

The CDM

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Abstract

The future of the Clean Development Mechanism (CDM) is in doubt. News over possible fraud involving HFC-23 destruction projects has questioned the legitimacy of many offsets. In addition, the expiration of Kyoto's first commitment period at the end of 2012 leaves many questions about the future of the CDM unresolved. To survive, the UNFCCC must adapt the CDM to the world's emerging carbon markets by improving the quality of its CERs and adjust demand to keep the price per CER at an economically viable level. If the price per CER is depressed then investment in new CDM projects will wane. To adapt to the shifting marketplace, the CDM should transition away from CERs created by industrial gas projects, such as HFC-23, to an offset scheme that relies on the forestry sector. Unfortunately, the EU European Trading Scheme (EU ETS), the world's largest carbon market, currently allows HFC-23 CERs but it does not allow forestry CERs. However, other emerging carbon markets have endorsed the use of forestry offsets in their schemes. The possibility of increasing demand from these emerging markets could provide the added incentive for increased forestry investment. If the EU ETS substantially reduces its importation of CDM offsets, then these newer carbon markets could make up for some of the lost demand. Removing HFC-23 projects from the CDM would reduce the supply of questionable CERs while a corresponding increase in the supply of forestry CERs could meet new demand from emerging carbon markets. While the CDM's viability post-2012 is in doubt, there is no question that it has been successful in spurring investment in the developing world. Therefore, the CDM *should* have an important role to play in the Kyoto Protocol's second commitment period.

Introduction

The Kyoto Protocol to the United Nations Framework Convention on Climate Change's (Kyoto Protocol) first commitment period ends in 2012 and many questions remain as to how its second commitment period will be framed. Significant issues from setting emissions targets and how to verify emissions reductions remain. This uncertainty has placed the future of the Clean Development Mechanism (CDM) in question. The CDM is a key part of the Kyoto Protocol's effort to promote sustainable development. It is one of the flexibility mechanisms in the Kyoto Protocol;¹ it allows countries to meet their emission goals by trading carbon offsets with other countries. Unlike the other flexibility mechanisms, the CDM promotes sustainable development in developing countries —precisely where the need for sustainable development is most acute.

Article 12 of the Kyoto Protocol describes the purpose of the CDM:

The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.²

This mechanism was designed to bridge the divide between the wealthy developed countries (Annex I) and poorer developing countries. These developing countries felt that developed countries were the main cause of anthropogenic greenhouse gas (GHG) emissions and that their future growth should not be limited by adopting emission goals. In consideration of these issues,

¹ Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 UNTS 162. [hereinafter Kyoto Protocol] (The CDM is found in Art. 12 of the Kyoto Protocol; the other two flexibility mechanisms are Joint Implementation — found in Article 6, and International Emissions Trading — found in Article 17).

² Kyoto Protocol, *supra* note 1, Art. 12.

the CDM was created to promote sustainable development in developing countries. It has been very successful; massive investments in the developing world have resulted from the CDM's implementation. However, the Kyoto Protocol's and the CDM's future is very uncertain. In addition to uncertainty surrounding the expiration of the first commitment period, concerns over possible fraud perpetrated using the CDM have added to doubts that its goal of sustainable development is being furthered. To understand how the CDM will adapt to post-2012 frameworks, it is necessary to understand its history. Future modifications to the Kyoto Protocol must keep the founding goals of the CDM squarely in mind.

The CDM

As mentioned above, the CDM was one of the flexibility mechanisms created in the Kyoto Protocol. The genesis of the CDM is traced back to the idea of sustainable development.³ This concept gained popularity after the World Commission of Environment and Development published *Our Common Future*, more often known as "The Brundtland Report."⁴ It defined sustainable development as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."⁵ To achieve sustainable development, the Brundtland Report made a list of recommendations that, if implemented, could help achieve these lofty goals. These included strengthening international cooperation and promoting technology transfer in an effort to ensure that all countries could participate in sustainable development.⁶ These two recommendations formed the framework of the CDM.

³ United Nations Framework Convention on Climate Change, Art. 4, Para. 1(c)-(d), May 9, 1992, S. TREATY DOC. NO. 102-38 (1992), 1771 UNTS 107 [hereinafter UNFCCC] (Parties agree to promote technology transfers and sustainable development).

⁴ WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* (1987) [hereinafter *OUR COMMON FUTURE*].

⁵ *OUR COMMON FUTURE*, *supra* note 4, at 43.

⁶ *OUR COMMON FUTURE*, *supra* note 4, at 364-66.

As the world prepared for the Rio Convention it was apparent that one the biggest divides was between wealthy developed countries and poorer developing countries. While the Brundtland Report's view of sustainable development looked towards future generations, developing countries felt that there existed a real need in the present. Their contention was that the weight of responsibility fell on developed countries; the debt owed should be owed to both future generations *and* developing countries.

At the Rio Conference in Brazil, the two sides agreed to the non-binding Rio Declaration; it declared twenty-seven principles to achieve sustainable development.⁷ The developing world bargained for special status in the Rio Declaration.⁸ This status acknowledged the idea of common but differentiated responsibilities and that the burden of achieving sustainable development would fall disproportionately on developed countries.⁹ With this admission by developed countries, the Rio Declaration called for cooperation between *all* countries in promoting sustainable development.

In addition to the Rio Declaration, the Rio Convention also produced the United Nations Framework Convention on Climate Change (UNFCCC).¹⁰ This was a landmark document that focused on how to combat the increasing levels of carbon dioxide in the atmosphere.¹¹ In creating a framework for solving climate change, the UNFCCC created divisions between the

⁷ Report of the U.N. Conf. On Environment and Development: Rio Declaration on Environmental and Development, U.N. GAOR, 47th Sess., Annex I, Vol. I, at 8, U.N. Doc. A/Conf. 151/26 (1992) [hereinafter Rio Declaration].

⁸ Rio Declaration, *supra* note 7, Principle 6.

⁹ Rio Declaration, *supra* note 7, Principle 6 (the least developed countries “shall be given special priority”); Principle 7 (the developed countries acknowledge the responsibility they bear in the international pursuit of sustainable development); *see also* United Nations Framework Convention on Climate Change, Introduction. (“[n]oting that the largest share of historical and current global emissions of greenhouse gasses has originated in developed countries”).

¹⁰ UNFCCC, *supra* note 3.

¹¹ UNFCCC, *supra* note 3, Art. 2.

world's countries: Annex I countries; Annex II countries; and developing countries.¹² The UNFCCC also called for annual conference of parties (COP) where emissions goals would be set.¹³ The third of these COPs was held in Kyoto, Japan and produced the Kyoto Protocol. Article 12 of the Kyoto Protocol defines the CDM and generally explains its mechanics.¹⁴ It embodies the idea sustainable development for *intra*-generational equality.

The CDM is a result of the developed world realizing that if developing countries implemented old or inefficient technology, developing countries would create a carbon infrastructure that would exacerbate the problem of reducing GHG emissions. The CDM recognizes that incentivizing developed countries to invest in the infrastructure of developing countries is the key to achieving sustainable development.¹⁵

The CDM in Action

The CDM is designed to allow Annex I countries meet their emission goals by purchasing Certified Emission Reductions (CERs) to offset any excess GHG emissions within their territory.¹⁶ This in theory would make Annex I countries carbon neutral. It also creates a

¹² UNFCCC, *supra* note 3, Art. 4; *see also* UNFCCC Art. 3 (noting that developed and developing countries have common but differentiated responsibilities).

¹³ UNFCCC, *supra* note 3, Art. 4, Para. 2(b), (d).

¹⁴ Kyoto Protocol, *supra* note 1, Art. 12.

¹⁵ Kyoto Protocol, *supra* note 1, Art. 12, Para. 3(b) (noting the mutual benefit that Annex I and Non-Annex I countries receive from the CDM).

¹⁶ Kyoto Protocol, *supra* note 1, Art. 12, Para. 3(b). (Each Annex I country is given a set amount of GHG emissions; when the prescribed amount is exceeded, it must be offset through purchase of offsets, such as CERs, or Emission Reduction Units (ERUs) from Joint Implementation programs).

*It is important to note that CERs are not just produced by reducing CO₂ emissions, but also reducing other GHG emissions. Examples include N₂O, CH₄, ozone, and hydrofluorocarbons (HFCs). Each type of GHG is made equivalent to CO₂ using a factor called Global Warming Potential (GWP). This quantifies the relative contribution of each GHG to global warming. By definition CO₂ has a GWP of 1. CH₄ has a GWP of 21 and HFCs range in GWP from 1,300 to 11,700. This means that reductions in GHG other than CO₂ can produce many more CERs. Intergovernmental Panel on Climate Change, Appendix XI: Glossary of Terms. Available at: <http://www.ipcc.ch/ipccreports/sres/emission/index.php?idp=168>

demand for CERs may be purchased by Annex I countries. This economic incentive has spurred development in non-Annex I countries.

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Comment: Revise for clarity

On October 20, 2005, the first ever CERs were issued under the Kyoto Protocol.¹⁷ These were created by partnerships between Honduras, Finland and Italy in which two hydroelectric projects were built.¹⁸ These two projects were expected to create ~55,000 CERs each year.¹⁹ The value of each CER provides additional incentives for investors to build CDM projects. This allows the goals of the UNFCCC to be met — GHG emissions in developing countries are reduced and clean technology is transferred.

A CDM process is complicated — it can take years to go from the project idea to the start-up of the project and issuance of CERs. It starts easily enough; someone, whether it is a host country, a private enterprise, or an investment group, comes up with the idea of building of a CDM project in a developing country. To qualify as a CDM project, it should further sustainable development by implementing environmentally sound technology; for example, a wind farm in China.²⁰ Since the existing technology in developing countries is often inefficient and creates excessive amounts of GHG emissions, the CDM incentivizes developed countries to transfer of more efficient (and more expensive) technologies.²¹ In its simplest terms, the difference in emissions between the old, dirty infrastructure and the new, clean infrastructure is

¹⁷ CDM, *First emission credits issued under the Kyoto Protocol*, Oct. 20 2005. Available at: http://cdm.unfccc.int/CDMNews/issues/issues/1_WJHSF1N67JGAORWII2BKVAI8O74B5A/viewnewsitem.html.

¹⁸ Id.

¹⁹ Id.

²⁰ See Project Design Document, Hebei Chengde Songshan Windfarm Project, p.2 (“The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO2 emissions from electricity generation by fossil fuel power plants that is supplied to North China Power Grid”), available at: <http://cdm.unfccc.int/UserManagement/FileStorage/3B6TC61ZNOY7699WM2426MC55WPJOS> [hereinafter Wind Farm PDD].

²¹ In China the main source of electricity is fossil fuel power plants; energy produced from a wind farm reduces demand from these power plants, thus reducing emissions.

the amount of carbon offsets that each project produces. The reduced GHG emissions produce CERs, which can then be sold for an additional profit on top any profits that are generated by the project itself. The additional capital produced by selling CERs *could* be the difference between a profitable and an unprofitable project.²²

While the concept sounds simple enough, the devil is in the details. The difficult part is quantifying exactly how many tons of carbon dioxide each CDM project stops from being emitted into the atmosphere. This is mostly because it is difficult to correctly establish baseline emissions before each project begins. This is the problem of additionality — it is the key variable in establishing a CDM project and setting a baseline. The Chinese wind farm’s additionality is calculated by how many tons of GHG would have been emitted if the electricity were provided by a fossil fuel power plant.²³ This is a fairly basic calculation, which by necessity must make some assumptions. For example, the GHG emissions reductions are calculated using a baseline that assumes China will continue to build coal power plant after coal power plant, never considering using wind power without the added incentives of provided by the CDM. However, it is unlikely that this baseline is 100% correct, as China would presumably bear the cost of reducing its GHG emissions eventually — perhaps by building renewable energy facilities without the incentives of the CDM.²⁴ While the baseline for the Chinese wind farm may not be

²² Det Norske Veritas, *Validation Report, Hebei Chengde Songshan Wind Farm Project in China*, Report No. 2006-2173, p. 12, (“In China an IRR of 8 % for the total investment of a project is regarded as a benchmark for investments in hydropower plants, fossil fuel fired plants and wind farm projects. Based on the data in the feasibility study report, the [wind farm’s] IRR without CER revenues is 6.68 %, which confirms that the project in the absence of CDM benefits is *not financially attractive* compared to the benchmark rate.” (emphasis added)), available at: <http://cdm.unfccc.int/UserManagement/FileStorage/0IPVLD9DTP1HE0PMYHG2DRT7X5MJNW>.

²³ Wind Farm PDD, *supra* note 20, p. 2.

²⁴ See, David Fogarty, *China Renewables to Power Ahead Without CDM*, REUTERS, Aug 20, 2010 (noting that concerns over the post-2012 viability of the CDM have caused renewable energy projects to be implemented in China without the added benefit of the CDM. This also shows that the assumptions of additionality for a Chinese wind farm may not always be accurate, as the assumption that China will

perfect, the assumption made is not completely unreasonable. China's thirst for electricity makes the business-as-usual estimation fairly exact and allows for accurate measurements for issuing CERs. The additionality of a wind farm, in the eyes of the UNFCCC and CDM EB, is certain — and the CDM strives for certainty. It is important to note that the idea of the business-as-usual approach for setting a baseline incentivizes foreign governments to produce excess emissions before the baseline is set, thereby creating more CERs and a more profitable CDM project.²⁵

The complexity of the CDM is an effort to guarantee that each CER is verified as removing one ton of carbon equivalents from the atmosphere. This complexity makes the CDM process expensive and time consuming. Each CDM project begins with a Project Design Document (PDD). The PDD details important facts about the proposed CDM project, such as:

the methodology used to calculate the baseline level of emissions for the project site, an explanation of how the proposed activity would cut greenhouse gases from that business-as-usual scenario, the length, crediting period, and boundaries of the project, and an environmental impacts assessment.²⁶

Once the PDD is finalized a Designated Operational Entity (DOE) reviews it.²⁷ DOEs are independent firms that verify the findings of the PDD, and if they are satisfied, they will submit a validation report.²⁸ Each host country has its Designated National Authority (DNA) confirm that the project is desired and aids in achieving the host country's goal of sustainable development.²⁹

continue to start coal fired power plants instead of renewables is not completely accurate.) available at: <http://in.reuters.com/article/idINIndia-50960420100820>.

²⁵ An example of the perverse incentives created by the CDM can be seen in our Chinese wind farm CDM project. CERs were issued due to reductions of emissions at fossil fuel power plants on the North China Power Grid. This means that China has benefitted by setting its baseline, or business-as-usual approach, at an excessive level of GHG emissions. CDM projects will generate more profit from CERs if the business-as-usual approach causes more GHG emissions.

²⁶ Michael L. Brown, Note, *Limiting Corrupt Incentives in a Global REDD Regime*, 37 *ECOLOGY L. Q.* 237, 244.

²⁷ Michael L. Brown, *supra* note 26, at 244-45.

²⁸ Michael L. Brown, *supra* note 26, at 245.

²⁹ Michael L. Brown, *supra* note 26, at 245. The requirement that CDM projects promote sustainable development is a difficult standard to quantify, as the definition of sustainable development itself is hard

Once the DOE and DNA approve the project, the CDM Executive Board (EB) decides whether or not to give final approval.³⁰ The DOE continually monitors the project to ensure that the PDD is implemented and then submits a certification report verifying the GHG emissions reductions.³¹ The CERs are then issued by the EB unless there are suspicions of any “fraud, malfeasance or incompetence.”³²

Once a project has been approved by the EB and the certification of CERs has commenced, it is important to understand how the CERs are delivered to Annex I countries. There are two main types of CERs that are being purchased by Annex I countries. These are primary CERs (pCERs) and secondary CERs (sCERs).³³ The difference between the two is that “[pCERs] have a delivery risk while [sCERs] are already generated and issued by the CDM [EB] and are hence risk free.”³⁴ The reason for the delivery risk associated with pCERs is that these CERs are contracted for before the project begins and unknown future events could jeopardize their delivery. The risks inherent in contracting for pCERs arise from many different factors; these include: delivery risk, timing risk, counter-party credit risk, country risk and currency risk.³⁵ These risks allow companies to contract for pCERs at a price that is cheaper than sCERs currently available on the market. Upon delivery purchasers can use them to meet their own

to conceptualize. This ambiguity may lead DNAs approving projects that do not further sustainable development.

³⁰ Michael L. Brown, *supra* note 26, at 245.

³¹ Michael L. Brown, *supra* note 26, at 245.

³² Michael L. Brown, *supra* note 26, at 245.

³³ Point Carbon, *Point Carbon’s Primary CER Price Assessment Provides Detailed Insight for CDM Investors*, Nov. 20, 2008, available at: <http://www.pointcarbon.com/aboutus/pressroom/pressreleases/1.1007881>.

³⁴ *Id.*

³⁵ United Nations Development Programme, *The Clean Development Mechanism: A User’s Guide, Chapter 6 – CDM Transactions: A Review of Options*, p. 1, available at: www.undp.org/energy/docs/cdmchapter6.pdf.

emissions goals, or sell them for a profit on the market. In 2009, the pCER market accounted for \$6.5 billion of carbon offsets under the CDM.³⁶

The key variable in the pCER market is what's known as the Chinese price floor. This is the minimum price that a Chinese CDM project will contract to sell its pCERs for. Since China has the lion's share of CDM projects, the Chinese price floor acts as a de facto market indicator for the price of pCERs.³⁷ As with all pCERs, there is a discount for the risk of non-delivery. Since sCERs have no risk, they act as a cap for the price of pCERs. As the price gap between pCERs and sCERs closes, there is little incentive to buy pCERs when the no-risk sCERs are available for almost the same price on the open market. This has led to the Chinese government to adjust its price floor as the price of sCERs in the carbon markets fluctuates.³⁸ Unlike pCERs, sCERs are fungible, certified emissions reductions that can be used immediately as offsets or can be traded in the carbon markets. It is important to keep the distinction between the two as sCERs rely on the world's carbon markets, whereas pCERs do not.

Types of CDM Projects

CDM projects are wildly diverse, not only in location, but type. Examples include: a wind farm in China,³⁹ a gas recovery facility in Nigeria,⁴⁰ and a reforestation project in

³⁶ REUTERS, *Primary CER Carbon Prices Near 6 Mth Low: Analysts*, Nov. 30, 2009, available at: <http://www.reuters.com/article/idUSTRE5AT36920091130>.

³⁷ Carbon Finance, *Cost-Effectiveness of CDM projects*, Nov. 18, 2008 available at: <http://www.carbon-financeonline.com/index.cfm?section=cdmjianalysis&action=view&id=11663>.

³⁸ Point Carbon, *Point Carbon's primary CER price assessment provides detailed insight for CDM investors*, Nov. 20, 2008, *supra* note 33.

³⁹ Det Norske Veritas, *Validation Report, Hebei Chengde Songshan Wind Farm Project in China*, Report No. 2006-2173, *supra* note 22, p. 5-6. Project expected to reduce emissions, by 106,000 tCO₂e. Wind farm with 66 turbines with a generation capacity of 49.5MW. The project is expected to generate 103,000 MWh electricity per year to North China Power Grid based on the power purchase agreement (PPA).

⁴⁰ See CDM – Executive Board, *Monitoring Report for CDM Project No. 0553, Recovery of associated gas that would otherwise be flared at Kwale oil-gas processing plant, Nigeria*, Sep. 10, 2010, p. 3. (reduced GHG emissions by 1,747,226 tCO₂. This CDM problem is interesting because many of the CERs generated are from capturing industrial gases), available at:

Vietnam.⁴¹ There are currently 2,461 registered CDM projects in 69 countries, however 75% of these are located in only four countries — China (40.67%), India (22.23%), Brazil (7.27%), and Mexico (5.00%).⁴² All these CDM projects are estimated to produce ~390 million CERs annually, of which China produces the majority of them (61%).⁴³

HFC-23 Destruction Projects

HFC-23 destruction projects have been extremely controversial within the CDM. These projects reduce GHG emissions by eliminating HFC-23, a byproduct of HCFC-22 production. HCFC-22 is a refrigerant that is produced in an effort to eliminate the use of CFCs, which were banned because they deplete the ozone layer.⁴⁴ Since HCFC-22 is less damaging, its use has been increased in an effort to minimize the use of CFCs.⁴⁵ However this transition is not without its drawbacks. While CFCs are more damaging to the ozone layer than HCFC-22, HCFC-22 and its by-product HFC-23, have high GWP factors. In essence, the efforts to combat ozone layer

<http://cdm.unfccc.int/UserManagement/FileStorage/5B4VENXRU6ZPK1HS9CIDJ0YLMGA8QT>.

⁴¹ See CDM – Executive Board, Cao Phong Reforestation Project. Projected to reduce emissions by 2,665 tCO₂e. The project has 3 goals: “(a) rehabilitation of degraded land and improve land productivity and environmental condition through reforestation, (b) reduction of carbon dioxide in the atmosphere by sequestration of carbon in forest carbon pools, and (c) income increase of local people by timber production and sales of carbon credits.” This provided the local villagers with dual-income streams: (1) profit from selling CERs and (2) profit from selling harvested trees on a 15-year cycle. In return they maintain and protect the reforestation project, and divide the profits with the Forest Development Fund. The project is projected to remove 42,645 tCO₂ over 16 years. Small Scale A/R Validation Report, Cao Phong Reforestation Project. p. 20 [hereinafter Cao Phong Reforestation Project] available at:

http://docs.google.com/viewer?a=v&q=cache:TQWapEMoB_QJ:cdm.unfccc.int/UserManagement/FileStorage/TW8CUAKE5B7PSH24JFVQ1MLDNYOXI9+JACO+draft+validation+report&hl=en&gl=us&pid=bl&srcid=ADGEESHIAmkarNijhdMDz_XDJmhDvVS7jMyhEjN2itj7zNTFWxgEsL5Bo3II_t4TxxnmaLqfCrXojgBX_SHkGFLgSXsoKqcx596qxPBtQkd6sRwrFn_Dy2aQqhDtajBIIUUbpfwQn4eb&sig=AHIEtbT2cB7PfkTP1REu_dIMxoCp9kKCRg.

⁴² CDM, Registration, available at:

<http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html>.

⁴³ CDM, Registration, available at:

<http://cdm.unfccc.int/Statistics/Registration/AmountOfReductRegisteredProjPieChart.html>.

⁴⁴ Montreal Protocol on Substance That Deplete the Ozone Layer, 26 ILM 1541 (1987), [hereinafter Montreal Protocol].

⁴⁵ The use of HCFC-22 will also be phased out as better refrigerants come into the market. See EPA, *Joint Amendment Proposal from the U.S., Canada, and Mexico to the Montreal Protocol to Phase-Down HFCs Montreal Protocol*, available at: <http://www.epa.gov/ozone/intpol/mpagreement.html> [hereinafter EPA].

depletion have caused other refrigerants to be used that exacerbate the effects of global warming!

HFC-23 has a GWP of 11,700, meaning that one ton of destroyed HFC-23 creates 11,700 CERs. This has caused these projects to become extremely profitable as the cost of eliminating HFC-23 has been estimated to be as low as €0.17 per tonne of CO₂-eq.⁴⁶ Considering that CERs can be sold at significantly higher prices, the profitability of HFC-23 projects is enormous. This has created perverse incentives to produce more HCFC-22 at these CDM facilities so that its byproduct, HFC-23, can be destroyed.

To fully comprehend the issue, it is important to realize how substantial an effect these projects have on the CDM overall. At present, HFC-23 destruction projects are only allowed into the CDM if they “have an operating history of at least three years between January 2000 and end of December 2004.”⁴⁷ This limitation has allowed only 19 CDM projects to be registered as HFC-23 destruction projects; “11 are in China, five in India, and one each in Argentina, Mexico and the Republic of Korea.”⁴⁸ Although there are only 19 of these projects “they account for 214 million of the 407 million tonnes of credits issued (52.6%).”⁴⁹ The fact that CERs created by these projects account for such a large share of the CER pie has raised concerns that these projects do not contribute to the CDM’s goal of sustainable development, or even worse, that they could undermine the entire framework of the CDM and the carbon markets.

The Montreal Protocol plans to phase-out the production of HCFC-22 and therefore, reduces emissions of its byproduct HFC-23.⁵⁰ This presents a conflict between the Montreal Protocol and the Kyoto Protocol — the profitability of HFC-23 destruction projects does not

⁴⁶ Environmental Investigation Agency, Policy Briefing, HFC-23 Offsets in the Context of the EU Emissions Trading; available at: www.eia-international.org/files/reports199-1.pdf [hereinafter EIA].

⁴⁷ EIA, *supra* note 46, p.2

⁴⁸ EIA, *supra* note 46, p.2

⁴⁹ EIA, *supra* note 46, p.2 citing: www.unepisoe.org CDM Pipeline overview accessed 25th May 2010.

⁵⁰ EPA, *supra* note 45; *see also* EPA, HCFC Phaseout Schedule <http://www.epa.gov/ozone/title6/phaseout/hcfc.html>.

incentivize the reduction in HCFC use. Since HCFC-22 production must be reduced, the incentives created by the Kyoto Protocol will cause newer, more efficient HCFC-22 production facilities to be shut down in favor of the continuing production at older, less efficient CDM facilities.⁵¹ These older plants may have higher HFC-23/HCFC-22 ratios, and therefore are not as efficient at reducing HFC-23 production as newer production facilities.⁵² But the economic incentives produced by the CDM have caused these older plants to continue production — they are simply too profitable to shut down. To resolve these issues, it is imperative that post-2012 framework for the CDM addresses the issues of HFC-23 projects and the perverse incentives that are created.

In 2010, the details of these HFC-23 destruction projects came into focus. This news raised concerns that the CDM has been ineffective and that it could undermine the entire CDM program, especially looking beyond 2012. If Annex I countries are allowed to purchase offsets from developing countries, but the offsets are not really reductions in GHG emissions, then the CDM is merely allowing industrialized nations to continue increasing emissions with no real reductions in the developing world. This perception could spell disaster, as any doubt to the validity of CERs cuts to the heart of the CDM.

In response to these criticisms, the UNFCCC has considered removing HFC-23 destruction projects from the CDM.⁵³ Considering that 52% of all CERs were created by these HFC-23 projects, the banning of these types of CERs from HFC-23 projects could have major repercussions. Not least of these repercussions is that HCFC-22 producers would lose any economic incentive to destroy the harmful byproduct. However, issues involving these types of

⁵¹ EIA, *supra* note 46.

⁵² EIA, *supra* note 46.

⁵³ EURACTIV, *UN halts carbon credits to Chinese HFC plants*, Aug. 23, 2010, available at: <http://www.euractiv.com/en/climate-environment/un-halts-carbon-credits-chinese-hfc-plants-news-497070>.

gases should be resolved using the Montreal Protocol, as this treaty is specifically focused on the harms of these types of gases. This would also remove the competing incentives created by the interaction between the Kyoto and Montreal Protocols. Unfortunately, it appears that issuance of CERs from HFC-23 destruction projects by the CDM EB will continue for the foreseeable future.⁵⁴

Afforestation, Reforestation and Deforestation

The value of forests in the carbon equation has not been forgotten — afforestation and reforestation (A/R) projects have been included in the CDM and have been producing CERs since 2007.⁵⁵ However, including avoided deforestation in the CDM has taken more time to finalize because there are issues surrounding additionality, leakage, and implementation. These programs recognize the large impact that the world's forests have on the atmospheric CO₂ levels. The genesis of these forestry projects can be found in the UNFCCC, Article 4(d). It says countries shall:

Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems.⁵⁶

The UNFCCC defines sink as: “any process, activity or mechanism which removes a greenhouse gas . . . from the atmosphere,” and reservoir as: “a component or components of the climate system where a greenhouse gas . . . is stored.”⁵⁷ The estimated four billion hectares of forest

⁵⁴ REUTERS, *U.N. Does Not Rule Out More HFC-23 Offset Issuance*, Nov. 18, 2010, available at: <http://in.reuters.com/article/idINIndia-53000420101118>.

⁵⁵ Carbon Positive, *World Bank pays \$4 for forest CERs*, Oct. 22, 2010, available at: <http://www.carbonpositive.net/viewarticle.aspx?articleID=2152>; see also Cao Phong Reforestation Project, *supra* note 41.

⁵⁶ UNFCCC, *supra* note 3, Art. 4(d).

⁵⁷ UNFCCC, *supra* note 3, Art. 1, Para. 8.

store ~638 gigatonnes of carbon and absorb much of the world's carbon dioxide emissions.⁵⁸

Article 3.3 of the Kyoto Protocol also recognizes the importance of deforestation in efforts to reduce carbon dioxide level in the atmosphere:

The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.⁵⁹

This meant that the Kyoto Protocol considered that forestry management could be a variable in each countries carbon equation. This could help many countries meet their emission goals by planting and conserving forests. However, immediately preceding Article 3.3 in the Kyoto Protocol is Article 3.4. It concedes that the methodology for calculating carbon savings from afforestation, reforestation, and deforestation is not yet practicable, but calls for future COPs to confront these issues.⁶⁰ This uncertainty has delayed efforts to include these valuable sinks in meeting emissions goals.

The UNFCCC eventually addressed the challenges of quantifying the carbon savings because of afforestation, reforestation, and deforestation. How land use, land use change and forestry (LULUCF) activity affects each countries emissions was addressed in July 2001. The result, the Bonn Agreement, walked a fine line between allowing too many LULUCF credits to

⁵⁸ UN-DESA Policy Brief No. 16, *Forests: the Green and REDD of Climate Change*, p.1, (Apr. 2009) available at: www.un.org/esa/policy/policybriefs/policybrief16.pdf.

⁵⁹ Kyoto Protocol, *supra* note 1, Art. 3, Para 3.

⁶⁰ Kyoto Protocol, *supra* note 1, Art. 3, Para. 4 (“The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I”).

be created while recognizing the impact of forestry in the world's carbon emissions.⁶¹ It limited the amount of offsets available from LULUCF projects; appendix Z to the Bonn Agreement capped the amount of credit a country can receive to 54 million tons of carbon equivalents.⁶² Most important for this discussion is Section 7 of the Bonn Agreement — it allows LULUCF to be implemented in the CDM; however only afforestation and reforestation projects were permitted to create CERs.⁶³

The Bonn Agreement contemplated that afforestation and reforestation projects would be able to product CERs; however, the inability for avoided deforestation projects to create CERs is conspicuous. Developing countries with large forest areas need access to the carbon market to allow CERs to be created by reducing emissions from deforestation. If reducing deforestation is not incentivized, some developing countries will continue to deforest on a massive scale, as the profitability of the deforested land is much higher for local populations.⁶⁴ This was one of the major issues debated at the COP in Copenhagen, December 2009. This resulted in REDD

⁶¹ It is estimated that GHG emissions from forestry account for 18% of the world's emissions. Carbon Planet White Paper: Vivienne Holloway and Esteban Giandomenico, *The History of REDD Policy*, CARBON PLANET, p. 3, Dec. 4 2009, available at: http://www.google.com/url?url=http://unfccc.int/files/methods_science/redd/application/pdf/the_history_of_redd_carbon_planet.pdf&rct=j&sa=U&ei=7UDpTJOzLcP38Aacot3MCQ&ved=0CBYQFjAA&sig2=h3319Y0R73Zjq2v_8hTbEg&q=UNFCCC+history+of+REDD&usg=AFQjCNFjNXvGnWY_IYLleJvzVPiot-R5KA&cad=rja.

⁶² DAVID HUNTER ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 965-67 (3rd ed. 2007) (citing the July 2001 Bonn Agreement, Part VII: Land-Use, Land-Use Change and Forestry).

⁶³ DAVID HUNTER ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY *supra* note 62, at 966.

⁶⁴ An example of this problem can be found in Indonesia. Indonesia has 120.35 million hectares of tropical rainforest but lost 1.8 million hectares a year from 2000 to 2005. The amount of biodiversity in these forests is incredible and an invaluable asset to the world. However, much if this forest is being lost because of increasing demand for land to produce palm oil. The profitability of this crop is driven by demand for its use as a biofuel, especially in Europe. The irony is that deforestation for producing palm oil causes more GHG emissions than the business-as-usual approach (no biofuel in Europe). See Nicole Colbran & Asbjorn Eide, *Exploring How Today's Development Affects Future Generations Around the Globe: In This Issue: Global Food & Agriculture: Biofuel, the Environment, and Food Security: A Global Problem Explored Through a Case Study in Indonesia*, 9 SUSTAINABLE DEV. L. & POL'Y 4 (2008).

(reducing emissions from deforestation and degradation).⁶⁵ This will allow the vast carbon storages in forests to be included in the GHG calculus. As for REDD's inclusion in the CDM, the expiration of Kyoto's first commitment in 2012 could be the opportunity to get avoided deforestation into the CDM. Allowing REDD into the CDM promotes a holistic view of the carbon cycle, a view that realizes the critical importance of carbon sinks — especially high-value tropical rainforests that are in the most danger of being lost to deforestation. It is critical that the economic value of carbon in rainforests be recognized. If the UNFCCC does not include REDD in the post-2012 CDM framework, deforestation will continue, and irreversible damage could occur.

The Carbon Markets

There are numerous carbon markets across the world. For the purposes of this discussion, we will examine the European Union Emission Trading Scheme (EU ETS); and three American trading schemes: the California Climate Action Registry (CCAR), the Regional Greenhouse Gas Initiative (RGGI), and the now defunct Chicago Climate Exchange (CCX). The key variables of each market for this discussion are: the size of the market, how many CERs may be purchased, and the availability of carbon credits from REDD, LULUCF, and other forestry related projects.

The European Union Emission Trading System (EU ETS)

The EU has been the leader in the creation of a viable carbon market.⁶⁶ The EU's commitment to a 20% reduction of emissions by 2020 will ensure that the EU ETS will continue

⁶⁵ Copenhagen Accord, Dec. 18, 2009 P. 6,8,10, available at <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

⁶⁶ European Commission, *EU Emissions Trading: an Open Scheme Promoting Global Innovation To Combat Climate Change*, p.5 Jan. 2005, available at: ec.europa.eu/environment/climat/pdf/emission_trading2_en.pdf.

to be the world's leading carbon market.⁶⁷ The EU ETS is also the largest trading scheme in the world; its implementation is the centerpiece of the EU effort to meet its Kyoto emissions goals. It allows regulated parties⁶⁸ within Europe to purchase emission allowances to offset any excess emissions that may have been incurred. These emission allowances, called EU Allowances units (EUA), are traded on the EU ETS. Each EUA gives the purchaser the right to emit one excess ton of CO₂ a year.⁶⁹ Each regulated party is given a certain amount of allowances each year; when the annual emissions are calculated they are subtracted from the total amount of allowances. If the emitter had reduced emissions below its allowances they can save (or "bank") them or sell them as EUAs on the EU ETS.⁷⁰ This provides the "carrot" to reduce GHG emissions; the "stick" is that an emitter must purchase EUAs to match any excess emissions.

The EU ETS market has proven to be quite flexible; since 2008, Joint Implementation (JI) projects and CDM projects have been trading alongside the EUA.⁷¹ Since they are all certified as one ton of reduced CO₂ equivalents, they are all functionally equal within the EU ETS. The ability to sell CERs within the EU ETS has been extremely profitable for CDM projects. Without access to a liquid market, the production of CERs would have to remain in the primary market, where the offsets are purchased according to contracts at the planning stage of

⁶⁷ BBC NEWS, EU Agrees on Carbon Dioxide Cuts, Mar. 9, 2007, available at: <http://news.bbc.co.uk/2/hi/europe/6432829.stm>.

⁶⁸ The EU ETS covers approximately 10,000 industrial and energy installations in Europe. These installations account for approximately 40% of all the EU's GHG emissions. Other European sectors may be included in future modifications to the EU ETS. EUROPA, *Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System*, Q.1, [hereinafter Europa Q&A] available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/35&format=HTML&aged=0&language=EN&guiLanguage=en>.

⁶⁹ Europa Q&A, *supra* note 68, Q.2.

⁷⁰ Europa Q&A, *supra* note 68, Q.2.

⁷¹ EUROPEAN COMMISSION, *The EU ETS, CDM and the Carbon Market, In-Depth Report for the Thai Mission*, Nov. 2009, p. 24, available at: www.thaieurope.net/ftp/project09/ETS_final.pdf.

CDM projects. This creates an additional incentive to work within the regulatory framework of the EU ETS and gives the EU the power to mold future changes to the CDM.

The EU ETS market varies as any market does. The most obvious factors in the carbon market are the supply of EUAs, and the distribution of allowances to European industries. If the market is flooded by EUAs and the demand has not increased, the trading price will be depressed.⁷² For this reason, the EU regulates the quantity of CERs on the market and the type of CDM projects that have access to EU ETS. These regulations allow the EU to adapt as problems arise. The EU's ability to restrict access to the EU ETS by project type gives it power to dictate which types of CDM projects should be invested in. An example is LULUCF projects; they have been excluded from trading on the EU ETS even though they are currently creating CERs.⁷³ One of the reasons for excluding LULUCF projects from the EU ETS is that they do not create a standard CER, which is a permanent reduction. Instead these projects create temporary CERs (tCERs) and long-term CERs (ICERs). These are not permanent reductions; the offsets expire when the commitment period ends or if the emissions reductions are lost, for example by fire. When these non-permanent CERs expire, the purchaser must repurchase other CERs to make up for the loss of that offset.⁷⁴ This has led to the EU to reject the inclusion of tCERs and ICERs

⁷² A good example of how allowances can affect the market price for EUAs happened in December 2007 as Phase I of the EU ETS expired. Allowances from Phase I could not be carried over, or "banked," to Phase II. Since the Phase I allowances were not set low enough, there was an overabundance of EUAs. This caused the price of EUAs to plummet in late 2007, since there was plenty of EUAs available, but not much demand. "In short, the EU scheme allocated more allowances than emitters needed to cover their emissions." Tim Jordan, *Market Intelligence*, CLIMATE SPECTATOR, Aug. 16, 2010, available at: <http://www.climatespectator.com.au/commentary/emissions-trading-scheme-europe-ets-market-australia>

⁷³ Europa Q&A, *supra* note 68, Q.23.

⁷⁴ The temporary nature of CERs from LULUCF projects and the fact that CERs must be repurchased upon expiration means that the price of a tCER (or ICER) is less than the standard CER traded on the EU ETS. TÜV SÜD INDUSTRIE SERVICE GMBH, *Frequently asked questions on forestry and CDM*, p. 6, available at: http://www.google.com/url?url=http://www.tuev-sued.de/uploads/images/1217329426438151890993/faq_forestry_ar-cdm.pdf&rct=j&sa=U&ei=TYvITLnsBJa7nAf3nMSgDQ&ved=0CBIQFjAA&sig2=V-

because of concerns that the non-permanence of the reductions could undermine the EU ETS.⁷⁵

Other listed concerns for rejecting tCERs and ICERs from LULUCF projects were: leakage problems, risk to purchasers from loss of credits, increases monitoring and reporting, and adding even more complexity to the system.⁷⁶ This has resulted in underinvestment in LULUCF projects; only 17 of these projects have been approved in the CDM accounting for .57% of total number of projects.⁷⁷

The EU has also considered “banning the use of any HFC-related CERs in the [EU ETS].”⁷⁸ The CERs created by HFC-23 projects may not be genuine emissions reduction because of issues relating to additionality and the accusations of fraud involved with these types of projects.⁷⁹ Removing HFC-23 CERs would help maintain the credibility of the EU ETS by ensuring that offsets are real. Allowing European emitters to meet their goals by purchasing HFC-23 “offsets” results in increased GHG emissions — instead of carbon neutrality. The possible removal of HFC-23 destruction products from the EU ETS has already had effects on the price of carbon.⁸⁰ Fears over a supply shortage due to possible removal of HFC-23 projects have driven the price of CERs on the EU ETS up recently.⁸¹ These concerns over HFC-23 CERs were fueled by comments from European Climate Commissioner Connie Hedegaard calling for a

aC3DmjQOpsJDEYYSAqcg&q=Frequently+asked+questions+on+forestry+and+CDM&usg=AFQjCNG KiuCJtS33S48Th-CPROQR1xxe_g&cad=rja.

⁷⁵ Europa Q&A, *supra* note 68, Q.23.

⁷⁶ Europa Q&A, *supra* note 68, Q.23.

⁷⁷ CDM, Registration, available at:

<http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html>.

⁷⁸ James Murray, *Exclusive: Could CDM reforms cripple offset market?* BUSINESS GREEN, Nov. 11, 2010, available at:

<http://www.businessgreen.com/bg/news/1895474/exclusive-cdm-reforms-cripple-offset-market>.

⁷⁹ Miles Austin, *UNCTAD Session 3: Supplying demand post-2012*, ECOSECURITIES GROUP PLC, (Apr. 20 2009) (“The prime candidate technology for being barred from use in the EU ETS are CERs from HFC destruction projects.”), [hereinafter EcoSecurities] available at: www.unctad.org/sections/wcmu/docs/c1em1p06_en.pdf.

⁸⁰ Carbon Positive, *CER prices rise on supply concerns*, Aug. 26, 2010, available at:

<http://www.carbonpositive.net/viewarticle.aspx?articleID=2089>.

⁸¹ *Id.*

“major overhaul” and for “quality restrictions” for industrial gas projects — such as HFC-23 facilities — within the CDM program.⁸² The removal of HFC-23 CERs from the EU ETS could open up opportunities for other types of CDM projects, prompting new investment.⁸³

Another regulatory mechanism of the EU ETS is that only a certain amount of CERs can be traded; Phase II of the EU ETS allows ~270 Mt/yr of credits from CDM and JI projects to be traded comprising 13.4% of the European cap.⁸⁴ This regulatory mechanism allows for the EU ETS to evolve as the market forces change. Any adjustments to the amount of CERs that can be traded on the EU ETS will have a large effect on the future of the CDM, as the availability of a liquid market for the CERs makes many CDM projects economically viable. The EU is considering substantially lowering the amount of CERs that can be traded in Phase III of the EU ETS in an effort to reduce the dependency of foreign carbon credits from outside of the EU.⁸⁵ Limiting the importation of CERs will have a large impact on the CDM, and has been seen as a reversal of the EU’s commitment to the CDM.⁸⁶ This will lower the global demand for CERs substantially and could harm the overall effectiveness of the CDM by lowering the value of CERs.

The effect of EU ETS regulations on the CDM is substantial. As long as the world’s largest market for CERs prohibits certain CDM projects from participating, the incentives to start

⁸² EUROPA, Statement by Commissioner Connie Hedegaard Brussels, Aug. 25 2010, available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/387&format=HTML&aged=0&language=EN&guiLanguage=en>.

⁸³ If 214 million HFC-23 CERs are denied access to the EU ETS, that would leave 193 million CERs produced from other types of CDM projects. Since the EU ETS currently allows ~270 million CERs to be traded annually, this shortage of supply would cause a price increase in CERs which could spur more reinvestment in new CDM projects. This increase in price may be short lived, as demand for CERs in Phase III of the EU ETS will be substantially less than the 270 million CERs currently allowed.

⁸⁴ EUROPEAN COMMISSION, *The EU ETS, CDM and the Carbon Market, In-Depth Report for the Thai Mission*, Nov. 2009, *supra* note 71, p.24.

⁸⁵ EcoSecurities, *supra* note 79, p. 6.

⁸⁶ EcoSecurities, *supra* note 79, p. 5.

the prohibited projects will be minimized. As the price of EUAs and CERs increase, the profitability of CDM projects also increases, but if the EU ETS limits importation of CERs the demand for new CDM projects will be lessened. The void in demand created by new EU ETS limitations may however provide for new opportunities as new carbon markets emerge.

The Regional Greenhouse Gas Initiative (RGGI)

The lack of federal action by the United States government has left a void in the United States GHG emissions arena. This has caused many states to implement their own mandatory cap and trade schemes. Ten Northeastern states agreed to implement a cap and trade system to reduce emissions. RGGI “is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.”⁸⁷ These states plan to reduce CO₂ emissions within the power sector by 10 percent by 2018.⁸⁸ RGGI permits regulated parties to purchase offsets from a variety of emissions reductions projects. These include:

Landfill methane capture and destruction, [r]eduction in emissions of sulfur hexafluoride (SF₆) in the electric power sector, [s]equestration of carbon due to afforestation, [r]eduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency in the building sector, [and] [a]voided methane emissions from agricultural manure management operations[.]⁸⁹

Like the EU ETS, RGGI has developed regulatory requirements for type of offsets that can be used.⁹⁰ “These requirements ensure that awarded CO₂ offset allowances represent CO₂-equivalent emissions reductions or carbon sequestration that is real, additional, verifiable,

⁸⁷ The Regional Greenhouse Gas Initiative (RGGI) CO₂ Budget Trading Program, Program Design, available at: <http://www.rggi.org/design>.

⁸⁸ Id.

⁸⁹ The Regional Greenhouse Gas Initiative (RGGI) CO₂ Budget Trading Program, Offset Categories, available at: <http://www.rggi.org/market/offsets/categories>.

⁹⁰ The Regional Greenhouse Gas Initiative (RGGI) CO₂ Budget Trading Program, CO₂ Offsets, available at: <http://www.rggi.org/market/offsets>.

enforceable, and permanent.”⁹¹ However, unlike the EU ETS, RGGI has limited the scope of carbon offset projects to locations within the RGGI participating states.⁹² This means that CDM projects do not have access to RGGI, but as RGGI evolves, the inclusion of CERs may be possible.

The California Emissions Trading System (CETS)

California has also entered the cap and trade arena with its own market, the California ETS (CETS). In 2006, Governor Schwarzenegger passed the Global Warming Solutions Act of 2006 (AB 32).⁹³ This allowed California to implement a cap and trade system so as to reduce emissions to 1990 level by 2020 — a 25% reduction.⁹⁴ On November 2, 2010 California voters defeated a ballot proposition that would have suspended the law and delayed the cap and trade system. Shortly thereafter the first trades involving carbon credits for California emissions goals were consummated.⁹⁵ The purchases were for carbon futures, similar to pCERs that would be delivered at a price of \$11.50 per metric tonne and could be used to meet emissions limits in 2012.⁹⁶

The CETS, like the RGGI, has widened the scope of projects that can be used to create emissions credits. Offsets will be available from forestry projects, livestock waste management and ozone-depleting gases destruction. California’s Air Resources Board (ARB) has allowed

⁹¹ Id.

⁹² Id.

⁹³ Office of the California Governor, Press Release, *Gov. Schwarzenegger Signs Landmark Legislation to Reduce Greenhouse Gas Emissions*, Sep. 27, 2006, available at: <http://gov.ca.gov/press-release/4111/>.

⁹⁴ Id.

⁹⁵ Jim Efstathiou Jr. and Simon Lomax, *Barclays, NRG Make First California Cap-and-Trade Deal*, BLOOMBERG, Nov. 17, 2010, available at: <http://www.bloomberg.com/news/2010-11-17/nrg-energy-barclays-make-first-california-cap-and-trade-deal.html>.

⁹⁶ Id.

regulated emitters to use offset up to 8% of their emissions with carbon credits.⁹⁷ This means regulated entities will be able to purchase 232 million offset credits from 2012 to 2020.⁹⁸ Unlike RGGI, the CETS contemplates the importation of credits from offset projects in Canada and Mexico. Even more interesting is the possibility that “the ARB will also pursue larger, sector-wide offsetting programs over time, including avoided deforestation, or REDD, in tropical developing countries such as Brazil and Indonesia.”⁹⁹

The Chicago Climate Exchange (CCX)

The CCX is an interesting case study that highlights the need for transparency and quality in offset production. Unlike the EU ETS, RGGI, and CETS, the CCX was a cap and trade system where participants *voluntarily* made legally binding commitments to reduce GHG emissions.¹⁰⁰ Participants were permitted to purchase offsets from various types of projects. However in November 2010, it was announced that the CCX’s voluntary program was being discontinued.¹⁰¹ Since Congress¹⁰² had failed to pass cap and trade legislation, the EPA will regulate GHG

⁹⁷ Carbon Positive, *Forest Carbon Boost in California ETS offset rules*, Nov 2, 2010, available at: <http://www.carbonpositive.net/viewarticle.aspx?articleID=2160>.

⁹⁸ Id.

⁹⁹ Id.

¹⁰⁰ Chicago Climate Exchange, History, available at: <http://www.chicagoclimatex.com/content.jsf?id=1>, (the 13 charter members committing to emissions reductions are: American Electric Power, Baxter International Inc., City of Chicago, DuPont, Ford Motor Co., International Paper, Manitoba Hydro Corp., MeadWestvaco Corp., Motorola Inc., STMicroelectronics Stora Enso North America, Temple-Inland Inc. and Waste Management Inc.; the CCX currently has over 400 members).

¹⁰¹ Tilde Herrera, *Pioneering Cap-and-Trade Program to Fade into the Sunset*, GREENER WORLD MEDIA, P.1, available at: <http://www.reuters.com/article/idUS83245215220101108>.

¹⁰² The Waxman-Markey cap and trade bill (a.k.a. H.R. 2454: American Clean Energy and Security Act of 2009) passed through the house but was never even voted on in the Senate; the bill, for all intents and purposes, is dead. See Richard Cowan and Timothy Gardner, *Scenarios: Climate change options for Congress in 2010*, REUTERS, Jan 25, 2010, available at: <http://www.reuters.com/article/idUSTRE6005EI20100125>.

emissions using existing legislation, thereby obviating the need for a voluntary program.¹⁰³

Another concern with the CCX was the legitimacy of the offsets that were used in the program.¹⁰⁴ The executive director and dean of the Greenhouse Gas Management Institute, Michael Gillenwater, said: "[t]he general perception was that the offset protocols developed by CCX were of the lowest quality out there in the greenhouse gas emissions offset marketplace. That impacts people's perception of the program."¹⁰⁵ This is in contrast to the statements by the CCX regarding offsets: "[e]very GHG mitigation project enrolled in CCX must meet eligibility standards and undergo independent verification before it can be issued tradeable Offsets in the CCX Registry."¹⁰⁶ This experience of the CCX should inform the UNFCCC of how to adjust the CDM post-2012 — it highlights the importance of that offsets be *perceived* as high quality, as well as being *actual* reductions in emissions. The CDM is currently experiencing the same perception and quality issues regarding offsets from HFC-23 projects.

Market Synthesis

The key to sustaining the CDM post-2012 is evaluating the supply and demand for CERs. The availability of emerging American carbon markets may just be the added demand that the CDM needs in order to continue promoting sustainable development in the developing world. This would be an ironic result, as the United States has not participated with the rest of the Annex I nations in using the CDM. But with the EU ETS planning to cut back offsets from the CDM post-2012, this decrease in demand could significantly reduce the value of CERs. The depressed CER market, along with suspicions over HFC-23 CERs, could be the nail in the coffin

¹⁰³ John M. Broder, *E.P.A. Expected to Regulate Carbon Dioxide*, N.Y. TIMES, Feb. 18, 2009, available at: <http://www.nytimes.com/2009/02/19/science/earth/19epa.html>.

¹⁰⁴ Tilde Herrera, *Pioneering Cap-and-Trade Program to Fade into the Sunset*, GREENER WORLD MEDIA, p.2, available at: <http://www.reuters.com/article/idUS83245215220101108?pageNumber=2>.

¹⁰⁵ Tilde Herrera, *supra* note 102.

¹⁰⁶ Chicago Climate Exchange, *FAQs: CCX Offsets*, p.2 (2007), available at: http://www.chicagoclimatex.com/docs/offsets/General_Offsets_faq.pdf.

of the CDM. To help remedy this possible fate, HFC-23 destruction projects must be removed from the program. Unfortunately, it appears that will not happen immediately.¹⁰⁷ However, emerging markets have the power to carefully regulate the source of carbon offsets to protect the integrity of the market. As seen by the HFC-23 fiasco, the issue of integrity is extremely sensitive when dealing with industrial gases. The high GWP of these gases make projects in this sector extremely vulnerable to fraud.

Currently, the most likely American market for CERs is the CETS. The possibility that regulated entities in an American cap and trade system could purchase CERs would be a big showing of confidence in the CDM. The availability of a new market in California — with ~25 million offsets allowed each year — would help ensure demand for CERs post-2012. It is also possible that RGGI could follow California's lead and allowing CERs to be used as offsets in its scheme. Just as the EU ETS has influenced the CDM, so to could American markets. Since both American markets consider LULUCF projects as feasible within their schemes, the UNFCCC and American markets should look to harmonize their LULUCF methodology in order to promote the fungibility of CERS across markets. In addition, the commitment of American *States* to the ideals of the CDM could be a showing of good faith that might catalyze international cooperation.

Recent news suggests that China has a renewable energy policy that is independent of the CDM.¹⁰⁸ This changes many of the baseline analyses of Chinese CDM projects, such as our wind farm, and should encourage a shift away from CDM projects in China. CER production at these projects must taper off to reflect that the true baseline for China included renewable energy projects notwithstanding the CDM. It is hard to argue for the additionality of a renewable energy

¹⁰⁷ REUTERS, *U.N. Does Not Rule Out More HFC-23 Offset Issuance*, Nov. 18, 2010, *supra* note 54.

¹⁰⁸ David Fogarty, *China Renewables to Power Ahead Without CDM*, REUTERS, *supra* note 24.

project for a country that has adopted a renewable energy policy. Eventually, this should lead to the end of CDM projects in China, leading to investment elsewhere.¹⁰⁹ In China's place should be increased CDM development in the least developed countries, focusing on forestry activities.

Conclusion

The CDM is essential for continuing the promotion of sustainable development in the developing world. It is vital the CDM continues past 2012, as its ability to promote sustainable development and to create carbon offsets is unmatched. If new commitments for reducing emissions are not made within the framework of the Kyoto Protocol, it is evident that a market for carbon offsets will endure with or without the CDM. While the EU will limit the importation of CERs in Phase III of the EU ETS, the emergence of new markets, particularly in the United States, could keep CERs in demand. However, it is vital that these markets closely regulate the type of credits that are permitted. If various cap and trade schemes coordinate their actions to refuse acceptance of CERs made from certain projects, say HFC-23 projects, there will be no market for these tainted offsets. This should send a signal to the UNFCCC that these projects do not meet each market's minimum quality for offsets. To replace questionable CDM projects, the UNFCCC should look to increasing the amount of LULUCF and REDD projects. Since both of the functional American markets accept offsets from forestry, the UNFCCC and American markets should adopt similar methodologies to standardize forestry offsets. The American markets could then make up for lost demand from the EU ETS by investing in forestry offsets. The viability of the CDM post-2012 depends on its ability to shift to a new climate regime, while maintaining its core principle of sustainable development.

¹⁰⁹ David Fogarty, *China Renewables to Power Ahead Without CDM*, REUTERS, *supra* note 24.

