Verlag Dr. Müller 2008).

45. *Id.* at 19-20.

46. Marrakesh Accords, *supra* note 14, Annex: Modalities and procedures for a clean development mechanism, para. 27(a).

47. *Id.* App. A, para. 1(a).

48. Netto & Barani Schmidt, *supra* note 42, at 180.

49. Marrakesh Accords, *supra* note 14, Annex: Modalities and procedures for a clean development mechanism, para. 40(f).

50. *Id.* para. 36.

51. *Id.* para. 41.

52. *See, e.g.*, ZUMBACH, *supra* note 44, at 25.

*iv. Project Verification by a Second Designated Operational Entity*

At this stage, the project participants implement the CDM project activity.<sup>53</sup> A second DOE (“DOE2”) monitors the CDM project performance, thereby verifying and certifying the emission reductions of a registered CDM project activity.<sup>54</sup> The main function of the DOE2 is to monitor whether CDM projects result in emissions reductions that are in line with what was promised.<sup>55</sup> Concrete measurement of emission reductions may be very challenging. Like the DOE1, the DOE2 is accredited by the CDM Executive Board.<sup>56</sup> The DOE1 and the DOE2 responsible for a specific case must be different entities to guarantee the independence of the judgments; however, the fact that both DOEs are paid by project proponents may jeopardize their neutrality.<sup>57</sup> If the DOE2 opts to certify the emission reductions as appropriate, it will request the Executive Board to issue CER.<sup>58</sup>

*v. Issuance of CER by the CDM Executive Board*

Within fifteen days of the DOE2’s request for issuance of CER, three members of the CDM Executive Board, or a CDM participant, can require a review of the DOE2’s recommendation.<sup>59</sup> Because the scope of the review is limited to issues of fraud, malfeasance, or incompetence of the DOE2, issuance of CER by the Executive Board is similar to the registration phase: it is almost an automatic step.<sup>60</sup> If the CDM Executive Board or a CDM participant does not ask for a review, the issuance is considered final, and the CDM registry administrator issues the CER.<sup>61</sup> Therefore, unless a request for review is triggered, the decision-making power essentially rests with the DOE2.

One CER represents one ton of carbon dioxide equivalent, i.e. a carbon unit.<sup>62</sup> No tangible certificate is created upon issuance, but an electronic database tracks the output of CER.<sup>63</sup> Carbon units are accounting units that have their own unique serial numbers and are tracked and recorded through the CDM registry or

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53. UNEP, THE UNEP PROJECT CD4CDM, CDM PDD GUIDEBOOK: NAVIGATING THE PITFALLS 8, 16 (Sami Kamel ed., UNEP 2008).

54. See Marrakesh Accords, *supra* note 14, Annex: Modalities and procedures for a clean development mechanism, para. 27(b).

55. See LÜTKEN & MICHAELOWA, *supra* note 37, at 24.

56. Marrakesh Accords, *supra* note 14, Annex: Modalities and Procedures for a clean development mechanism, para. 5 (f), para. 20(a).

57. See De Sépibus, *supra* note 6, at 14-15.

58. Netto & Barani Schmidt, *supra* note 42, at 180.

59. Marrakesh Accords, *supra* note 14, Annex: Modalities and procedures for a clean development mechanism, para. 65.

60. Netto & Barani Schmidt, *supra* note 42, at 189.

61. See, e.g., ZUMBACH, *supra* note 44, at 27.

62. See, e.g., De Sépibus, *supra* note 6, at 5.

63. ZUMBACH, *supra* note 44, at 29.

any subsequent national registry.<sup>64</sup> CER are transferable and can be traded in the carbon market.<sup>65</sup>

## 2.3 KEY REGULATORY ISSUES

### 2.3.1 Regulatory Risks and High Transaction Costs

The use of market mechanisms precipitates the need for a competitive environment because competition is a key prerequisite for adequate price discovery mechanisms. A market works most efficiently if price discovery mechanisms are well designed, such that they determine the fair price for carbon certificates. Price is determined through the interplay of supply and demand and results from market forces. However, the governance structures established by the Kyoto Protocol create a high regulatory barrier to entering the CDM market. For instance, the CDM project pipeline contributes to procedural inefficiencies, such as uncertainty with respect to the completion of projects and delays in CER issuance.

Obtaining timely CER issuance proved to be quite challenging in 2007; market participants and institutions, as well as regulators, were struggling to keep up with CDM supply.<sup>66</sup> Regulators endeavored to address an ever-growing number of proposed CDM projects on an extremely limited budget.<sup>67</sup> CER was in abundant supply because project developers had great expectations about the financing opportunities provided by CDM project activities; as a consequence, too many projects were proposed, blocking the project pipeline and increasing supply.<sup>68</sup>

Regulatory risks also pose problems for CDM projects. Primary project developers face delays in financing and implementing projects because of the blocked CDM project pipeline, which in turn dampens enthusiasm for further innovation.<sup>69</sup> Notwithstanding a worthy project, developers may even be dissuaded from registering for and requesting CER to be issued because of the rigorous CDM process. Eventually, buyers will prefer other means to meet their reduction targets, even though they may face higher prices. For example, the price difference between CER and European Union Allowances ("EUA") is partly because the CER registration and issuance process, which creates more delivery risk for CER than for EUA.<sup>70</sup> EUA are the carbon certificates arising out

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64. Matthieu Wemaëre, *Legal Nature of Kyoto Units*, in *THE KYOTO PROTOCOL AND BEYOND, LEGAL AND POLICY CHALLENGES OF CLIMATE CHANGE* 71, 72 (W.Th. Douma et al., eds., 2007).

65. Hart et al., *supra* note 28, at 646-47.

66. See CAPOOR & AMBROSI, *supra* note 11, at 21.

67. Wilder & Fitz-Gerald, *supra* note 15, at 824.

68. See CAPOOR & AMBROSI, *supra* note 11, at 4.

69. *Id.* at 4-5.

70. Rolf H. Weber, *Emissions Trading*, in *UNTERNEHMEN – TRANSAKTION – RECHT: LIBER AMICORUM FÜR ROLF WATTER ZUM 50. GEBURTSTAG* 475, 488 (Nedim P. Vogt et al. eds., Dike Verlag AG 2008); Brett Orlando et

of the European Emission Trading Scheme (EU ETS).<sup>71</sup> In addition, project-based credits such as CER are necessarily created through a process involving significant transaction costs.<sup>72</sup> These costs further exacerbate the barriers to entry.

Another problem is that the regulatory process may not lead to selection of the best CDM projects. Indeed, projects that really need the carbon payments to overcome hurdles are more likely to fail as a result of regulatory delays than are projects that are not as reliant on carbon payments for their construction and implementation.<sup>73</sup>

### 2.3.2 The Additionality Requirement

The term “additionality” has its base in the UNFCCC frameworks, which state that GHG emission reductions shall be additional to those that would have occurred in the absence of the certified project activity.<sup>74</sup> Thus, GHG emission reductions are considered additional if they would not have occurred in the absence of the CDM program.<sup>75</sup> In other words, a credit is environmentally additional if the produced outcomes would not have occurred under a business-as-usual scenario.<sup>76</sup> Because the CDM program strives to reduce emissions on a global scale, the environmental integrity of the CDM is only preserved if CER are given exclusively to projects that would not have been developed but-for the CDM.<sup>77</sup> Therefore, a CDM project must pass the additionality test (i.e., regulators must determine whether emission reductions will be more than those that would have occurred in the absence of the project) before being accepted.<sup>78</sup>

Although additionality seems to be an adequate criterion that provides credibility to the project-based system, concerns have been raised about the difficulties of enforcing this requirement in practice. First and foremost, CDM actors are confronted with a measurement problem. A credit-based program encourages emission reductions through activities outside the scope of a cap-and-trade system; however, the estimation of emission reductions poses practical problems

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al., *CO<sub>2</sub> Emissions Trading*, in *STROMHANDEL* 65, 72 (Rolf H. Weber ed., Schulthess 2007).

71. One EUA is equivalent to one ton of carbon dioxide. See, e.g., Joëlle de Sépibus, *Scarcity and Allocation of Allowances in the EU Emissions Trading Scheme – A Legal Analysis 2* (NCCR Trade Regulation, Working Paper No. 2007/32, 2007).

72. CAPOOR & AMBROSI, *supra* note 12, at 8.

73. CAPOOR & AMBROSI, *supra* note 11, at 5.

74. Kyoto Protocol, *supra* note 2, art. 12, para. 5(c); e.g., Michael Dutschke & Axel Michaelowa, *Development Assistance and the CDM – How to Interpret “Financial Additionality”*, 11 *ENV'T & DEV. ECON.* 235, 235 (2006).

75. Marrakesh Accords, *supra* note 14, Annex, para. 43.

76. Jillian Button, *Carbon: Commodity or Currency? The Case for an International Carbon Market Based on the Currency Model*, 32 *HARV. ENVTL. L. REV.* 571, 584 (2008).

77. See Greiner & Michaelowa, *supra* note 4, at 1007.

78. Michaelowa & Purohit, *supra* note 10, at 2.

because unlike emissions themselves, emission reductions cannot be directly measured.<sup>79</sup> Therefore, it is challenging to quantitatively prove that emissions have been reduced beyond a business-as-usual scenario. An appropriate additionality test implies that non-additional projects should not be competitive with additional projects. Business-as-usual projects do not deserve to be treated similarly to projects that achieve GHG emission reductions. Consequently, the additionality requirement reduces the probability that worthy projects will be crowded out due to the presence of business-as-usual projects. Although it is difficult to determine whether a project results in emission reductions beyond the status quo, the additionality requirement attempts to safeguard the environmental integrity of the Kyoto Protocol.<sup>80</sup> Ultimately, everything depends on the design of an adequate scheme that establishes a conservative and universal definition of the additionality concept.<sup>81</sup> It is worth noting that without international investors buying emissions credits, additional CDM projects would generally not be financially viable.<sup>82</sup> However, the regulatory barrier to entering the CDM market works against the goal of additionality. Indeed, fulfilment of the additionality requirement is jeopardized by regulatory barriers that may preclude worthy projects from entering the CDM market. The CDM project pipeline has counterproductive effects because it does not provide for selection of the most meritorious projects; only projects that do not rely on CDM funding can survive the pipeline's uncertainty and delay. For instance, transaction costs involved in developing new projects are so high that it only becomes practical to incur the extra costs if much of the work for the project would have been performed anyway.<sup>83</sup> Delays in CDM payments further exacerbate this systematic bias in favor of those projects that may be self-financed by large, wealthy project developers.<sup>84</sup> Developers with meritorious projects might nevertheless renounce CDM projects because of the regulatory barriers.

### 2.3.3 The Supplimentarity Debate

'Supplimentarity' raises the question as to what share of emission commitments industrialized countries should undertake within their own territories and what share they should undertake in developing countries.<sup>85</sup> Most countries prioritize domestic action because the cap-and-trade system requires participat-

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79. Stavins, *supra* note 7, at 297; see De S epibus, *supra* note 6, at 6.

80. Greiner & Michaelowa, *supra* note 4, at 1009-10.

81. *Id.* at 1010.

82. See Button, *supra* note 76, at 584.

83. Humphrey, *supra* note 32, at 87.

84. See CAPOOR & AMBROSI, *supra* note 11, at 5.

85. Ian Rowlands, *The Kyoto Protocol's "Clean Development Mechanism": A Sustainability Assessment*, 22 *THIRD WORLD Q.* 795, 801 (2001). There is a debate as to what share of industrialized countries' commitments must be satisfied by reductions from within their own territories and what share could be undertaken in developing countries. Rowlands, *supra* note 85, at 801.

ing countries to try to reduce their own GHG emissions.<sup>86</sup> Internally reduction of emissions, as opposed to buying external credits to reduce emissions, is critical to preserving the environmental integrity of the international climate regime. The supplementarity requirement mandates that internal abatement of GHG emissions must prevail over external participation in the Protocol's flexible mechanisms, such as the CDM. Therefore, supplementarity precludes countries and companies from counting on the CDM to bypass their reduction targets.<sup>87</sup> Restrictions on the use of the CDM are thus necessary to ensure that industrialized countries do not use external offsets to satisfy the majority of their reduction targets.<sup>88</sup>

Supplementarity introduces caps on the CDM demand side.<sup>89</sup> Countries having emission reduction targets may only buy a limited amount of CER, which reduces the CER demand. To some extent, limiting the demand for CER makes price discovery mechanisms in the CDM market less efficient, meaning that market may not produce fair CER prices. CER prices cannot fully reflect the market conditions if the demand side is capped. Establishing a supplementarity requirement can be very counterproductive if demand caps result in CER prices remaining artificially low; instead, it is better for CER to remain fully competitive with other carbon credits. Further, governments with reduction targets should not adopt protectionist measures to privilege their own carbon certificates.

#### 2.3.4 The Cap on the Supply Side

Caps on the supply side have a different meaning than caps on the demand side. Carbon units have economic value because of their artificial scarcity. The available quantity of emission certificates plays a central role in the proper functioning of the carbon market. Restrictions on CDM project activities also guarantee a certain standard of quality.<sup>90</sup> In this sense, eligible CDM projects are limited, and the primary CDM market – the market for CER issuance – is highly regulated. Restrictions are distinct depending on the type of CDM project. For instance, concerning afforestation, developers of forestry projects may only apply for CDM credits once every five years.<sup>91</sup>

The supply of carbon credits depends on the quantity of CER issued by the

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86. Michael Grubb, *On Carbon Prices and Volumes in the Evolving "Kyoto Market"*, at 9, CCNM/GF/SD/ENV (2003) 12/FINAL (prepared for OECD Global Forum on Sustainable Development: Emissions Trading, Paris, Mar. 17-18, 2003).

87. Kyoto Protocol, *supra* note 2, art. 6, para. 1(d), art. 12, para. 3(b), art. 17; see Erich Vranes, *Climate Change and the WTO: EU Emission Trading and the WTO Disciplines on Trade in Goods, Services and Investment Protection*, 43 JOURNAL OF WORLD TRADE 707, 710 (2009).

88. Robert Hamwey & Francisco Szekely, *Practical Approaches in the Energy Sector*, in ISSUES & OPTIONS, THE CLEAN DEVELOPMENT MECHANISM 119, 122 (José Goldemberg ed., UNDP 1998).

89. *Id.*

90. See, e.g., Vranes, *supra* note 87, at 713-14.

91. Point Carbon, *EB registers second afforestation project*, CDM & JI MONITOR, Apr. 1, 2009, at 6.

CDM Executive Board; new CER issuances are limited because they only arise once a project successfully navigates the project pipeline.<sup>92</sup> In practice, the CDM Executive Board has little flexibility when it comes to the quantity of CDM to be issued. The Board's primary mechanism to alter the quantity of CER is to appoint a greater number of DOE.<sup>93</sup> The more DOE, the more CDM projects that can be validated and verified, thereby implying that the CDM Executive Board will issue more CER.<sup>94</sup>

At the beginning of 2009, concerns were expressed about the continuous inflow of project activities that could result in excess supply.<sup>95</sup> If the number of CDM project activities continues to grow, further attention must be given to the optimal quantity of CER to be issued for the primary CDM market or, alternatively, to retiring a certain amount of CER. If CER prices crash due to an excessive supply, it will be detrimental to the proper functioning of the CDM program. Although demand for carbon credits may vary significantly depending on market conditions, the particularities of the carbon market make it such that the supply of carbon credits is fixed over a long period of time.<sup>96</sup> From an environmental perspective, the more CER that are issued, the greater are the efforts made to tackle climate change. Therefore, it would be counterproductive to directly restrain CER issuance by the CDM Executive Board. The best solution in terms of achieving the greatest environmental objective would be to find a way to retire excessive amounts of CER. Diminishing the supply side according to market concerns will prevent CER prices from decreasing in an uncontrollable way.

### 2.3.5 Preliminary Evaluation

The DNA plays a decisive role in determining eligible CDM projects.<sup>97</sup> Because of the DNA's role, it must create transparent criteria for granting approval to CDM projects such that the CDM Executive Board may supervise DNA activity and optimize the functioning of the CDM.<sup>98</sup> In addition to making

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92. UNEP, *supra* note 53, at 57.

93. See ZUMBACH, *supra* note 44, at 27-28 (explaining how CER issuance by the CDM Executive Board depends on the successful completion of the project pipeline).

94. *Id.* at 1.

95. LÜTKEN & MICHAELOWA, *supra* note 37, at 29.

96. Susanna Twidale, *Which price is right?*, in GOING WITH THE FLOW, SCALING UP THE TRANSFER OF LOW-CARBON TECHNOLOGY, TRADING CARBON, April 2009, at 22, 23.

97. See Robert O'Sullivan & Charles Cormier, *Meeting Participating Country Responsibilities under the CDM: Designating a National Authority*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 213, 216-19 (David Freestone & Charlotte Streck eds., Oxford University Press 2005).

98. See UNFCCC, *Annual Report of the Executive Board of the Clean Development Mechanism to the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol*, Poznan, Dec. 1-12, 2008, para. 103, Annex II, para. 10(c), U.N. Doc. FCCC/KP/CMP/2008/4 (Nov. 14, 2008), available at <http://unfccc.int/resource/docs/2008/cmp4/eng/04.pdf>.

it easier to compare national practices, supervision by the CDM Executive Board provides an incentive for states to apply high approval standards at the national level, thereby encouraging many different states to harmonize their practices.<sup>99</sup> Common international standards provide benefits to the international climate regime. Tough and early screening of CDM project ideas facilitates the final selection of meritorious CDM projects.

Broadly speaking, the CDM Executive Board should play a key role in the CDM. The Executive Board, however, has not been enshrined with sufficient powers to make decisive use of its crucial function, and the CDM governance processes deserves to be strengthened.<sup>100</sup> The Executive Board should strengthen its actions and take the lead on CDM project activities. As the central regulator and supervisor of CER issuances, the Executive Board can have a positive impact on participating countries and on market participants.

The most significant CDM concern is that GHG emissions are effectively reduced. The CDM fulfils its objective only if CER issuances correspond to real efforts to address climate change. For this reason, the regulators involved must focus on establishing clear measurement criteria to assess emission reductions. Although real difficulties arise from observing emission reductions, they may be partly overcome if the DOEs work professionally and possess the technical know-how required to monitor CDM project activities.

Moreover, concerns have been raised about accelerating the CDM process. The quality of CDM projects is not enhanced by the CDM project pipeline's unnecessary delays.<sup>101</sup> On the contrary, efficiency in the primary CDM market could help attract diligent and reliable project developers.<sup>102</sup> Timely issuance of CER would help reduce the regulatory barriers to entering the CDM market.<sup>103</sup> To achieve this purpose, the CDM needs a sufficient amount of capital and staff.

Last, but not least, the CDM has been criticized for benefiting wealthy project developers, as project developers with fewer resources cannot overcome the regulatory barriers to entering the market.<sup>104</sup> The CDM consequently favors the largest developing economies, i.e. China and India, while partly ignoring the

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99. See generally Ernestine Meijer & Jacob Werksman, *Keeping it Clean – Safeguarding the Environmental Integrity of the Clean Development Mechanism*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 191, 204-06 (David Freestone & Charlotte Streck eds., Oxford University Press 2005).

100. Ray Purdy, *Governance Reform of the Clean Development Mechanism after Poznań*, CARBON & CLIMATE L. REV. 5, 6, 15 (2009) (pointing out the need to improve the transparency of the procedures as well as to make current governance and structural issues more professional, and arguing that an appeal mechanism would enhance the credibility of the CDM Executive Board).

101. See Michaelowa & Müller, *supra* note 9, at 4.

102. See Luiz Gylvan Meira Filho, *Ideas for Implementation*, in ISSUES & OPTIONS, THE CLEAN DEVELOPMENT MECHANISM 39, 40 (José Goldemberg ed., UNDP 1998).

103. Cf. KJETIL RØINE ET AL., CARBON 2008, POST-2012 IS NOW, 17 (Kjetil Røine et al. eds., PointCarbon 2008).

104. See CAPOOR & AMBROSI, *supra* note 11, at 5.



development needs of poorer countries.<sup>105</sup> Therefore, the developing world deplores the CDM because it exacerbates the differences among developing countries in terms of attracting foreign investment.<sup>106</sup> Proper regulatory measures could stimulate investments in the least developed countries. Several scholars propose discounting as a solution because it would shift investors' preferences away from advanced developing countries, such as China, to less developed areas, such as Africa.<sup>107</sup> Discounting reduces the quantity of carbon credits issued for a project by attributing a smaller percentage of credits to buyers for the same price paid before.<sup>108</sup> If the largest developing countries were subject to higher discount rates than the least developed countries, CER buyers would have incentives to invest in the poorest countries because they would obtain a larger number of carbon credits for the same price.<sup>109</sup> Thus, this type of intervention mechanism would be effective in terms of stimulating investments in places where they are needed most.

### 3 THE REGULATION OF THE SECONDARY CER MARKET

#### 3.1 THE LEGAL NATURE OF CARBON UNITS

Broadly speaking, scholars have disagreed about whether CER should be termed a commodity or a currency. Although a great majority of researchers treat carbon units like commodities, some characteristics of carbon units do resemble currency, a fact that should not be completely neglected.<sup>110</sup> The right to emit GHG can be transferred, and carbon units constitute tradable units.<sup>111</sup> The products that market participants purchase in the secondary market are the CER.<sup>112</sup> It is worth recalling that the secondary market refers to carbon trading through exchange of previously issued CER. Carbon units generated under the CDM are therefore standardized emissions offset instruments, which can be traded like generic goods in a homogenous market.<sup>113</sup> Consequently, the industry tends to treat emission rights as commodities; the legal and policy literature are following this trend.<sup>114</sup> More precisely, some scholars classify carbon units as commodity derivatives.<sup>115</sup>

105. Schatz, *supra* note 35, at 724.

106. LÜTKEN & MICHAELOWA, *supra* note 37, at 11.

107. See Schatz, *supra* note 35, at 724, 735.

108. *Id.* at 728.

109. See Michaelowa & Müller, *supra* note 9, at 7.

110. Button, *supra* note 76, at 583.

111. See generally Petitpierre-Sauvain, *supra* note 3, at 99 (discussing the need for transferable carbon units in creating a functioning trading system under the Kyoto Protocol).

112. See Michaelowa & Jotzo, *supra* note 8, at 511.

113. Button, *supra* note 76, at 576.

114. *Id.* at 575-76; see, e.g., ZUMBACH, *supra* note 44, at 30.

115. Christin M. Forstinger & Alexander F. Wagner, *Emissionshandel und Aufsichtsrecht (Emission trading and capital market law)*, in OSTERREICHISCHES BANKARCHIV (AUSTRIAN JOURNAL OF BANKING), Issue 8, 2004, at

However, carbon units do not have all of the typical characteristics of a commodity. Carbon units would be worthless if an applicable regulatory framework did not recognize them. Unlike currencies, commodities do not derive their value from government certification.<sup>116</sup> Thus far, only the issuance of CER has fallen within the scope of the regulatory activities under the UNFCCC frameworks. Regulators, however, have paid much attention to the regulation of the secondary CER market,<sup>117</sup> which gives rise to concerns about the legal nature of carbon units. Indeed, the regulation of the secondary CER market depends on how legal systems characterize the issued CER. A liquid secondary market is designed to improve price discovery mechanisms in the sense that CER prices should reflect all the relevant information in an unbiased manner.<sup>118</sup> Therefore, uncertainty exists as to whether carbon units should really be classified as commodities.

At any rate, each carbon unit creates a right to transfer an entitlement to release a ton of GHG emissions into the atmosphere, which is regarded in most legal systems as a *sui generis* instrument: carbon units have their own characteristics and should not be included in a wider concept.<sup>119</sup> The Kyoto Protocol places limitations on the type of pollution and time frame for pollution on this entitlement to pollute.<sup>120</sup> In addition, national systems may bestow rights and obligations on private sector entities.<sup>121</sup> Therefore, a carbon unit is broadly defined as a *sui generis* right.<sup>122</sup>

Carbon units cannot be considered securities as the purpose of emission allowances differs completely from those of securities such as bonds or shares. Emission allowances provide the right to emit a ton of carbon dioxide or an equivalent but do not provide a valuable right in terms of participation or stake in a company.<sup>123</sup> Furthermore, unlike securities, which represent a part-ownership interest in an entity, carbon units are almost always completely separable from the regulated entity.<sup>124</sup>

Finally, carbon units could possibly be categorized as currency-like units. A few scholars already have mentioned this possibility,<sup>125</sup> as carbon markets

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607-14.

116. Button, *supra* note 76, at 577.

117. See ZUMBACH, *supra* note 44, at 36.

118. Cf. Ayling, *supra* note 23, at 88-89.

119. Wemaëre, *supra* note 64, at 72.

120. *Id.* at 73.

121. *Id.* at 76.

122. *Id.* at 72.

123. ZUMBACH, *supra* note 44, at 36.

124. Button, *supra* note 76, at 579.

125. E.g., Jürgen Lefevere, *Linking Emissions Trading Schemes: The EU ETS and the "Linking Directive"*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 511, 512 (David Freestone & Charlotte Streck eds., Oxford University Press 2005); Button, *supra* note 76, at 577-79; see also Carr & Rosembuj, *supra* note 5, at 48 (referring to carbon units as a currency, yet treating carbon units like

exhibit many of the characteristics of currency markets. First and foremost, a currency is worthless if it is not recognized by a government.<sup>126</sup> Second, to some extent, carbon markets function like currency markets.<sup>127</sup> The value of CER would practically disappear if they were no longer accepted to meet compliance requirements. This point hints at the importance of market participants' confidence in the carbon markets. Uncertainties about the future prospects of the CDM market are detrimental and create instabilities in the system. Furthermore, evidence shows that CER prices fluctuate widely and are more closely correlated with political and administrative processes shaping the implementation procedures for global climate change treaties than they are with traditional macro-economic factors.<sup>128</sup> However, the regulatory process affects CER prices to a greater extent than the environmental realities do, suggesting that carbon units are similar to currency units. Therefore, carbon units to some extent behave like currencies, which scholars should bear in mind when attempting to create efficient carbon markets, even if market participants trade carbon certificates like commodities.

### 3.2 THE IMPORTANCE OF THE CHARACTERIZATION OF CARBON UNITS AS A COMMODITY OR A CURRENCY

The legal characterization of carbon units matters with respect to the carbon market's financial design. Scholars already have begun to contemplate the need to create better linkages between various trading systems.<sup>129</sup> Currently, independent carbon markets tend to move towards linking with each other.<sup>130</sup> If a carbon unit is considered a currency, the carbon trading system can produce different units of exchange with independent relative value as well as a system of foreign exchange using fixed or floating rates.<sup>131</sup>

However, the convergence of global carbon markets may be almost impossible if carbon units are considered commodities. At the moment, various prices correspond to many different commodity markets; linking these markets would eventually mean that the prices should be globally uniform. In a homogenous

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commodities in the rest of the paper).

126. Button, *supra* note 76, at 577.

127. See Twidale, *supra* note 96, at 22.

128. Marte Nordseth et al., *CER Market Dynamics*, in *EQUAL EXCHANGE: DETERMINING A FAIR PRICE FOR CARBON* 11, 11 (Glenn Hodes & Sami Kamel eds., UNEP 2007), available at <http://www.cd4cdm.org/Publications/Perspectives/FairPriceCarbon.pdf> (last visited Jan. 8, 2010).

129. See generally, Wolfgang Sterk et al., *Prospects of linking EU and US Emission Trading Schemes: Comparing the Western Climate Initiative, the Waxman-Markey and the Lieberman-Warner Proposals*, at 23-24 (Climate Strategies, Working Paper No. 8, 2009).

130. See Andreas Tuerk et al., *Linking Emissions Trading Schemes, Synthesis Report*, CLIMATE STRATEGIES, May 2009, at 10-24, available at <http://www.climatestrategies.org/our-reports/category/33/148.html> (last visited Jan. 8, 2010).

131. Button, *supra* note 76, at 583.

commodity market, carbon units of lower quality are detrimental to the value of all the carbon units because these lower quality units may be used to fulfil compliance targets.<sup>132</sup> The risk of a race to the bottom would cause carbon prices to fall and remain very low. As opposed to this commodity model, a currency model would create a race to the top because low regulatory standards and practices would tend to devalue a carbon currency.<sup>133</sup> Competition between various carbon currencies would incentivize governments to establish high quality standards. Eventually, the fiction that all carbon units could ever be equivalent would disappear, and the environmental value of a carbon unit would be expressed in terms of its exchange value.<sup>134</sup>

A second aspect – the legal characterization of a carbon unit as a currency – plays an important role in the CDM market and would force the regulator to control the quantity of CER available in the market. Because carbon units are valuable only because of their artificial scarcity,<sup>135</sup> a central regulator would have to be responsible for the level of liquidity available in the carbon market in the same manner as central banks establish monetary policies.<sup>136</sup> Instead of providing a system with more liquidity, attention would most likely have to be given to limiting the number of carbon certificates in the carbon market.<sup>137</sup> This endeavor may prevent carbon prices from falling too far during economic downturns or other circumstances. Indeed, a quantitative approach is situated at the core of a cap-and-trade system, which focuses on quantity targets instead of price targets.<sup>138</sup> Where a carbon tax system fixes the price and quantity of GHG emissions generated will depend on the fixed price; alternatively, in a cap-and-trade system, the price depends on the fixed quantity available in the market.<sup>139</sup>

This reasoning may help overcome the negative effects a financial crisis has had on carbon prices. As a consequence of a financial crisis, Kyoto targets become much easier to meet due to a country's lower forecasted emissions, and efforts previously made to address climate change may be jeopardized. When there is less demand for carbon certificates because of an economic recession,

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132. *See id.* at 586, 589-90.

133. *Id.* at 590.

134. *Id.* at 588.

135. *See* Michael Grubb & Karsten Neuhoff, *Allocation and competitiveness in the EU emissions trading scheme: policy overview*, 6 CLIMATE POL'Y 7, 8 (2006), available at <http://www.eprg.group.cam.ac.uk/wp-content/uploads/2008/11/grubb.pdf>.

136. *See* Joseph Mason, *Guest Commentary, Carbon bank could steer US toward low cost reductions*, CARBON MARKET NORTH AMERICA, POINT CARBON, Oct. 9, 2009, at 6; *see also* Rolf H. Weber & Aline Darbellay, *Vers une évolution des marchés financiers au service de la protection de l'environnement*, in *ECONOMIE ENVIRONNEMENT ETHIQUE, DE LA RESPONSABILITE SOCIALE ET SOCIETALE* 401, 406 (Rita Trigo Trindade et al. eds., Schulthess 2009).

137. *Cf.* Mason, *supra* note 136, at 6.

138. *See* Joachim Weimann, *Klimapolitik im Zeitalter des Emissionshandels*, WIRTSCHAFTSWISSENSCHAFTLICHES STUDIUM 2009, No. 2, 2009, at 86, 87.

139. *Id.* at 87.

carbon prices tend to fall. Some buyers also sell their already acquired certificates, default, or try to breach their contracts, either because they no longer need the excess certificates to meet compliance requirements or because they need fresh capital to overcome the credit crisis.<sup>140</sup> These events harm the carbon market, leading carbon prices to fall further. The carbon market can even become illiquid as exchanges of emission certificates become less frequent.<sup>141</sup> A central regulator could prevent the prices from collapsing in the face of extreme events by retiring a certain volume of carbon certificates from the market.<sup>142</sup>

Another problem results from the fact that an economic recession generally brings low energy prices.<sup>143</sup> In turn, low energy prices imply less incentive to meet emission reduction targets. In principle, market participants are willing to make a greater effort to reduce their GHG emissions when energy prices are high. As long as low energy prices are associated with low carbon prices, the financial crisis hits the environment twice, as it becomes cheaper to pollute.

Low energy prices, however, do not need to be linked to low carbon prices. The central regulator should decouple the two. Logically, market participants tend to benefit from low energy prices and tend not to limit their consumption if they are able to buy emission certificates at a discounted price.<sup>144</sup> A decrease in demand for carbon certificates is actually not a direct consequence of low energy prices but of the economic recession. Evidence recently has shown that companies need fewer carbon certificates during a recession due to less market activity.<sup>145</sup> In this case, the carbon market becomes saturated with an excessive quantity of carbon certificates, such as CER, which could be addressed by the central regulator reducing the quantity of emission certificates available in the carbon market. By regulating in this manner, carbon prices would not fall excessively, and market participants would have incentives to keep their GHG emissions low instead of taking advantage of the low carbon prices. Thus, low energy prices should not always dictate that carbon prices must be low. It may therefore be possible to make energy prices and carbon prices move almost independently from each other, which would be to the benefit of environmental policies.

### 3.3 THE REGULATION AND SUPERVISION OF MARKET PARTICIPANTS' TRADING ACTIVITIES

The regulation of the carbon market is dispersed and not yet comprehensive.

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140. See *CER buyers*, *supra* note 20, at 1; see also *Emission Trading*, *supra* note 21, at 24.

141. See *CDM Market Comment*, *supra* note 21, at 2 (describing the varying differences in expectations between buyers and sellers that have caused bids and offers for primary CERS to remain far apart over time).

142. Weber & Darbellay, *supra* note 136, at 406.

143. See CAPOOR & AMBROSI, *supra* note 11, at 47; see also *Emission Trading*, *supra* note 21, at 22 (arguing that an economic slowdown adversely affects energy and carbon prices).

144. See *Emission Trading*, *supra* note 21, at 22.

145. CAPOOR & AMBROSI, *supra* note 13, at 2; see *Emission Trading*, *supra* note 21, at 22.

The rulemaking for the primary CDM market falls within the scope of the CDM Executive Board's responsibility.<sup>146</sup> Not only does the underlying emissions market need to be regulated, but the trading activities in the secondary CER market also need to be regulated. However, no specific attention has been paid to the regulation of trading activities on a global scale.<sup>147</sup> National authorities remain responsible for regulating and supervising the carbon market within their jurisdiction,<sup>148</sup> and most of them have not focussed on the trading of emission reduction certificates.

It is worth examining the regulation of the secondary CER market in the European context because the European Union has thus far developed the most elaborate trading scheme. The European Union Emissions Trading is regulated by the European Commission along with national supervisors who oversee the market participants' trading activities.<sup>149</sup> In particular, the Markets in Financial Instruments Directive ("MiFID") strives to harmonize the provision of financial services in the European Union.<sup>150</sup> Beyond that, domestic regulation and supervision also apply to financial services providers.<sup>151</sup>

More precisely, the regulatory status of a specific trading activity depends on the classification of the financial instrument as well as on the nature of the instrument provider's activity.<sup>152</sup> The MiFID embeds emission derivatives as a trading activity within its scope of responsibility.<sup>153</sup> Emission spot contracts, however, do not fall within the scope of the MiFID and may remain unregulated if the national legislation does not state otherwise.<sup>154</sup> Unlike emission derivatives, which are considered to give rise to regulatory issues similar to financial instruments falling under the MiFID, emission spot contracts do not embed the same risks and are not included in the scope of the directive.<sup>155</sup> Thus, only emission trading involving derivatives retains the attention of financial market regulators and supervisors.<sup>156</sup>

Furthermore, the MiFID foresees exemptions from its application depending

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146. See generally Meijer & Werksman, *supra* note 99, at 204-06.

147. See David L. Downie & Marc A. Levy, *The UN Environment Programme at a Turning Point: Options for Change*, in *THE GLOBAL ENVIRONMENT IN THE TWENTY-FIRST CENTURY: PROSPECTS FOR INTERNATIONAL COOPERATION* 355, 365-66, 369-70 (Pamela S. Chasek ed., 2000).

148. See, e.g., JONATHAN HILL ET AL., FINANCIAL SERVICES AUTHORITY [FSA] COMMODITIES GROUP, *THE EMISSIONS TRADING MARKET: RISKS AND CHALLENGES* 10 (2008), available at [http://www.fsa.gov.uk/pubs/other/emissions\\_trading.pdf](http://www.fsa.gov.uk/pubs/other/emissions_trading.pdf).

149. See, e.g., Council Directive 2003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading, art. 9, 14, 2003 O.J. (L 275) 32.

150. Council Directive 2004/39/EC Markets in Financial Instruments, *pmbl.*, para. 2, 2004 O.J. (L 145) 1 [hereinafter MiFID].

151. See, e.g., Hill et al., *supra* note 148, at 10.

152. *Id.* at 11.

153. MiFID, *supra* note 150, Annex 1, section C, para. 10.

154. See generally Hill et al., *supra* note 148, at 10.

155. Cf. MiFID *supra* note 150, *pmbl.*, para. 4.

156. See, e.g., Hill et al., *supra* note 148, at 10.

on the nature of the instrument provider's activity.<sup>157</sup> For example, persons dealing on their own account in emission derivatives are exempted from the MiFID if their trading activity is an ancillary activity to their main business, except if their main business falls within the scope of the MiFID.<sup>158</sup> This fact signifies that the end buyers of emission certificates are in principle unregulated because their main business is not related to providing financial services. They generally need the acquired emission certificates for compliance purposes, i.e., they are not engaged in trading activities but purchase the certificates for their own account. Therefore, end buyers are not directly subject to the regulatory and supervisory issues resulting from the MiFID.

Consequently, national regulators and supervisors only deal with derivatives contracts of regulated entities,<sup>159</sup> such as investment banks, insurance companies, and carbon funds. Regulators establish financial market frameworks such as the stock exchange, banking, and insurance acts.<sup>160</sup> Although the financial market supervisors include emission derivatives in their oversight, they do not apply specific treatment to them as they do with other kinds of derivatives.<sup>161</sup>

Regulators and supervisors may intervene in many areas. For instance, regulators establish eligibility criteria to restrict emission trading activity to qualified financial services providers.<sup>162</sup> Financial intermediaries interested in trading regulated emission certificates therefore must request an authorization or license from the competent financial market supervisor.<sup>163</sup> There also are disclosure requirements for the regulated markets.<sup>164</sup> Further, market discipline implies that the regulators and supervisors address abuse in the carbon market. Although these regulatory issues have not yet raised much concern in terms of emission derivatives, it is likely that they will become more important in the future.

The current situation is not satisfactory because the carbon market is characterized by too many regulatory entities and simultaneously too many unregulated activities.<sup>165</sup> The regulatory and supervisory entities are principally national entities, and their competence depends on the national or regional frameworks.<sup>166</sup> Moreover, these national or regional frameworks determine what types of activities fall within the scope of regulation. In the long term, the existence of an international supervisor would allow the establishment of clear rules in the

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157. See MiFID, *supra* note 150, pmb., para. 16.

158. *Id.* art. 2, para. 1(i).

159. See, e.g., Hill et al., *supra* note 148, at 11-12.

160. See, e.g. PETER NOBEL, SCHWEIZERISCHES FINANZMARKTRECHT, EINFÜHRUNG UND ÜBERBLICK 456-57 (2d ed., Stämpfli Verlag AG 2004) (explaining how Switzerland has implemented financial market frameworks).

161. See, e.g., Hill et al., *supra* note 148, at 10.

162. See MiFID, *supra* note 150, pmb., para. 17.

163. See *id.* art. 5.

164. See *id.* art. 40, para. 3.

165. Hill et al., *supra* note 148, at 10.

166. The regulation and supervision of carbon contracts and other financial products related to emission trading depend on the intervention of national or regional financial market authorities.

carbon market. Although unified regulation and supervision would be beneficial to the carbon market, the creation of a consolidated authority seems unlikely to happen in the near future. Indeed, countries are not keen on losing a part of their sovereignty for the benefit of supranational regulators and supervisors. Nevertheless, some harmonization could at least be reached by an international private organization that establishes soft law in order to provide national supervisors with standards and criteria. Countries should be aware of the specific concerns raised by the oversight of the carbon market and ensure that their national authorities possess the necessary knowledge. Finally, the competent regulators and supervisors should account for the particularities of the carbon market and apply an adequate and adapted treatment to emission derivatives.

#### 4 THE ROLE OF FINANCIAL INTERMEDIATION IN THE CDM MARKET

##### 4.1 THE SOURCES OF SUPPLY AND DEMAND IN THE CDM MARKET

###### *i. The Project Developers*

Supply in the CDM market accrues from project developers in developing countries. These project developers have incentives to take environmental objectives into account in their decisions because they can sell CER from CDM project activities. In this regard, projects in unregulated countries that generate GHG emission reductions can benefit from the market mechanisms under the Kyoto Protocol. States and companies can take advantage of carbon finance to raise funds for their own projects. In principle, project owners need financing prior to carrying out their project, and without the cash flow arising from the CDM, developers would not be able to fund their projects. Therefore, successful project creation must contribute to the realization of the additionality requirement.

###### *ii. The Ultimate Buyers*

Various types of ultimate buyers of CER play a role in the CDM market. A major distinction can be drawn between compliance buyers and voluntary buyers. First, compliance buyers comprise industrialized economies or companies having emission reduction targets.<sup>167</sup> Legally binding reduction targets can arise directly from Kyoto related commitments. Industrialized countries have agreed to reduce their GHG emissions by a certain amount as compared to the year 1990.<sup>168</sup>

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167. Hill et al., *supra* note 149, at 10; Carr & Rosembuj, *supra* note 5, at 52. The regulation and supervision of carbon contracts and other financial products related to emission trading depend on the intervention of national or regional financial market authorities; as far as the CDM is concerned, even if the CDM Executive Board regulates CER issuance, the regulation and supervision of market participants' trading activities remain in the scope of national or regional financial market authorities as in the broader carbon market.

168. See CAPOOR & AMBROSI, *supra* note 11, at 49.



Pursuant to the flexible carbon mechanisms, the purchase of emission reductions credits, for instance CER, helps to overcome the scarcity of emission certificates. Alternatively, some national programs have established their own emissions trading systems.<sup>169</sup> By linking their systems to flexible mechanisms under the Kyoto Protocol, companies that have reduction targets under a national program will be in a position to purchase carbon credits, such as CER, to satisfy their commitments.<sup>170</sup> The most important regional system is the EU ETS.<sup>171</sup> This program is linked to the CDM so that entities regulated by the EU ETS can use a certain percentage of CER to comply with their caps.<sup>172</sup>

Second, outside of the regulated markets, project developers also may sell carbon credits to the voluntary carbon markets.<sup>173</sup> These markets encompass voluntary commitments to address climate change that arise directly from the private sector. A voluntary carbon market has developed in the United States.<sup>174</sup> Broadly speaking, the Voluntary Carbon Standard Program ("VCS") provides transparency and credibility to the voluntary offset market through the establishment of standards.<sup>175</sup> Carbon credits under the voluntary market are called Voluntary Carbon Units ("VCU").<sup>176</sup> In addition, the VCS recognizes GHG project activities around the world and approves of the CDM Program.<sup>177</sup> Therefore, companies participating in the voluntary offset program may purchase CER and choose to have CER transferred into VCU.<sup>178</sup>

Therefore, CER demand may stem from sovereign states trying to fulfil their Kyoto-related commitments or from non-state entities that have legislative or voluntary commitments to reduce their GHG emissions.<sup>179</sup> All ultimate buyers of CER know the quantity of CER they are willing to purchase. In order to achieve their objectives, they need to have a sufficient level of certainty about the amount of CER generated through the CDM project.

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169. Tuerk, *supra* note 130, at 1.

170. *Id.* at 36, 46, 48.

171. See generally Weber, *supra* note 70, at 484-86.

172. Orlando et al., *supra* note 70, at 71; Sterk et al., *supra* note 129, at 8.

173. See Charlotte Streck, *Marketing CERs: Legal and Contractual Issues for Sellers*, in *THE KYOTO PROTOCOL AND BEYOND: LEGAL AND POLICY CHALLENGES OF CLIMATE CHANGE* 79, 85 (W.Th. Douma et al. eds., T.M.C Asser Press 2007).

174. See CAPOOR & AMBROSI, *supra* note 11, at 17, 41.

175. VOLUNTARY CARBON STANDARD, VOLUNTARY CARBON STANDARD PROGRAM GUIDELINES 2007.1 4 (Nov. 18, 2008), available at [http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%20Program%20Guidelines%202007\\_1.pdf](http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%20Program%20Guidelines%202007_1.pdf).

176. *Id.* at 3.

177. See *id.* at 10.

178. *Id.*

179. UNITED NATIONS ENVIRONMENT PROGRAMME [UNEP], *THE UNEP PROJECT CD4CDM, GUIDEBOOK TO FINANCING CDM PROJECTS* 18 (2007), available at <http://www.cd4cdm.org/Publications/FinanceCDMprojectsGuidebook.pdf>.

## 4.2 THE FUNCTIONS PROVIDED BY FINANCIAL INTERMEDIARIES

### 4.2.1 Bringing Together Suppliers and Buyers

The proper functioning of the carbon market depends on the possibility of exchanging carbon certificates. The idea of transferability of issued CER already is embedded in the use of the market mechanism to reduce GHG emissions. Fungibility is therefore an essential requirement to the success of the CDM.<sup>180</sup> In fact, trades facilitate price discovery mechanisms so that the CDM market is able to work more efficiently. A certain level of market activity also helps to guarantee the stability of the CDM market. Accordingly, concerns have been raised about how to promote exchanges in the CDM market.<sup>181</sup>

Attention also should be given to the materialization of exchanges in the CDM market. Countries or companies that need emission certificates may directly enter into contracts with project developers.<sup>182</sup> However, difficulties emerge because imperfect information means that it takes time for parties to find each other. Making adequate information available is necessary to facilitate contracting. Moreover, market participants must comply with governance mechanisms and face the high costs of finding projects and partners.<sup>183</sup> Specialist intermediaries are able to fulfil this function in a more efficient way. Further, market participants have different expectations. Financial intermediaries are able to reconcile their needs, thereby permitting transactions to occur in the CDM market. Therefore, financial intermediaries' intervention in the CDM market is necessary to bring together borrowers and lenders, i.e. suppliers and end users.<sup>184</sup> Because carbon units are transferable goods, financial intermediaries are automatically vital market actors in the trading process.

Various kinds of financial intermediaries play specific roles in the CDM market, including (i) electronic platforms for exchange, (ii) brokers, and (iii) traders.

(i) Electronic platforms for exchange provide data about buyers and sellers of CER as well as the market price for CER.<sup>185</sup> Some examples are the European Climate Exchange ("ECX"), European Energy Exchange ("EEX"), Climex, BlueNext, Asia Carbon Exchange, IntercontinentalExchange ("ICE"), and Chicago Climate Exchange ("CCX").<sup>186</sup> When a transaction is validated, these

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180. ZUMBACH, *supra* note 44, at 31.

181. Humphrey, *supra* note 32, at 86-87.

182. See Renato Marioni, *Les mécanismes de flexibilité dans la pratique*, LA VIE ÉCONOMIQUE, REVUE DE POLITIQUE ÉCONOMIQUE, Issue 9, 2007, at 16-17.

183. Humphrey, *supra* note 32, at 86.

184. See NASSER ARSHADI & GORDON V. KARELS, *MODERN FINANCIAL INTERMEDIARIES AND MARKETS* 27 (1997).

185. See CAPOOR & AMBROSI, *supra* note 11, at 7.

186. *Id.* at 59; ZUMBACH, *supra* note 44, at 41; see also ROLF H. WEBER & BRIGITTA KRATZ, *ELEKTRIZITÄT-SWIRTSCHAFTSRECHT* 339-40 (Stämpfli Verlag AG 2005); Hill et al., *supra* note 148, at 13-14.

platforms are primarily responsible for settlement and delivery of CER.<sup>187</sup> In fact, the delivery of CER means that the transaction registries have completed the transfer of CER. In addition, the UNFCCC CDM Bazaar is a platform for exchange of information on CDM.<sup>188</sup>

(ii) Brokers are involved in finding counterparties;<sup>189</sup> the broker is paid a fee for providing this service.<sup>190</sup> Once buyers and sellers find each other, they may contract directly with each other.<sup>191</sup> For instance, the leading global company engaged in brokering activities is CantorCO2e.<sup>192</sup>

(iii) Traders purchase CER on their own account.<sup>193</sup> Traders primarily buy and sell at a profit.<sup>194</sup> By doing so, they facilitate price discovery mechanisms in the CDM market. They also contribute to the development of CDM projects. One of the major generators of CDM credits is the London-listed EcoSecurities.<sup>195</sup>

#### 4.2.2 Managing Risks

CDM project activities are associated with relatively high risks. There are two broad categories of risk.<sup>196</sup> On one hand, there are project risks that arise out of the physical implementation necessary to reduce GHG emissions,<sup>197</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>198</sup> On the other hand, there are two types of regulatory risks: first, there are risks related to the rules of the CDM; second, there are risks related to the broader carbon market.<sup>199</sup>

The first type of regulatory risk includes the uncertainty related to the registration and issuance process as well as related to the future prospects of the Kyoto Protocol's CDM.<sup>200</sup> The most important source of risk lies within the primary CDM market. In principle, buyers face several risks to non-delivery,

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187. See ZUMBACH, *supra* note 44, at 41.

188. See About the CDM Bazaar, CDM Bazaar, <http://www.cdmbazaar.net/about> (last visited Jan. 8, 2010).

189. Marioni, *supra* note 182, at 17-18.

190. See generally STUART I. GREENBAUM & ANJAN V. THAKOR, *CONTEMPORARY FINANCIAL INTERMEDIATION* 44 (2d ed., Academic Press 2007).

191. Marioni, *supra* note 182, at 17-18.

192. *Id.* at 18.

193. *Id.* at 17 (explaining that traders bear market risks while purchasing carbon certificates and selling them in the carbon market).

194. *Cf. id.* at 17.

195. CAPOOR & AMBROSI, *supra* note 11, at 59, Figure 8; Marioni, *supra* note 182, at 18; see Who we are, Eco Securities, [http://www.ecosecurities.com/Home/EcoSecurities\\_\\_the\\_carbon\\_market/Who\\_we\\_are/default.aspx](http://www.ecosecurities.com/Home/EcoSecurities__the_carbon_market/Who_we_are/default.aspx) (last visited Jan. 8, 2010).

196. Carr & Rosembuj, *supra* note 5, at 55.

197. *Id.*

198. ZUMBACH, *supra* note 44, at 26.

199. See Carr & Rosembuj, *supra* note 5, at 55.

200. See ZUMBACH, *supra* note 44, at 26.

including possible project rejection by the CDM Executive Board, operational problems with a CDM project, natural disaster, insolvency, and political risks.<sup>201</sup> Buyers are concerned that CDM projects may deliver fewer credits than they anticipated. This specific risk is significant in practice because the situation is likely to occur in a number of cases.

The second type of regulatory risk concerns risks that come from the broader carbon market but affect the CDM market.<sup>202</sup> For instance, CER demand is reduced when the European Union limits the use of CDM by European companies to meet their EU ETS reduction targets, thereby exerting a downward pressure on CER prices. Furthermore, the fact that Russia can sell a significant number of carbon certificates also contributes to decreased CER prices and adds competition for CER suppliers.<sup>203</sup>

Therefore, financial intermediaries are involved in helping the contracting parties to manage their risks. In particular, they support parties in structuring their contracts with a view towards risk allocation.<sup>204</sup> This enables parties to a CDM agreement to transact even though the buyer or the seller is not willing to take certain specific risks. Moreover, the insurance sector's function would logically consist of insuring parties against damages resulting from the realization of certain risks. The contracting parties thus could benefit from the opportunity to shift specific risks to a third party. If insurance policies are available, transactions may occur more easily, enhancing CDM market activity.

#### 4.2.3 Pooling Economic Resources

Carbon funds have given the CDM market a tremendous boost.<sup>205</sup> The completion of large CDM projects depends on the pooling of sufficient resources through the use of funds to support valuable CDM projects. Raising significant funds enables a single counterparty to invest in a large number of small projects. It is likely that specialized funds could better implement CDM projects, monitor the project developers more effectively, and efficiently screen for good-quality,

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201. *CER buyers*, *supra* note 20, at 1.

202. Carr & Rosembuj, *supra* note 5, at 55.

203. See CAPOOR & AMBROSI, *supra* note 11, at 24 (describing the likely competition from new supply from Russia, Ukraine, Poland, and Latvia among other countries); Christopher Carr & Flavia Rosembuj, *World Bank experiences in contracting for emission reductions*, 15 ENVTL. LIABILITY 114, 118 (2007), available at [http://wbcarbonfinance.org/docs/Banks\\_experience\\_in\\_contracting\\_emission\\_reductions.pdf](http://wbcarbonfinance.org/docs/Banks_experience_in_contracting_emission_reductions.pdf) [hereinafter *World Bank experiences*] (naming the risk that goes to the regulatory status of CER "Kyoto risk", which encompasses every kind of regulatory risk involved in developing a Kyoto-compliant project, that is, not only regulatory risk related to CDM issues but also regulatory risk related to the broader carbon market).

204. See generally Charlotte Streck, *World Bank Carbon Finance Business: Contracts and Emission Reductions Purchase Transactions*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 355, 362-63 (David Freestone & Charlotte Streck eds., 2005).

205. PAUL A.U. ALI & KANAKO YANO, *ECO-FINANCE: THE LEGAL DESIGN AND REGULATION OF MARKET-BASED ENVIRONMENTAL INSTRUMENTS* 61 (Daniel Bodansky & David Freestone eds., 2004).

small projects.

The World Bank has played a pioneering role in carbon finance. Its Prototype Carbon Fund ("PCF") began purchasing carbon in 2000.<sup>206</sup> The PCF collects contributions from participating entities, uses them to finance projects reducing GHG emissions, and distributes the generated emission reductions to the contributing entities pro rata.<sup>207</sup> Within the PCF, the World Bank enters into ERPA and directly participates in the carbon market.<sup>208</sup> Therefore, market participants are given a valuable example of how to structure CDM transactions.<sup>209</sup> Indeed, the PCF is considered a "trail blazer" for other similar funds that might be launched by other international financial institutions or the private sector.<sup>210</sup>

In fact, the majority of the carbon funds currently operating are modelled after the World Bank's PCF; most of them are public-private partnerships that are open to investment from both governments and private sector entities and managed by a governmental entity or a private company.<sup>211</sup> For example, in Switzerland, there are incentives to take private measures first; if private measures are insufficient, a carbon tax is established.<sup>212</sup> In particular, the Climate Cent Foundation<sup>213</sup> is a voluntary measure created by Swiss industry. Funding is provided by a charge levied on all imports of petrol and diesel.<sup>214</sup> The climate protection fund then purchases carbon certificates and transfers them to the Swiss Confederation to reach Kyoto compliance; the bulk of the acquired certificates are generated through the CDM.<sup>215</sup> For this reason, the Climate Cent Foundation transacts with other climate protection funds or brokers, such as CantorCO2, or traders, such as EcoSecurities, or contracts directly with project developers in developing countries.<sup>216</sup>

#### 4.2.4 Transferring Economic Resources Across Time and Space

Financial intermediaries help to transfer resources when buyers' and sellers' preferences are unaligned. In the primary CDM market, timing is a decisive issue. Because CER are only delivered upon the completion of a long approval

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206. Streck, *supra* note 204, at 355.

207. *World Bank experiences*, *supra* note 203, at 114.

208. *Id.*

209. *See generally* Streck, *supra* note 204, at 356.

210. David Freestone, *The UN Framework Convention on Climate Change, the Kyoto Protocol, and the Kyoto Mechanisms*, in *LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK* 3, 18 (David Freestone & Charlotte Streck eds., 2005).

211. Ali & Yano, *supra* note 205, at 63.

212. *See Bundesgesetz über die Reduktion der CO<sub>2</sub>-Emissionen [CO<sub>2</sub>-Gesetz] [Federal Law on the Reduction of CO<sub>2</sub> emissions, CO<sub>2</sub> Act]* Oct. 8, 1999, SR 641.71, arts. 3, 4 (Switz.).

213. *See* Climate Cent Foundation, *Portrait*, <http://klimarappen.ch/en/foundation/portrait.html> (last visited Jan. 18, 2010).

214. *Id.*

215. *See id.*

216. *See* Marioni, *supra* note 182, at 17-18.

process, more immediate funding is sometimes needed to realize a CDM project.<sup>217</sup> For example, at least a part of the project price is generally paid prior to project execution. Therefore, buyers would like to get the CER as soon as possible.<sup>218</sup> Financial intermediaries intervene to overcome this mismatch of preferences.<sup>219</sup> As a result, some financial institutions are engaged in fundraising. They give a tremendous boost to the CDM because they use their funds to make CDM projects possible and sell the subsequently issued CER to their investors, namely end buyers in need of emission certificates.<sup>220</sup>

Further, the geographic component plays an important role because the cash flows are transferred from industrialized to developing economies. Difficulties can arise when counterparties do not know each other.<sup>221</sup> Therefore, specialized intermediaries work with project developers in the developing world.<sup>222</sup> They are able to transfer resources efficiently across space, and their specific knowledge enables them to choose high-quality CDM projects, thereby pursuing environmentally friendly or socially responsible goals.<sup>223</sup>

#### 4.3 CER TRADING AND INNOVATIVE FINANCIAL PRODUCTS

Innovative instruments have been introduced into the CDM market, satisfying the needs of various market participants with specific interests. To develop the relatively young CDM market, financial intermediaries have had to adopt a pioneering approach.

##### 4.3.1 The Contracting Structures of CDM Projects

In the primary CDM market, the parties involved in the CDM conclude emission reduction purchase agreements ("ERPA") leading to contractual commitments.<sup>224</sup> An increasing number of carbon contracts are becoming available.<sup>225</sup> Contracting structures are becoming very sophisticated in order to market the CER. Project developers that are able to obtain financing for their projects without taking into account a fixed cash flow from the sale of CER may 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>226</sup>

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217. See Streck, *supra* note 173, at 81.

218. Cf. *id.* at 83-84.

219. See Humphrey, *supra* note 32, at 86-87.

220. Ali & Yano, *supra* note 205, at 61.

221. See GREENBAUM & THAKOR, *supra* note 190, at 44.

222. See Marioni, *supra* note 182, at 17-18.

223. Cf. Ali & Yano, *supra* note 205, at 63.

224. CAPOOR & AMBROSI, *supra* note 11, at 69.

225. *Id.* at 64.

226. Streck, *supra* note 173, at 79.

Most ERPA are forward contracts.<sup>227</sup> These contracts are individually negotiated and not standardized.<sup>228</sup> They are thus traded over-the-counter (“OTC”).<sup>229</sup> In such contracts, the buyers and sellers in advance fix the price, the timing of the delivery, and the volume of the carbon credits being generated.<sup>230</sup> For many project developers, the forward sale of CER provides an important opportunity to obtain additional cash flow for their project.<sup>231</sup> Accordingly, sellers negotiate upfront payments that help them to finance their projects. In addition, buyers take advantage of spot trading because of immediate settlement. Spot contracts are principally very standardized and fairly simple agreements.<sup>232</sup> The secondary CER market is characterized by the presence of many spot contracts, which can be efficiently traded through an exchange.<sup>233</sup> Further, price volatility may be partially neutralized through the use of derivatives such as futures.<sup>234</sup> Finally, other types of contracts exist, such as CER swaps, strips and options.

#### 4.3.2 The Risk Allocation Issue

Broadly speaking, effective carbon contracts should record the agreement between the parties, allocate risks, establish rights, create clear and enforceable obligations, and identify responsibilities.<sup>235</sup> The allocation of CDM risks between the buyer and the seller is a primary objective of the ERPA, defining the relationship between counterparties in a market characterized by a wide variety of uncertainties and risks.

In a forward contract, the buyer eventually assumes high risks.<sup>236</sup> Transactions are not likely to occur if the seller does not agree to concede certain rights to the buyer. In fact, many ERPA under which project developers sell their CER include delivery guarantees, penalties, and strict enforcement clauses.<sup>237</sup> From the buyer’s perspective, CER traded on the spot market should ideally be free from all project and regulatory risks.<sup>238</sup> However, because the CDM market is highly

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227. CAPOOR & AMBROSI, *supra* note 13, at 31; see Martijn Wilder et al., *Carbon Contracts, Structuring Transactions: Practical Experiences*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK 295, 304 (David Freestone & Charlotte Streck eds., 2005).

228. See Nordseth et al., *supra* note 128, at 11.

229. Cf. Marcel Meinhardt & Nadin Schwibs, *Standardisierte Verträge im Stromhandel – der EFET-Rahmenvertrag*, in STROMHANDEL 103, 106-07 (Rolf H. Weber ed., 2007) (referring to the electricity market).

230. Orlando et al., *supra* note 70, at 73.

231. Streck, *supra* note 173, at 79.

232. *Id.* at 79.

233. See Point Carbon, *Nordpool launches CER spot contract*, CARBON MARKET EUROPE, Nov. 6, 2009, at 6.

234. Panagiotis Delimatsis, *Financial Innovation and Climate Change: The Case of Renewable Energy Certificates and the Role of the GATS*, 8 WORLD TRADE REV. 439, 445 (2009).

235. Streck, *supra* note 173, at 80.

236. See, e.g., Grubb & Neuhoff, *supra* note 135, at 14 (explaining that companies gain more knowledge about carbon prices by taking advantage of waiting instead of purchasing carbon certificates in advance).

237. Streck, *supra* note 173, at 79.

238. *Id.* at 84.

volatile, it is risky for the seller to wait for CER issuance and sell on the spot market.<sup>239</sup> Spot contracts are advantageous for the seller if CER prices tend to rise<sup>240</sup> by allowing the seller to take advantage of increases in CER prices. Nevertheless, if the CER price decreases, a seller who waited for CER issuance in order to sell through a spot contract bears the loss. In sum, contracting issues are very challenging in the CDM market because of sellers' and buyers' different preferences that need to be reconciled.

Insurance could become an important sector because of the high risks associated with CDM projects. However, although the insurance sector was expected to play a significant role in the CDM, market participants thus far have not shown much interest in buying insurance policies.<sup>241</sup> Surprisingly, the insurance sector has not been successful with respect to CDM. Consequently, project developers bear the full risk with respect to CER issuance. Only a handful of insurance instruments have been launched by financial intermediaries.<sup>242</sup> Nevertheless, some specialized intermediaries do intervene in the CDM process in order to guarantee CDM delivery.<sup>243</sup>

The insurance industry could play a role in the CDM market through innovative financial contracts.<sup>244</sup> Contract terms would need to clearly specify which risks the insurance target will cover.<sup>245</sup> Swiss Re launched the first insurance product for managing Kyoto-related risk in 2006; RNK Capital LLC, a New York-based private investment firm specializing in the American and international environmental markets, provides coverage for the risks related to CDM project registration and CER issuance.<sup>246</sup> In addition, Munich Re created the Kyoto Multi Risk Policy.<sup>247</sup> Other types of insurance products can help buyers hedge against price falls.

Unfortunately, insurance instruments have not been successful thus far because traders may consider them too expensive; other market participants,

239. See, e.g., Grubb & Neuhoff, *supra* note 135, at 14 (pointing out the volatility of the carbon market and that carbon prices cannot be easily predicted).

240. If CER prices rise, the seller will benefit from the price increase while waiting for CER issuance and engaging in a spot contract.

241. Susanna Twidale, *Several companies are offering insurance to the carbon market, but uptake has been slow*, in POINT CARBON SPECIAL REPORT: INSURANCE 30, 31 (Point Carbon ed., Nov. 2009), (explaining that it has been larger compliance buyers who have taken out the insurance policies).

242. See *Swiss Re launches Kyoto-related insurance*, CANADIAN UNDERWRITER, June 13, 2006, <http://www.canadianunderwriter.ca/issues/1Sarticle.asp?aid=1000053317&PC=> (last visited Jan. 8, 2010) (arguing that Swiss Re partnered with RNK Capital LLC to launch the first insurance product for managing Kyoto-related risks in 2006); see also Twidale, *supra* note 241, at 30 (providing examples of a handful of insurance companies having launched insurance products).

243. See CAPOOR & AMBROSI, *supra* note 13, at 39 (explaining that guaranteed CER can be sold by financial intermediaries at a premium price over CER that are sold without delivery guarantees).

244. See Wilder et al., *supra* note 227, at 311.

245. See *id.* at 310-11.

246. *Swiss Re launches Kyoto-related insurance*, *supra* note 242.

247. Munich Re, *supra* note 34, at 30.



however, should envisage buying insurance products because they have a greater interest in being well-insured against risks, and from their perspective, insurance might be worth the price.<sup>248</sup> If the various CDM-related risks can be calculated more efficiently in the future thanks to the increase of historic track records, insurers will likely be in a position to price their products in a better way, thereby making them more attractive for the investing community. At any rate, there is room for improvement in the future.

Another example is the secondary market for guaranteed CER ("gCER"), which has seen recent growth.<sup>249</sup> A secondary seller – such as a market aggregator or a bank – sells gCER contracts that are typically secured through a slice of the seller's carbon portfolio.<sup>250</sup> This segment can play a determinant role when doubts about timely delivery of issued CER boosts demand and liquidity for exchange-traded contracts of gCER as buyers seek compliance security.<sup>251</sup>

One efficient way to shift the regulatory risk to the buyer could be by selling Verified Emission Reductions ("VER") instead of CER.<sup>252</sup> VER are not generated under the terms and conditions of the Kyoto Protocol but are generated on a voluntary basis by private actors.<sup>253</sup> There are a few institutional buyers who offer to buy VER and convert them into CER.<sup>254</sup> Doing so, these intermediary buyers take the regulatory risk off of the project developer or the end buyer. For instance, the World Bank, through its PCF, purchases VER.<sup>255</sup> The PCF acts as a kind of adaptation fund, reducing the negative effects relating to the uncertainties about the post-Kyoto future of the CDM. This endeavor has a stabilizing role because VER are recognized under certain programs and can be used instead of CER, thereby assuaging the market participants' apprehension about the use of CER in the future.

#### 4.3.3 The Pricing Mechanisms

In the primary CDM market, the negotiation of contract terms determines the pricing process. Because CER contracts are not standardized, CER prices depend, to a large extent, on the risk allocation between the buying and selling parties; the primary CDM market is likely to remain non-standardized with the negotiation of individualized terms in the ERPA.<sup>256</sup>

The secondary CDM market tends to be more transparent and standardized.<sup>257</sup>

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248. CAPOOR & AMBROSI, *supra* note 12, at 35.

249. CAPOOR & AMBROSI, *supra* note 11, at 3.

250. *Id.*

251. *Id.* at 20.

252. Streck, *supra* note 173, at 85.

253. ZUMBACH, *supra* note 44, at 42.

254. Streck, *supra* note 173, at 85.

255. *Id.*

256. Nordseth et al., *supra* note 128, at 11.

257. CAPOOR & AMBROSI, *supra* note 13, at 38.

In the secondary market segment, price discovery mechanisms can be facilitated by carbon exchanges. The CDM market is, however, characterized by a low degree of liquidity and high volatility.<sup>258</sup> The level of market activity is not high enough to promote market stability.

To some extent, pricing mechanisms already have 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.<sup>259</sup> First, the more risks the supplier agrees to assume, the higher the price the buyer will be willing to pay. Second, CER prices tend to increase as the project advances in the CDM project pipeline.<sup>260</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 tend to widen spreads. However, when secondary CER prices dropped at the end of 2008, the price spread between secondary CER and primary CER narrowed in such a way that many buyers preferred to simply buy guaranteed CER in the secondary market.<sup>261</sup>

## 5 TRENDS AND OUTLOOK

### 5.1 TRANSPARENCY AND THE LINK BETWEEN THE PRIMARY AND THE SECONDARY CDM MARKET

Transparency is an important element of the carbon market. Nevertheless, the CDM market continues to be characterized by a low degree of transparency.<sup>262</sup> Thus, transparent exchanges must be promoted in order to create efficient markets. The development of additional platforms for auctions could also help reduce the gap between the primary and secondary markets, i.e. between the market for CER issuance and the market where CER are exchanged.<sup>263</sup> In particular, the lack of transparency affects the primary market. Price discovery mechanisms do not function properly because investors have a difficult time obtaining relevant information and, consequently, prices are generally too low in the primary market. More transparent practices could help market participants agree on fairer prices, thereby rewarding project developers in a more satisfying way.

Obviously, a link exists between the prices in the primary and secondary markets. Spreads reflect the enhanced risks taken in the primary CDM market. If

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258. See generally *Emission Trading*, *supra* note 21, at 12-13 (pointing out tremendous price fluctuations and the lack of sufficient market activity to maintain a certain price stability).

259. Nordseth et al., *supra* note 128, at 17.

260. *Id.* at 18.

261. CAPOOR & AMBROSI, *supra* note 13, at 32.

262. Nordseth et al., *supra* note 128, at 12-13.

263. CAPOOR & AMBROSI, *supra* note 11, at 65.

the market is characterized by a sufficient level of transparency, it is able to adjust prices on its own. For instance, arbitrage opportunities arise when the prices are too high in the secondary market, as the end buyers take advantage of purchasing certificates in the primary market instead. The resulting primary market demand causes the primary market's prices to rise. Consequently, the price difference between the primary and secondary market would merely correspond to the elevated risk premium for the primary market.

From another perspective, the liquidity of the primary CDM market is jeopardized if the CER prices are too low in the secondary CER market. On the one hand, buyers only will 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. Recently, sellers in China have expressly insisted on prices above a certain level to issue primary CER, (at least 8.5-9 Euros) while buyers are not ready to buy CER from the primary market at less than a 2-3 Euros discount.<sup>264</sup> Furthermore, when prices drop in the secondary CER spot market, this phenomenon influences the behaviour of buyers in the primary CDM market.<sup>265</sup> In fact, because the primary market primarily 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.<sup>266</sup> Therefore, the prices in the secondary CER market play a crucial role in ensuring market liquidity. If CER prices are too low, the viability of the whole CDM market may be threatened. Therefore, regulation of the secondary CER market should be aimed at solving these problems, thereby strengthening market stability.

## 5.2 CONCLUSION

In summary, this paper has illustrated how public sector entities, such as regulators and governments, and private sector entities, such as market participants, buyers, suppliers and financial intermediaries, can work together to ensure that the carbon market functions properly. The public sector must provide an adequate regulatory framework and supervision of the CDM market. Further progress must be made in terms of CDM market regulation. The private sector also may facilitate carbon exchanges while trading CER or serve as an intermediary between buyers and sellers and, therefore, contribute to the success of the CDM market. Interactions between the public and the private sectors are thus necessary to accomplish the difficult task of tackling climate change.

The most important challenge, however, concerns regulatory intervention. The UNFCCC provides the means to regulate the primary CDM market. The CDM

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264. *CDM Market Comment*, *supra* note 21, at 2.

265. See CAPOOR & AMBROSI, *supra* note 13, at 2.

266. See *CER buyers*, *supra* note 20, at 1.

Executive Board should make a broader use of its authority over market participants and trading activities. However, the secondary CER market remains unsatisfactorily regulated. Regulatory approaches are composite and incoherent because too many regulators and supervisors are responsible for overseeing the carbon market. It would be more efficient and reasonable to regulate the secondary carbon market comprehensively.

Because the CDM market is young, many issues remain outstanding. Broadly speaking, emission trading seems to be a very promising, as well as a lucrative services sector that deserves particular attention.<sup>267</sup> 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>268</sup> It is especially detrimental to carbon trading that there is regulatory uncertainty about what will happen after the first commitment period under the Kyoto Protocol in 2012. Uncertainties about the future evolution of the Kyoto Protocol have a depressive effect on the level of CDM market activity.<sup>269</sup> Indeed, market participants account for this uncertainty while trading CER. Prior to deciding on the future prospects of the CDM, participating countries must be in a position to evaluate their experiences from the first commitment period.

Important decisions were expected in December 2009 at the United Nations Climate Change Conference in Copenhagen. However, participating countries failed to reach a legally binding agreement, and many countries were disappointed with the modest results of the summit.<sup>270</sup> With respect to the CDM market, decisions were made that could speed up the CER issuance time, yet the longer term outlook remains uncertain.<sup>271</sup> Nevertheless, the Copenhagen Accord is open for signatures from all countries, and there is still hope to mobilize the political will to reach a legally binding treaty in 2010 at the next climate change summit in Mexico.<sup>272</sup> At any rate, the continuation of the CDM seems to be one area of political consensus because more than 50% of CER generated under the CDM will be delivered after 2012.<sup>273</sup> Many developing countries benefit from this mechanism, which will most likely continue to play an important role post-2012. In the long run, the greatest challenge will be how to impose emission reduction targets on the "Big 5" emitters, namely the rapidly industrializing countries: China, India, Brazil, South Africa, and Mexico.<sup>274</sup>

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267. Delimatsis, *supra* note 234, at 447.

268. Humphrey, *supra* note 32, at 86.

269. *Id.* at 88.

270. See Henry Derwent, *Copenhagen: Opportunities missed, but direction a little clearer*, CDM & JI MONITOR, Dec. 23, 2009, at 7.

271. Point Carbon, *Developers win right of appeal at UN talks*, CDM & JI MONITOR, Dec. 23, 2009, at 1.

272. Associated Press, *UN urges all countries to sign climate accord*, OTAGO DAILY TIMES ONLINE, Dec. 22, 2009, <http://www.odt.co.nz/news/world/87039/un-urges-all-countries-sign-climate-accord>.

273. Orlando et al., *supra* note 70, at 75.

274. Weber, *supra* note 70, at 489-90; Orlando et al., *supra* note 70, at 74.

## GLOSSARY

CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
DNA	Designated National Authority(ies)
DOE	Designated Operational Entity(ies)
ECX	European Climate Exchange
EEX	European Energy Exchange
ERPA	Emission Reduction Purchase Agreement(s)
EU ETS	European Emission Trading Scheme
EUA	European Union Allowance(s)
GHG	Greenhouse Gas Emission(s)
gCER	guaranteed Certified Emission Reduction(s)
ICE	IntercontinentalExchange
MiFID	Markets in Financial Instruments Directive
OTC	Over-the-counter
PCF	Prototype Carbon Fund
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified Emission Reduction(s)
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit(s)