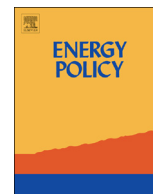




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Net climate change mitigation of the Clean Development Mechanism

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H I G H L I G H T S

- The CDM's method for assessing additionality remains controversial and contested.
- We develop two scenarios of the net emissions impact of the CDM.
- The integrity of the CDM hinges on the emissions impact of power supply projects.
- Additionality is hard to demonstrate with confidence for most power-supply projects.
- A number of options are available to increase the mitigation benefit of the CDM.

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A B S T R A C T

The Clean Development Mechanism (CDM) has allowed industrialized countries to buy credits from developing countries for the purpose of meeting targets under the Kyoto Protocol. In principle, the CDM simply shifts the location of emission reductions, with no net mitigation impact. Departing from this zero-sum calculus, the Cancun Agreements reached at the sixteenth session of the Conference of the Parties (COP) in 2010 called for “one or more market-based mechanisms” capable of “ensuring a net decrease and/or avoidance of global greenhouse gas emissions”, an intention reiterated at COP 17 and COP 18. This article explores the extent to which the CDM may or may not already lead to such a “net decrease.” It finds that the CDM's net mitigation impact likely hinges on the additionality of large-scale power projects, which are expected to generate the majority of CDM credits going forward. If these projects are truly additional and continue to operate well beyond the credit issuance period, they will decrease global greenhouse gas emissions. However, if they are mostly non-additional, as research suggests, they could increase global greenhouse gas emissions. The article closes with a discussion of possible means to increase mitigation benefit.

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1. Introduction

The Clean Development Mechanism (CDM) has allowed industrialized countries to buy credits from developing countries for the purpose of meeting targets under the Kyoto Protocol. In principle, the CDM is designed to allow for flexibility in the location of emission reductions and thus decrease the overall cost of meeting emission targets, while providing sustainable development benefits in host countries. To first order, the overall level of global emissions (and emission reductions) should be unaffected by the use of the CDM. While CDM projects lead to emission reductions

in host countries, the use of issued Certified Emission Reduction credits (CERs) from these projects allows buying countries to increase their own emissions (above target levels) by a corresponding amount. The CDM, therefore, should function as a zero-sum instrument, with no net mitigation impact.

In an explicit departure from the simple zero-sum calculus of the CDM, the Cancun Agreements reached at the sixteenth session of the Conference of the Parties (COP) in 2010 called for “one or more market-based mechanisms” capable of “ensuring a net decrease and/or avoidance of global greenhouse gas emissions” (UNFCCC, 2011a, para. 80), an intention that was reiterated at COP 17 in Durban in 2011 (UNFCCC, 2012a, para. 79) and COP 18 in Doha in 2012 (UNFCCC, 2012b, para. 42). This, in turn, has raised questions regarding the impact of the CDM and its future direction. Firstly, what is the expected net emissions impact of the current CDM (i.e. with its current methodologies, procedures and project pipeline)? In other words, are the actual emission

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reductions that occur as a result of the CDM in total more or less than the number of CERs issued and used to meet emission reduction obligations? And, secondly, what are the options for improving the net emissions impact of the CDM or similar mechanisms, were this to be an explicit aim in the future?

To help address these questions, this article, adapted from research commissioned by the UNFCCC's CDM Policy Dialogue (Spalding-Fecher et al., 2012), explores the extent to which CERs represent additional GHG emission reductions and whether research suggests that, in aggregate, issued CERs are matched by a corresponding level of actual GHG emission reductions. It then briefly discusses options for improving the net emissions impact of the CDM.

2. Material and methods

2.1. Theory of additionality and project crediting

The CDM relies on two closely related concepts to determine project eligibility and award credits: additionality and baselines. In simple terms, additionality means that a policy intervention (in this case, the CDM) causes an activity that would not have occurred in the absence of the intervention (Gillenwater and Seres, 2011). Additionality is the cornerstone of project-based offset mechanisms. If a project is judged to be additional, it can be issued credits for the emission reductions achieved. Emission reductions are estimated relative to an emission baseline, which seeks to represent as accurately as possible the level of emissions that would have occurred had the CDM project activity not been implemented.

2.1.1. Additionality

Assessing additionality is inherently difficult and controversial. Demonstrating additionality requires establishing a causal connection between the policy intervention and the project activity, by assessing whether the project activity would not have occurred in the absence of the policy intervention. Since a hypothetical 'without CDM world' cannot be directly observed, additionality can never be demonstrated with absolute certainty (Schneider, 2009b; Gillenwater and Seres, 2011). On one hand, the CDM may be seen to "cause" projects to occur due to the expected financial value of the CDM's CERs or the reputational or learning value of registering and operating projects; on the other hand, so too may other factors unrelated to the CDM, such as strategic, market or financial benefits of the project itself, as well as any policies and regulations that might encourage project implementation. Recognizing and balancing these inherent uncertainties and challenges, the CDM, like other offset programmes, has established procedures that enable an assessment of additionality. The CDM "additionality tool", a suite of methods including regulatory screens, barrier analysis, investment analysis, and a common practice test, applied to a project-by-project basis, is the most widely used of these procedures.

For over a decade, researchers have raised concerns about the ability of project-by-project assessment methods, such as those embodied in the CDM's additionality tool, to adequately assess additionality (Grubb et al., 1999). Many have argued that the fundamental flaws in these tests – or inadequate verification and review of them – have limited the ability of the CDM to adequately exclude non-additional projects (Bogner and Schneider, 2011; Gillenwater and Seres, 2011; Gillenwater, 2011; Haya and Parekh, 2011a; Schneider, 2009a; Wara, 2006), while other critics have suggested that additionality tests can be made more credible (Greiner and Michaelowa, 2003). By contrast, project developers

assert simply that if a "project fulfils the rules [of the additionality tool and its tests], then... it is additional" (PDF, 2012).

Finally, some have noted that the CDM might create a perverse incentive for governments to weaken or delay policies, or enforcement of regulations, that would otherwise reduce emissions – e.g., China's electricity tariffs for wind power or regulations related to coal mine methane releases (He and Morse, 2010). To address this concern, the CDM regulatory body, known as the Executive Board (EB) adopted a rule in 2007 allowing such policies and measures to be disregarded if they were adopted after the modalities and procedures of CDM were established (i.e. late 2001). While this rule (commonly referred to as "E-") may enable CDM to support countries in adopting or strengthening such policies and measures, it can also make the determination of additionality for individual projects even more difficult. The impacts of these policies can be difficult to isolate and remove from additionality and baseline assessment. Nor is it always clear whether CDM played an important role in adopting the policies in question. Furthermore, if only by ignoring policies enacted since 2001, such as subsidy for wind power, is a project determined to be additional, then this assessment does not necessarily mean that the project would not have occurred without the CDM (Spalding-Fecher, 2013). The E- rule represents a compromise between ensuring environmental integrity and avoiding perverse incentives.

Many sources have explored the concept of additionality in general, and the intent here is not to summarize or review those discussions (Bogner and Schneider, 2011; Classen et al., 2012; Gillenwater and Seres, 2011; Gillenwater, 2011; Haya and Parekh, 2011a; Schneider, 2009a; Wara, 2006). Instead, in this paper, we build on these prior discussions and assessments to explore how the practices applied to additionality testing and quantification of emission reductions for several major CDM project types might affect the net mitigation impact of the CDM.

2.1.2. Baselines and project crediting

Under the CDM, emission reductions are estimated relative to an emission baseline, which seeks to represent as accurately as possible the level of emissions that would have occurred had the CDM project activity not been implemented. Just as with the closely related concept of additionality, a true baseline can never be determined with absolute certainty. As a result, the number of CERs issued for any given project could be some fraction more or less than the 'actual' emissions reduced or avoided. Since credits are awarded to the extent that the project reduces emissions below its baseline, if the baseline is set too high, the project is awarded too many credits (overcredited). If the baseline is set too low, the project is undercredited. Over- and under-crediting (as defined here) can only apply to projects that are truly additional, i.e. where some 'actual' emission reductions exist. Otherwise, the project would have occurred anyway and no credits at all should, in principle, be attributed to the CDM.

A number of practices or outcomes could lead to biases in the baseline and hence to over- or undercrediting under the CDM and, by extension, net increases or decreases in global GHG emissions.

The following practices or outcomes could lead to overcrediting of CERs:

- **Setting baseline emissions at a higher level than the most likely future scenario.** If the baseline emission level is set higher than what would have been expected had the CDM project activity not been implemented, overcrediting will result. Researchers have asserted that CDM project hosts have an incentive to select baseline scenarios or key data or assumptions that result in the calculation of an inflated baseline emission level in order to receive greater numbers of CERs

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