Assessing Offset Quality in the Clean Development Mechanism





NOVEMBER 2009

OFFSET QUALITY INITIATIVE

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Introduction

The Clean Development Mechanism (CDM), created under the Kyoto Protocol, generates offsets through investments in greenhouse gas (GHG) reduction, avoidance, and sequestration projects in developing countries (referred to as "non-Annex I Parties"). These offsets, called Certified Emission Reduction credits (CERs), are equivalent to a reduction in one metric ton of carbon dioxide (CO_2)[1] emitted to the atmosphere. Developed countries (referred to as "Annex I Parties") can use CERs to cost-effectively achieve their Kyoto Protocol GHG reduction targets.

Over the past several years, the CDM has been subject to a number of critiques, many of which call into question the program's ability to generate high quality offsets. While the Offset Quality Initiative (OQI) neither endorses nor opposes the CDM, this paper seeks to provide an impartial description of the CDM and analyze its ability to ensure offset quality in the future. Specifically, this paper analyzes the CDM through the prism of the core criteria for offset quality outlined in OQI's white paper titled *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy.* OQI considers the CDM process for addressing each criterion, assesses whether the process is sufficient to ensure quality, responds to related critiques of the CDM, and provides recommendations for improvement where appropriate.

Overall, OQI finds that the CDM's processes perform sufficiently against most of our core offset quality criteria, and with further refinement should be capable of performing sufficiently against all criteria. The most significant quality issues in the CDM historically have had to do with additionality and the reliability of independent third party verification. These issues are common across all GHG offset programs and, in the case of the CDM, can be addressed through streamlining and standardizing the additionality tools and significantly restructuring the third party verification system. On all other criteria, OQI finds that the CDM, with some modification, can sufficiently ensure offset quality.

Key Offset Quality Criteria

OQI's "Offset Policy Design Principles and Recommendations"[2] establishes a set of eight offset quality criteria. Offsets should (1) be additional, (2) be based on a realistic baseline, (3) be accurately quantified and monitored, (4) be independently validated and verified, (5) be unambiguously owned, (6) address leakage, (7) address permanence, and (8) do no net harm.

For each of these criteria, OQI has evaluated the CDM's performance, related critiques, and future ability to satisfy the criteria. The following table summarizes the results of this analysis.

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1 The Kyoto Protocol applies to five other greenhouse gases besides CO_2, each with a different "warming power." So that all the gases can be represented by a common unit, each is converted into a "carbon dioxide equivalent." For example, methane (CH_4) has a global warming potential 21 times that of CO_2 over a 100-year time horizon.

2 Offset Quality Initiative. *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy.* July 2008.

Table: Summary of the CDM's Performance and OQI Recommendations

OQI QUALITY OFFSET CRITERIA	CDM PROCESS	CRITIQUES OF CDM
1. Offsets Should Be Additional	Regulatory, Barrier or Investment, and Common Practice Tests	Does not ensure offset quality • Additionality guidance too subjective and vague; applied inconsistently
2. Offsets Should Be Based on a Realistic Baseline	Transparent/conservative project-specific assessment	Inadequately streamlined; administratively burdensome
3. Offsets Should Be Accurately Quantified & Monitored	Monitoring plan must be included in Project Design Document (PDD)	No significant critiques

OQI FINDINGS	OQI RECOMMENDATIONS
Processes for determining additionality in projects where there are multiple revenue streams should be improved • Valid concerns exist about the design and implementation of measures to ensure additionality • Recent rejection of certain project types indicate improvement in implementing these measures • It is possible to modify the CDM so that it ensures sufficient offset quality, while not also being overly burdensome or administratively complex • It is easier to determine additionality where CDM is the sole/primary source of revenue to the project	Streamline existing process, standardize tools, provide more detailed guidance • For projects with multiple revenue streams, implement a more rigorous and standardized approach to determining additionality • For all projects, provide more detailed guidance to project participants and independent third party project auditors • Provide standardized investment and analysis tools • Develop "hybrid" additionality assessments, which combine elements of the current tests-based approach with more project-type-specific benchmarks, to help balance the strengths and weaknesses of the standardized processes recommended above
Generally sufficient to ensure offset quality • Administrative burden is being reduced where possible, but more streamlining is necessary • Development of benchmark baselines requires a significant amount of data, research, and work to ensure they are current as well as contextually and regionally appropriate	Benchmark baselines in appropriate sectors • Transitioning towards more standardized, benchmarked baselines, where appropriate, would streamline project development and promote administrative efficiency
Generally sufficient to ensure offset quality but could be improved • CDM has strict criteria for emission quantification and monitoring • The CDM predates, and has served as a model for, emission quantification and monitoring under other offset programs	In certain instances, monitoring could be improved by requiring application of recognized technical standards to CDM monitoring plans • Monitoring and quantification requirements must retain some degree of flexibility and diversity across different methodologies • In certain instances, requiring the application of internationally recognized technical standards to CDM monitoring plans could improve data quality • Explicit references to recognized technical specifications and standards will also reduce ambiguity for project participants and auditors

OQI QUALITY OFFSET CRITERIA	CDM PROCESS	CRITIQUES OF CDM
4. Offsets Should Be Independently Validated & Verified	Independent third party auditors called Designated Operational Entities (DOEs) are contracted to validate and verify all projects	To date, DOEs have not sufficiently audited projects due to: • Lack of capacity • Conflicts of interest • Competition
5. Offsets Should Be Unambiguously Owned	Serialization on registry; offset tons issued approved by Designated National Authority (DNA), i.e., the host country	No significant critiques
6. Offsets Should Address Leakage	Project boundary, description, and monitoring of potential leakage required in PDD and deducted from issuable credits	No significant critiques
7. Offsets Should Address Permanence	Temporary credits issued for afforestation/reforestation projects	"Temporary" designation creates investment uncertainty
8. Offsets Should Do No Net Harm	Required public comment period; description of potential environmental/ economic/social impacts in PDD	Some projects do harm; not all projects contribute to CDM goal of promoting sustainable development

OQI FINDINGS	OQI RECOMMENDATIONS
Validation and verification processes should be significantly restructured to ensure offset quality • Procedures for spot checks and periodic evaluation have been taken seriously and oversight of DOEs by the CDM Executive Board is progressing, but still needs improvement • Standardized protocols on the practice of auditing are needed. Adoption of the Validation and Verification Manual (VVM) marks progress in this regard	Align incentive structure, improve training for auditors, and improve CDM Executive Board oversight • Require a mandatory training and testing program for individuals employed by DOEs • Auditors could be assigned to projects instead of selected and contracted by project participants • Train and test DOE accreditation assessors before they evaluate the capabilities of an audit organization • Enhance resources for DOE oversight under the CDM • Continual updates and improvements to the VVM are essential to ensure DOEs, project participants, and the CDM Executive Board have a clear understanding of what is material to the quality of PDD validation and verification
Generally sufficient to ensure quality • The system is structured to respect domestic sovereignty and ensure clear ownership under domestic law, while simultaneously ensuring that international ownership transactions are clear and credible • Serialization and a registry accounting system promote unambiguous ownership by allowing credits to be transferred and retired in a transparent fashion	Improve national-level governance structures through training and capacity-building to help DNAs do an even better job of addressing any ambiguous ownership issues that may occur
Generally sufficient to ensure offset quality but could be improved • Methodologies to estimate leakage are conservative for most project types	Continue to use conservative approach in estimating leakage
Generally sufficient to ensure offset quality, but possibly too stringent • Temporary nature of credits discourages investment in forestry projects	Explore possible alternative approaches to address reversal risk • Decrease use of temporary crediting to encourage investment in forestry projects • Allow for a range of policy mechanisms (e.g., pooled risk in a buffer account, project insurance) to address reversal risk, which will help promote greater certainty and avoid constraining the market
Generally sufficient to ensure offset quality • Trade-offs mean achieving 100% no net harm is difficult in practice • National sustainable development goals can be varied and/or vague • It is difficult to determine whether CDM sufficiently contributes to sustainable development	Various approaches exist to ensure more projects contribute to sustainable development • Improve national-level governance structures through training and capacity-building to help DNAs develop their own sustainable development criteria and evaluation processes • Educate local stakeholders to promote empowerment and understanding of offset projects • Provide clearer guidance on how to meet sustainable development requirements

OQI Criteria #1

Offsets Should Be Additional

Emission reductions resulting from offset projects should be "in addition" to reductions that would have occurred without the incentives provided by the existence of the offset program. To determine if a project is "additional," project developers, auditors, and regulators generally rely on a series of tests, which identify the regulatory, financial, technical, institutional, common practice, and/or other barriers to a project's implementation.

CDM Process for Assuring Additionality

To ensure that offsets are additional, the CDM requires project participants to apply three additionality tests: (1) a Regulatory Test, (2) either a Barrier Test or an Investment Test, and (3) a Common Practice Test. Project participants must apply these tests on a project-by-project basis to assess the unique circumstances of each proposed activity.

The Regulatory Test identifies realistic and credible alternatives to the CDM project that are in compliance with all mandatory and enforceable legal and regulatory requirements, even if those laws and regulations have objectives other than GHG reductions. If the proposed project activity is the only viable alternative, amongst all the practical alternatives that comply with enforced regulations, then the proposed CDM project is not additional.[3]

The Barrier Test examines whether there are hurdles preventing the project's implementation in the absence of the CDM. Barriers must be significant, realistic, credible, conservative, and based on transparent and documented evidence. Examples could include barriers related to securing investment or risk associated with unfamiliar technology.[4] These same barriers must not affect, or must affect less strongly, reasonable alternatives to the project activity.

The Investment Test determines whether a CDM project would occur without offset revenue. In the CDM, project participants typically make investment-related additionality arguments based on the internal rate of return (IRR) of a project, both with and without CER income. If the project activity generates no revenue aside from the sale of CERs, then the project participant applies a simple cost analysis to document project costs and to demonstrate that there is at least one less expensive alternative to the project activity. If the activity *does* generate revenue in addition to CER sales, the project participant must apply either (1) an investment comparison analysis, which uses a project-appropriate financial indicator to compare the project's performance to alternative activities; or (2) a benchmark analysis, which compares a standardized market indicator to the CDM activity. If either analysis indicates that there is a more financially attractive option than undertaking the CDM project, the project passes this test. A Sensitivity Test is also required to ensure that the analytical assumptions used are robust.[5]

Finally, the Common Practice Test measures the sectoral and/or regional penetration of the proposed CDM activity (i.e., technology or practice). If activities similar to the CDM

3 Methodological Tool "Tool for the demonstration and assessment of additionality" Version 05.2 Available at: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf.

4 Ibid.

5 Institute for Global Environmental Strategies. "CDM in Charts, Version 7.0." February 2009.

project activity are common, the project participant must demonstrate that the project-specific circumstances are somehow unique, otherwise, the project is not additional.

If a project fails any of these tests (i.e., it is legally required, is the most economically attractive approach and/or barrier-free, or is common practice) the project is not additional and cannot generate offsets under the CDM.

Critique: The CDM Does Not Adequately Ensure Additionality

A number of past critiques have questioned the effectiveness of these tests, or at least the consistency and adequacy of their application by regulators. Of these, perhaps the most well known critique was the November 2007 paper written by Lambert Schneider on behalf of the World Wildlife Fund, titled *Is the CDM Fulfilling its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement.* The media, academic literature, and trade press cited Schneider's paper widely for its assertion that up to 20% of CERs, representing 40% of CDM projects, may have been non-additional. Schneider's paper also argued that the additionality guidance provided under the CDM with respect to barriers, investment, and common practice tests was too subjective and/or insufficiently specific.

The 2008 paper by Stanford University Professors Michael Wara and David Victor titled *A Realistic Policy on International Carbon Offsets* is another notable critique of the CDM's ability to ensure project additionality. Wara and Victor largely focused their criticism on the applications for CERs made by nearly all new Chinese renewable energy capacity at the time, despite the Chinese government's national policy goals that focused on increasing investment in renewable energy. The implication of their argument was that it would have been impossible for all these projects to meet the CDM's additionality test, since at least some of the renewable energy capacity brought online at the time must have been attributable to China's energy policy, not the CDM. They claimed that if the CDM's additionality tests could not sift out the additional from non-additional projects in this example, then they could not sufficiently ensure offset quality.

Wara and Victor also criticized the concept of offsets in general by asserting that increasingly burdensome tests would be required to sufficiently ensure additionality to an acceptable level of offset quality, and that such stringency would make the CDM too cumbersome to function effectively. Ultimately, they declared that "enthusiasm [for offsets] is misplaced because any offset market of sufficient scale to provide substantial cost-control for a cap-and-trade program will involve substantial issuance of credits that do not represent real emissions reductions."

OQI Findings & Recommendations

Finding(s): OQI finds that there have been valid concerns about the efficacy of both the design and implementation of the CDM's measures to ensure additionality. However, the recent rejection of a number of proposed Chinese renewable energy CDM projects by the Executive Board (EB) (the body responsible for oversight of the CDM) on additionality grounds indicates that CDM executive leadership and staff have begun to address at least some of the aforementioned quality critiques.

Furthermore, OQI believes that issues cited in the past concerning CDM additionality determinations are neither endemic nor irreparable. Improvements in the past few years

include the introduction of both the Registration and Issuance Teams (RITs) and additional secretariat staff that provide multiple layers of project review, summarize submissions, and make recommendations, all of which facilitate the CDM Executive Board's review and decision making process. The Executive Board review and rejection rate for projects has increased significantly over the past two years.[6] As the Executive Board undertakes reforms to incorporate more objective, standardized criteria into additionality determinations, it will be possible to create a program that both ensures offset quality and is not overly burdensome or administratively complex.

Recommendation(s): Broadly speaking, CDM projects fall into one of two categories, which largely dictate how difficult it is to assess their additionality. For projects where CDM is the sole or primary source of revenue, additionality is less challenging to determine since there are no other expected economic incentives for the project besides the CDM.

Projects with multiple revenue streams are more challenging. For this category, the CDM could improve by implementing a more rigorous and standardized approach to determining additionality, consistent with the recommendations made by Lambert Schneider.

Standardized approaches determine additionality based on a set of objective eligibility criteria, which consider the regulatory, financial, institutional, and technical conditions for a particular project type. Generally, standardized approaches involve the establishment of performance benchmarks for both additionality and baselines. However, while a more standardized approach to additionality also can help promote offset quality, an entirely standardized approach would be challenging, if not impossible, because of the diversity of developing country contexts. Therefore, "hybrid" additionality assessments, which combine elements of the current tests-based approach with more project-type-specific standardized criteria, can help balance the strengths and weaknesses of these respective processes. As the CDM grows to meet increased global demand for international offsets, a hybrid approach to additionality can help streamline the project cycle, increasing efficiency while maintaining quality.

Providing more detailed guidance to both project participants and independent third party project auditors (referred to as Designated Operational Entities, or DOEs) about how to determine additionality for each project type, and providing standardized investment and analysis tools, will improve the quality of the CDM while also reducing transaction costs and administrative burden. As the first large-scale GHG offset program in the world, the CDM is already incorporating some of these recommendations as program administrators and participants learn through experience.

6 Schneider, Lambert & Mohr, Lennart. *A Rating of Designated Operational Entities (DOEs) Accredited under the Clean Development Mechanism (CDM)*. World Wildlife Fund, May 2009.

OQI Criteria #2

Offsets Should Be Based on a Realistic Baseline

High quality offsets should be measured against a realistic baseline in order to achieve a transparent and conservative estimation of a project's GHG emission reduction, avoidance, and/or removal. A baseline is an estimate of the GHG emissions that would occur in the absence of the offset project. Whereas additionality involves demonstrating that a project activity would not have occurred in the absence of the CDM, baselines establish the plausible GHG emissions scenario without the project.

CDM Process for Establishing Baselines

Under the CDM, project participants establish baselines according to guidelines set forth in an approved project methodology. A methodology defines the likely emissions sources and sinks in the absence of a project. The CDM specifies the following three approaches for establishing baselines:

1. Determining that the most likely activity in the absence of the project would be continuance of the existing activity
2. Determining if an economically attractive alternative exists that is neither the existing activity nor the CDM project. In this case, the emissions associated with the most economically attractive alternative to the CDM project would constitute the baseline
3. In the absence of a clear economically attractive alternative, the baseline is based on the average emissions of other commonly implemented and high performing projects in the sector. Projects must have been undertaken in the past five years and have similar geographic, economic, environmental, political, social, and other characteristics.

For example, the baseline scenario for a CDM project that proposes to capture and flare landfill gas might involve a plausible expectation that the landfill owner would normally take no action to reduce or capture methane at the site.[7] In this case, baseline emissions would equal the amount of methane released from the site without any gas capture. However, this is a fairly straightforward example and it is possible that a given project will have multiple plausible baseline scenarios from which the project participant must choose.

Critique: CDM Project-by-Project Baseline Determinations Are Administratively Burdensome

Some market participants believe the CDM's approach to baseline determination is inadequately streamlined and deem the process to be overly burdensome. Project participants have argued that a more efficient alternative approach would be to establish generic benchmarks or default emission factors for particular project types, which would allow for streamlined estimation of baseline emissions.

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7 UNEP. *Baseline Methodologies for Clean Development Mechanism Projects.* UNEP Risø Center, Denmark. 2005.

Recently, the CDM has begun to address this concern by moving away from project-specific baseline scenarios, towards a hybrid approach that combines both project-specific and standardized evaluations. For example, the Executive Board approved a methodology in 2008 for the manufacture of energy-efficient refrigerators, which takes a benchmarked approach to establishing project baselines. As opposed to other methodologies that would require direct measurement of energy consumption, this methodology (number AM0070) sets the baseline as the manufacturing of "refrigerators with the specific electricity consumption corresponding to the calculated benchmark for the respective storage volume class."[8] In other words, the methodology provides a standardized baseline with a default factor for calculating the energy savings of various refrigeration devices. A degree of standardization is also underway for renewable energy and energy efficiency projects, through the compilation of standard baseline emission factors for electricity grids in several developing countries, such as India and South Africa.

OQI Findings & Recommendations

Finding(s): OQI finds that the CDM's approach to baseline establishment is generally sufficient to ensure offset quality, although a transition towards more standardized, benchmarked baselines, where appropriate, could help increase administrative efficiency. At the same time, OQI acknowledges that developing benchmark baselines requires a significant amount of data, research, and work, particularly to ensure that they are current, as well as contextually and regionally appropriate.

Recommendation(s): Standardization of baselines through benchmarking for some types of projects may be appropriate and more efficient in the CDM moving forward. The CDM trend towards benchmarking baselines—as in the case of the AM0070 with efficient refrigerators—can streamline the project development process and reduce transaction costs and investor risk.

As with additionality, standardized baselines are not appropriate for activities and/or regions with heterogeneous characteristics that make accurate generalization difficult. Disadvantages to standardized baselines can include the significant time and cost associated with developing rigorous benchmarks across a broad range of project types, limits to the amount of appropriate project types, and difficulties in accounting for different technological and market conditions across regions and regulatory systems. In other words, while standardized baseline scenarios may be appropriate in certain countries or sectors and for certain project types, they may be inappropriate for those with substantial project-specific considerations.

8 UNFCCC. Approved baseline and monitoring methodology AM0070. Manufacturing of energy efficient domestic refrigerators. Available at: http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_R9YH4PM0RKNA5RGIF0TUMO47IGZIS2.

Offset Criteria #3

Offsets Should Be Accurately Quantified & Monitored

Offsets should be accurately quantified and monitored to ensure that only real, high-quality emission reductions receive credits. To achieve accuracy, projects should have monitoring plans that define how, when, and by whom data will be collected and emissions quantified, using established standards.

CDM Process for Offset Quantification and Monitoring

The CDM requires that an approved monitoring plan for each project be included in its Project Design Document (PDD).[9] CDM methodologies lay out detailed rules and guidance on quantification and monitoring requirements for each project type. Each project's monitoring plan must specify monitoring and quality control procedures, necessary data for collection, measurement accuracy and calibration procedures, the type of measurement instruments, and who is responsible for monitoring. Plans must also address the monitoring of leakage and be available to the public online.[10] Prior to project registration, independent auditors must validate monitoring plans.

Critique

In certain instances, there have been individual technical issues or other problems with methodologies. However, revisions to methodologies have corrected these issues and, broadly speaking, there have been no significant critiques of the CDM's ability to ensure quality offset quantification and monitoring, to date.

OQI Findings & Recommendations

Finding(s): OQI finds that the CDM has strict criteria for emission quantification and monitoring that sufficiently ensures offset quality. Indeed, the CDM has served as a model for emissions quantification and monitoring procedures in subsequent GHG offset programs and standards.

Recommendation(s): The CDM has a strong existing library of methodologies that include accepted monitoring and quantification formulas, and that have preceded most other regional and international standards. In certain instances, requiring the application of internationally recognized technical standards to CDM monitoring plans could support greater standardization of data across projects and project types. Explicit references to these standards also will give project participants and auditors greater clarity on the requirements for project implementation.

9 See Appendix for explanation of CDM Project Cycle and definition of Project Design Document (PDD)

10 CDM Monitoring Reports. Available at: http://cdm.unfccc.int/Issuance/MonitoringReports/index.html.

Offset Criteria #4

Offsets Should Be Independently Validated & Verified

An independent and qualified third party, free from conflicts of interest, should audit (i.e., validate projects or verify project performance) all offset projects to ensure accuracy and impartiality. To avoid conflicts of interest, auditor compensation should not depend on whether the project receives CER credits. Regulatory offset systems should have accredited auditors and procedures in place to review and re-accredit, suspend, or disqualify audit organizations on an ongoing basis.

CDM Process for Offset Validation and Verification

Independent third party auditors in the CDM are called Designated Operational Entities (DOEs) and are accredited by the CDM Executive Board based on criteria relating largely to size, technical competency, and management ability. DOEs are subject to random spot-checks and periodic review by the Executive Board, and substandard work can lead to fines, suspension, or revocation of a DOE's accreditation.

An independent auditor must validate the PDD (i.e., project validation) prior to registration of the project by the CDM. Prior to CER issuance by the CDM, an independent auditor must verify the emission reductions based on *ex post* data on project performance. Project participants contract DOEs to perform these audits, and pay the DOEs for services directly themselves. The use of different DOEs[11] at the validation and verification stages in the project cycle is intended to ensure that the second audit is not biased by findings of the earlier audit.[12]

Critique: Some Independent Third Party Verifiers (DOEs) Have Not Sufficiently Evaluated, Validated, and Verified Projects to Date

Some third party verifiers under the CDM have been criticized for a lack of capacity and competency to undertake the level of quality checks required to ensure offset quality. In addition, because DOEs compete with one other for business, there has been concern that they could be driven to lower the quality of their audits to remain competitive and profitable. Questions surrounding potential conflicts of interest for DOEs also exist, because project participants hire and then pay DOEs themselves.

One example of the issues surrounding third party verification emerged in November 2008, when the largest CDM project auditor, Norway's Det Norske Veritas (DNV), had its accreditation suspended by the Executive Board for five alleged nonconformities related

11 This is true except in the case of small-scale projects, where the same DOE may be used for both validation and verification.

12 DOEs and their subcontractors must be able to demonstrate that they have no existing or potential conflict of interest concerning the project for which they have a contract to provide validation and/or verification services to the project participant (i.e., having consulted for the project participant, having a financial interest in the project, etc.)

to its validation and verification practices.[13] The suspension meant that DNV could not submit projects for registration or request issuance of CERs for clients. At least in part, the suspension reflected a move by the Executive Board to tighten rules and ensure that CDM projects meet more stringent offset quality standards. A second verifier suspension, this time of the firm SGS, signifies continued vigilance by the Executive Board.

OQI Findings & Recommendations

Finding(s): DNV's suspension and later reinstatement, as well as SGS' recent suspension, indicate that procedures for spot-checks and periodic evaluation as well as oversight of DOEs by the Executive Board is improving. However, more training, guidance, experience and the development of standardized protocols for auditing are needed, as well as consensus on what constitutes validation and/or verification best practices. Some progress has been made in this regard, with the adoption of the Validation and Verification Manual (VVM) by the CDM Executive Board in 2008.[14]

Recommendation(s): Significant reforms are needed to better train DOE staff, to align the incentive structures of third party validation and verification, and to ensure greater oversight of DOEs by the Executive Board.

Individuals employed by DOEs should be required to meet a minimum level of training, modeled after the existing training program for Expert Review Team members that review national inventories submitted under the UNFCCC and the Kyoto Protocol. To be on a verification team, individual auditors should have to complete this training and pass an exam, supplementing this training with their own training on internal systems and procedures.

To align incentives and avoid potential conflicts of interest, a neutral party could assign DOEs to projects instead of project participants hiring DOEs themselves. For example, the Executive Board could assign DOEs, operating under a predetermined fee structure, to projects.

In addition, the ability of the CDM Accreditation Panel (which oversees DOEs) to assess whether DOEs have the capacity and competency to justify accreditation could strengthen through mandatory training and testing for Accreditation Panel members and support personnel. To accomplish this, employees must be specifically hired and trained to achieve this goal.

Finally, continual updates and improvements to the Validation and Verification Manual are essential to ensure that DOEs, project participants, and the Executive Board have a clear understanding of the materiality of each requirement to the quality of a project's validation and verification. [15]

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13 An Assessment Team assembled by the CDM Accreditation Panel found five nonconformities relating to DNV's competence in technical areas, deficiencies in internal audits procedures, lack of evidence of actions considered on the nonconformities identified in the internal audits, and a sample of five project activities revealed discrepancies, as did the assessment of the technical review process based on a sample of project activities. A comprehensive list is available at http://cdm.unfccc.int/EB/044/eb44_repan02.pdf.

14 The VVM is a guide designed to assist DOEs with their validation and verification work, by promoting quality and consistency in all DOE reports, and to ensure that each project meets all the relevant requirements of the CDM.

15 Materiality is based on the concept that there are certain omissions or errors in data that are not relevant to the decision of whether or not to issue CERs to a project.

Offset Criteria #5

Offsets Should Be Unambiguously Owned

Offsets should have a single owner with clear rights to the credits, so that the emission reductions they represent are not claimed twice. "Double-counting" can be further prevented by ensuring credits are serialized and accounted for in a registry where transfer of ownership can be clearly documented.

CDM Process for Ensuring Unambiguous Ownership

Before any offset project activity can move forward, the Designated National Authority (DNA)[16] of the host country must approve the project on behalf of that nation's sovereign government. The DNA is thereby responsible for assigning unambiguous ownership rights to emission reduction credits to project participants.

Furthermore, all CDM credits have individual serial numbers and a UN registry that meets international best practice standards for accounting and transactions, like those used in financial banking systems. The registry uses unique account numbers for all participants, and participants may hold each CER in one account at a time. Information in the registry is publicly available on the Internet.[17]

Critique

No significant critiques exist to date on the CDM's ability to ensure unambiguous ownership.

OQI Findings & Recommendations

Finding(s): OQI finds that the CDM is generally sufficient to ensure that offset credits are unambiguously owned. In particular, because the CDM gives developing countries the ultimate power to approve offset issuance, the system is structured to respect domestic sovereignty and ensure clear ownership under domestic law, while simultaneously ensuring that international ownership transactions are clear and credible. Furthermore, the serialization and registry accounting system promotes unambiguous ownership by allowing credit transfers and retirements in a transparent fashion.

Recommendation(s): Requiring host country recognition of CER ownership creates a robust mechanism for establishing unambiguous credit ownership and for prevention of double-counting. Improving national-level governance structures through training and capacity-building would help DNAs do an even better job of avoiding any ambiguous ownership issues that may occur in the future.

16 A DNA, or Designated National Authority, is the national agency that is responsible for approving CDM projects. For any CDM project to move forward, the DNA from each country involved in the project must give their written approval in the form of a Letter of Approval (LoA).

17 http://cdm.unfccc.int/Registry/index.html

Offset Criteria #6

Offsets Should Address Leakage

Leakage is an increase in emissions outside of an offset project's boundaries that occurs as a direct result of the project's implementation. To account for leakage, methodologies should define a "project boundary" which specifies the GHG sources and sinks for which project participants are responsible. Methodologies also should explain how the project will quantify any significant changes in emissions outside the project boundary. Offset programs should require that project participants evaluate potential leakage effects, and that monitoring plans account for actual effects over the life of a project.

CDM Process for Addressing Leakage

In general, project participants must either demonstrate that leakage is unlikely to occur, or monitor and quantify unavoidable leakage and deduct it from the total credited emission reductions by using procedures and formulas prescribed by the project methodology. For example, projects that use wood waste instead of fossil fuel in thermal boilers can cause leakage if wood waste is in short supply, and other local wood-fired boilers switch back to fossil fuels. The CDM methodology (AM-0036) for this kind of project requires project participants to demonstrate that wood waste is abundant. If such a demonstration is not possible, project participants must calculate the increase in fossil fuel emissions likely to occur at other boilers as a result, and must deduct this from the total creditable reductions.

Critique

No significant critiques exist to date on the CDM's ability to address leakage.

OQI Findings & Recommendations

Finding(s): OQI finds that the CDM has methodologies that estimate leakage conservatively for most project types, and its approach to addressing leakage is generally sufficient to ensure offset quality.

Recommendation(s): OQI recommends that the CDM continue to use a conservative approach in identifying and mitigating leakage issues, require all project types to address leakage, and provide methodological guidelines for estimating leakage at a level commensurate with the project type's complexity and risk.

Offset Criteria #7

Offsets Should Address Permanence

For certain project types, there is a risk that emission reductions generated are subject to reversal, and therefore could fail to offset emissions permanently. For example, a forest fire, weather event, or pest attack could release into the atmosphere carbon stored by a forestry project. Therefore, regulatory regimes should address permanence to ensure the minimization of loss in the event of a reversal.

CDM Process for Addressing Permanence

In the case of afforestation/reforestation projects, the CDM addresses permanence concerns by issuing temporary credits that expire at a predetermined time. Once a credit expires, the owner must replace it with another valid credit or emission allowance unit. For example, if a country uses a reforestation credit to comply with its obligations under the Kyoto protocol in 2010 and the credit expires in 2020, the country will have to submit a replacement credit or allowance in 2020 to remain in compliance with its 2010 obligations. A significant disadvantage of temporary crediting is that it treats all forestry carbon as short-lived, even where reversals may not have occurred. The result is increased financial risk and uncertainty for buyers, which creates a disincentive for project participants to invest in forestry projects.

Critique

No significant critiques exist to date on the CDM's ability to ensure permanence. However, critiques do exist about the efficacy of temporary crediting with respect to promoting investment in carbon sequestration projects.

OQI Findings & Recommendations

Finding(s): OQI finds that, while temporary crediting is sufficient to ensure offset quality, the CDM's current approach may be overly conservative, as it creates investor uncertainty and has led to minimal investments in forestry projects under the CDM to date.

Recommendation(s): OQI recommends investigating alternate ways to address permanence. For example, policy mechanisms that address reversal risk could provide more market certainty than temporary crediting mechanisms. Some GHG programs in voluntary and pre-compliance markets are exploring and testing buffer pools and the use of insurance and other financial products as alternatives to temporary crediting. Buffer pools, for instance, address reversal risk by evaluating the risk profile of a project, and then requiring project participants to set aside a portion of the offsets, based on the results of applying a methodology to determine risk and buffer size, into a shared buffer pool. In the event of a reversal, project participants use credits from this pool to account for negated sequestered tons. As another example, insurance products work much like other traditional types of insurance, addressing risk by making the project whole by guaranteeing replacement price for offsets equivalent to the loss. Although applying these mechanisms in many developing countries may be challenging, from a market and investment perspective they could provide a more efficient, certain, and cost-effective approach than temporary crediting.

Offset Criteria #8

Offset Projects Should Do No Net Harm

Offset projects should not cause or contribute to adverse effects on human health or the environment, and should seek to provide health and environmental co-benefits whenever possible.

CDM Process for Ensuring No Net Harm

To ensure that offset projects do no net harm, the CDM requires project participants to sponsor a stakeholder consultation process during the project design phase. During the consultation process, submissions of public comments on the project activity must be solicited, and in-person stakeholder meetings must be held in the local community. Project participants are required to undertake good faith efforts to publicize the event and make materials available in the language of local constituents. The PDD must include a summary of any stakeholder comments received during the public comment period and describe any anticipated environmental, economic, and/or social impacts. The project must then be approved by the host country government and be found consistent with its sustainable development goals, as well as environmental and other regulations.

Critique: CDM Projects Sometimes Cause Local Environmental and/or Social Harm, and/or Fail to Promote Sustainable Development

A small number of CDM projects have come under criticism for causing local environmental or social harm. For example, a number of environmental NGOs including International Rivers, the Center for Biological Diversity (CBD), and the Natural Resources Defense Council (NRDC) submitted comments to oppose the validation of a hydroelectric project in Panama sponsored by AES Corporation. The NGOs claimed the project would have threatened a biologically rich World Heritage Site and the indigenous Ngobe tribe.[18]

Another related critique frequently levied against the CDM is that it has failed to meet one of its primary objectives: to assist developing countries in achieving sustainable development. While failing to promote sustainable development is not necessarily equivalent to doing net harm, it is worth mentioning in this paper because of the prevalence of this criticism in debates over the CDM to date.

According to Schneider, "The actual impact of CDM projects on sustainable development is difficult to assess because it depends on the definition of sustainable development which is defined by most countries in very broad terms. Many countries have established and published criteria to assess whether a project contributes to sustainable development. However, they are often very general. ...[F]ew [projects] comply with criteria that are related to the achievement of the Millennium Development Goals. For example, many CDM projects, directly or indirectly, reduce air pollution or contribute to the diffusion of environmentally sound technologies, whereas only very few projects directly contribute to poverty alleviation."[19]

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18 See the Center for Biological Diversity's press release at http://www.biologicaldiversity.org/news/press_releases/2009/la-amistad-04-23-2009.html for more information.

19 Schneider, Lambert. *Is the CDM Fulfilling Its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options For Improvement.* World Wildlife Fund. November, 2007.

OQI Findings & Recommendations

Finding(s): OQI finds that the CDM's approach to preventing net harm is generally sufficient to ensure offset quality by creating opportunities for public participation and giving host countries recourse to reject projects if they fail to consider and incorporate stakeholder concerns and sustainable development goals. However, OQI acknowledges that ensuring absolute no net harm of all offset projects is difficult, since in all cases some trade-offs are likely to exist. For example, a landfill gas capture system may reduce a number of trace pollutants that can cause unpleasant odor and smog due to ground-level ozone. However, it may also displace impoverished people who rely on scavenging the landfill as the basis of their livelihood.

On the question of whether the CDM sufficiently contributes to sustainable development, OQI generally concurs with Lambert Schneider that such a determination is difficult to make because definitions of sustainable development differ significantly between countries, and are often broad, vague, or multifarious.

Recommendation(s): The CDM Executive Board should continue to work towards ensuring that offset projects do no net harm. Programs to engage and educate local stakeholders so they understand the purpose and impacts of offset projects will improve the CDM's ability to prevent net harm. Improving national-level governance structures, through training and capacity-building, would further help DNAs develop and apply their own sustainable development criteria and evaluation processes.

Conclusion

OQI finds that, with some improvements, CDM can provide an acceptable assurance of project additionality and baselines. Recent trends towards standardization and benchmarking of both additionality and baselines should continue to improve quality. It is important to note that while standardized approaches are often advocated in principle, in reality some project types are less amenable to standardization, and variations across regions and contexts require consideration and flexibility. OQI notes that expert judgment will remain an important complement to standardized approaches.

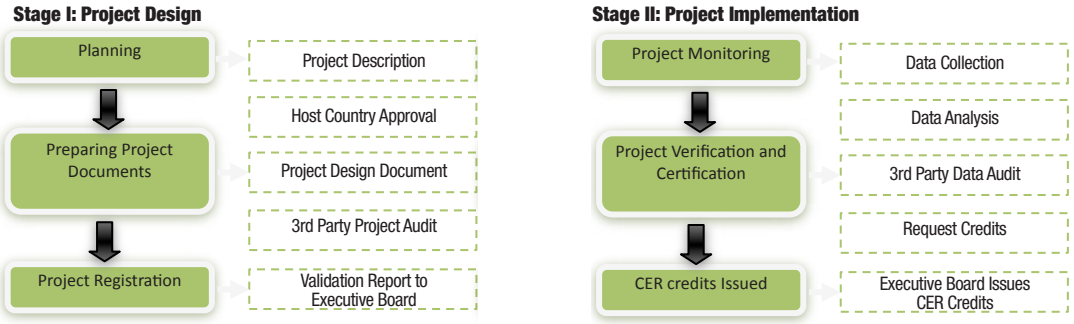
There are still challenges to address and further improvements to make. Project-by-project additionality determinations remain administratively burdensome and susceptible to subjectivity and inconsistency; as such, movement towards a hybrid approach would help streamline the process and increase efficiency while maintaining quality. Significant improvements to the third party verification process are needed, and potential conflicts of interest could be minimized if DOEs are not selected by project participants. New policy mechanisms that address reversal risk can ensure permanence without constraining the market.

On the whole, based on the assessment criteria established in *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy*, OQI finds that the CDM is generally able to ensure sufficient offset quality. As our recommendations continue to be addressed, particularly those regarding additionality determination and third party validation/verification, the CDM could provide quality international offset credits for use in a future U.S. cap-and-trade program.

APPENDIX 1

The CDM Project Cycle

The CDM process involves two stages: project design and project implementation. The CDM requires a number of documents at various points in both stages to demonstrate that a project meets the CDM's requirements.



Stage I begins with the project planning phase, where project participants prepare a document describing the project, and get written approval from each country involved.[20] Among other things, the written approval must show that the CDM project supports the host country's sustainable development goals.

In the project document preparation phase, project participants complete a Project Design Document (PDD). The PDD is a comprehensive document that explains how the project meets the CDM's additionality tests for the activity in question. The PDD also describes the project's geographic boundary, how the GHG reductions will be monitored and estimated, and the period of time the project participant seeks to receive credits.[21] Further, the PDD summarizes any stakeholder comments received during public comment period, describes any anticipated environmental, economic, and/or social impacts, and shows the average annual reductions and total CER volume expected over the project's creditable lifetime. In general, project participants develop projects according to standardized project "methodologies," or blueprints, which the CDM Executive Board approves. These methodologies outline the steps for undertaking a variety of creditable GHG reducing activities.

Before the project can be officially "registered" by the Executive Board, an independent third party auditor, called a Designated Operational Entity (DOE)[22], must review the project activity and documentation against the requirements of the CDM. The DOE checks all information in the PDD to ensure transparency and rigor in data, calculations, and

20 Projects must be in countries that have approved the Kyoto Protocol.

21 Under the CDM, projects are eligible for either a seven-year crediting period with the option to renew up to three times, or one ten-year crediting period with no option for renewal.

22 DOEs are private companies, such as auditing and accounting firms, capable of conducting credible and independent assessments (i.e., without any conflicts of interest) of emission reduction projects.

additionality arguments, and may come back to the project participant with requests for clarifications. The DOE also conducts a site visit to the project to ground-truth the project documentation, and if they find that the project meets all established requirements, they submit a validation report to the Executive Board, which may register or reject the project, or request clarifications if necessary.

Once the Executive Board registers the project, the implementation stage begins with the monitoring phase. Project participants must collect and analyze data from the project, according to standardized procedures established in the project's methodology. The project participant must continually monitor the project over its creditable lifetime and calculate the GHG reductions the project has achieved to successfully receive CER credits.

In the verification and certification phase, project participants again retain a DOE, this time to verify the project's GHG reductions as documented by the data acquired during the project monitoring process. Once the DOE reviews and verifies the data, they submit paperwork certifying the accuracy of the GHG reductions to the EB, and request issuance of CER credits to the project participant.

APPENDIX 2

OQI Member Organization Profiles

The Offset Quality Initiative

The Offset Quality Initiative (OQI) was founded in November 2007 to provide leadership on greenhouse gas offset policy and best practices. OQI is a collaborative, consensus-based effort that brings together the collective expertise of its six nonprofit member organizations: The Climate Trust, Pew Center on Global Climate Change, Climate Action Reserve, Environmental Resources Trust–Winrock International, Greenhouse Gas Management Institute, and The Climate Group.

The four primary objectives of the Offset Quality Initiative are:

- To provide leadership, education, and expert analysis on the issues and challenges related to the design and use of offsets in climate change policy
- To identify, articulate, and promote key principles that ensure the quality of greenhouse gas emission offsets
- To advance the integration of those principles in emerging climate change policies at the state, regional, and federal levels
- To serve as a source of credible information on greenhouse gas offsets, leveraging the diverse collective knowledge and experience of OQI members

The Climate Trust

The Climate Trust is a nonprofit organization founded in 1997 whose mission is to promote climate change solutions by providing high-quality greenhouse gas (GHG) offset projects and advancing sound offset policy. The Climate Trust fulfills its mission by providing carbon finance for innovative, high quality offset projects; by providing consulting services and customized large-scale offset programs for businesses, governments, and utilities; and by using its practical experience to advance sound climate policy and market development. As a pioneering offset provider in both the compliance and voluntary offset markets in the United States, The Climate Trust offers a unique perspective to policymakers at the state, regional, and national levels. The Climate Trust spearheaded and leads the Offset Quality Initiative. For more information, go to www.climatetrust.org.

Pew Center on Global Climate Change

The Pew Center on Global Climate Change was established in 1998 as a nonprofit, nonpartisan, and independent organization dedicated to providing credible information, straight answers, and innovative solutions in the effort to address global climate change. The Center engages decision-makers at the federal, state, regional, and international levels to achieve its goals for mandatory federal climate change policy and a post-2012 international climate agreement. The Center's Business Environmental Leadership Council (BELC), a group of 45 mainly Fortune 500 companies with over $2 trillion in combined revenue, is the largest U.S.-based association of corporations committed to advancing mandatory policy and business solutions to address climate change. The Pew Center is also a founding member of the influential U.S. Climate Action Partnership.

Climate Action Reserve

The Climate Action Reserve is a U.S. private nonprofit organization addressing climate change and bringing together participants from the government, environment, and business sectors. It works to ensure environmental benefit, integrity, and transparency in greenhouse gas (GHG) emissions accounting and reduction and progressive movement in GHG emissions policy nationally and in the western United States. The Climate Action Reserve is parent to three programs: the California Climate Action Registry, Climate Action Reserve, and Center for Climate Action. As the subsequent organization of the California Climate Action Registry, the Climate Action Reserve continues building on the California Registry's reputation as a respected and internationally recognized leader in climate change issues.

Environmental Resources Trust – Winrock International

The Environmental Resources Trust (ERT) and the American Carbon Registry, business units of the nonprofit Winrock International, are leaders in the U.S. voluntary and pre-compliance greenhouse gas (GHG) emissions trading markets. ERT, and its American Carbon Registry, joined Winrock in 2007, expanding its blended engineering, carbon finance, modeling and measurement, and science-based policy skills and expertise across the agriculture, forest, electric power, and clean energy sectors. The American Carbon Registry is the first private voluntary GHG registry in the U.S. and continues to be the largest and one of the most respected registries in the voluntary and pre-compliance markets. A host of Fortune 500 companies, project developers, financial institutions, and nonprofit organizations trust ERT and the American Carbon Registry to provide the GHG measurement and accounting, methodology development and validation, project registration, and offset issuance, trading, and retirement expertise they need to be successful in the U.S. carbon market.

Greenhouse Gas Management Institute

The Greenhouse Gas Management Institute, a registered nonprofit organization, trains, certifies, and networks a global community of experts that account, audit, and manage GHG emissions based on world-class training and professional standards. The Institute's membership includes individuals and organizations, from beginners to certified professionals, working on all aspects of climate change. Founded in 2007 through a partnership between ClimateCHECK and the GHG Expert Network, the Institute works with the World Resources Institute, the World Bank, the United Nations, the Carbon Disclosure Project, Point Carbon, Harvard University Extension School, and our exceptional faculty on training and professional development programs utilizing innovative Internet tools to ensure that professionals will be available to support future market mechanisms and other policy responses to climate change. For more information, go to www.ghginstitute.org.

The Climate Group

The Climate Group is an independent, nonprofit organization that works with government and business leaders to accelerate the transition to a low-carbon economy. Its coalition of proactive leaders —from government, business, and NGOs—has demonstrated that the emissions reductions needed to stop climate change can be achieved while boosting profitability and competitiveness. Companies, states, regions, and cities around the world are realizing there are significant economic as well as environmental advantages of taking decisive action now. The Climate Group was founded in 2004 and has offices in the United Kingdom, the United States, China, India, and Australia.

The work of the Offset Quality Initiative is generously supported by the Energy Foundation.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