

# The Clean Development Mechanism

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## List of Abbreviations

CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CMP	Conference of the Parties serving as the Meeting of the Parties
CO <sub>2</sub> eq	Carbon Dioxide Equivalent
DNA	Designated National Authorities
DOE	Designated Operational Entity
EB	Executive Board
GHG	Greenhouse Gas
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

## Introduction

Anthropogenic climate change is amongst the key issues facing the planet and greenhouse gas (GHG) emissions are driving it (Subbarao and Lloyd 2011). In the 1990s the United Nations Framework Convention on Climate Change (UNFCCC) was developed to tackle the problem of reducing emissions globally (Kim et al. 2013). Subbarao and Lloyd (2011) recognise that one of the biggest challenges in doing this, is the contrast between the emissions produced by developed and developing countries who, the latter of which only contributes to 30% of global emissions despite making up 80% of the world's population (IEA 2006). This highlights another significant global problem, which is the lack reliable, clean energy throughout a lot of developing countries, an issue recognised by Teske et al. (2007). The UNFCCC marked the beginning of a global effort to address these problems, however, it wasn't until the Kyoto Protocol came into place in 1998, that there was a binding agreement committing developed countries to reducing their GHG emissions (Kim et al. 2013). The Kyoto Protocol includes a central mechanism known as the clean development mechanism (CDM), which allows developed countries that are bound by emission reduction commitments to offset their emissions by investing in carbon reduction projects in developing countries (Toumbourou 2011). The CDM, in theory, is a great policy for addressing a number of issues, including those outlined above, however, there are many concerns with some characteristics of it (Wara 2008). This essay will explain the CDM in the bigger scheme of things, the money instruments involved, the countries and organisations of the CDM, the information instruments in use and, finally, will assess the good and the bad of the CDM, particularly in relation to its appropriateness, efficiency and effectiveness.

## The CDM in the Bigger Scheme of Things

### *How does the CDM relate to the United Nations Framework Convention on Climate Change and Kyoto Protocol?*

The UNFCCC is an international treaty that was created at the United Nations Conference on Environment and Development (UNCED) in 1992 and that came into force in 1994 (UNFCCC 2013). It's key objective was the 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system' (United Nations 1992, p. 9). However, the treaty did not include any binding emission reduction agreements. Five years later, the Kyoto Protocol, a binding document setting limits on developed countries' GHG emissions, was finalised. Within the Kyoto Protocol, there is a measure of flexibility built in to the agreement in the form of three flexibility mechanisms; emissions trading, CDM and joint implementation (UNFCCC 1998). They are in place as a means of reducing the total economic costs of reducing emissions (Rahman et al. 2010). The CDM is specifically designed to promote clean development in developing countries (referred to as non-Annex 1 countries) and assist developed countries (Annex 1 countries) 'in achieving compliance with their quantified emission limitation and reduction commitments' (UNFCCC 1998, p. 11).

## Money Instruments

### *What are the main money instruments used by the CDM?*

Althaus et al. state that money instruments can be used to 'influence individual behaviour through financial disincentives' (2007, p. 92). The CDM utilises certified emission reduction (CER) credits as a money instrument to this, and to achieve the goal of assisting developing countries with sustainable development and developed countries meeting their emission commitments (UNFCCC 1998). This works through emission reduction projects, which are undertaken in developing

countries and which can include clean energy developments (solar or wind farm), afforestation or reforestation projects, or carbon capture and storage initiatives (Grubb 2003; UNFCCC 2012). Using a baseline (an estimation of the emissions that would have occurred without the project in place) CER credits are allocated based on the amount of emissions avoided as a result of the project, with each credit equal to one tonne of CO<sub>2</sub>eq (UNFCCC 2013). CERs can then be traded or used to meet emission commitments (Lecocq and Ambrosi 2007).

A common criticism of the CDM is the lack of money instruments (Chadwick 2006). For example, Burniaux et al. note that ‘the CDM is asymmetric by nature, as it rewards emission reductions but does not penalise increases’ (2009, p. 62). This can lead to the emergence of the dynamic inefficiency issue, which sees emitters ‘cheating’ the system by increasing their emissions to begin with so they are easily able to decrease their emissions drastically and reap the rewards (Burniaux et al. 2009; Chadwick 2006; Wara and Victor 2008). This will be examined in more detail in the section, *The Good and the Bad of the CDM*.

## Countries and Organisations

*What organisation or organisations oversee the CDM, what two types of countries are involved, and what roles do they play?*

There are two broad categories of countries that are involved in the CDM, Annex 1 countries, and non-Annex 1 countries (UNFCCC 2013). Annex 1 countries are mostly developed countries and are subject to emission constraints, under the Kyoto protocol (UNFCCC 2013). Non-Annex 1 countries are mostly developing countries and are not bound by emission constraints (UNFCCC 2013). The role of developing countries is to play host to carbon reduction projects that decrease net emissions, primarily through activities such as afforestation, reforestation, renewable energy projects and carbon capture and storage (CCS) initiatives (UNFCCC 2013). Developed countries, through these projects, can earn CERs, which are outlined in the previous section.

There are a number of organisations involved in the CDM, including the CDM Executive Board (CDM EB) who is in charge of overseeing processes. The EB is responsible for determining whether a project is or isn't contributing to a net reduction in emissions. Applicants (the developed countries) must prove, through methodologies detailed by the EB, that any proposed carbon reduction project would not have happened anyway, and they must determine a baseline (an estimation of the emissions if no project occurred). At this stage, a Designated Operational Entity (DOE) determines the validity of the project and the baseline, acting as a third party. The EB has the final say as to whether a project will or will not be approved. The Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (the CMP) is the main authoritative body and makes the rules of the CDM. It also determines the decisions made by the EB and designates operational entities (UNFCCC 2013). Designated National Authorities (DNA) are responsible for approving projects and facilitating participation, and are designated by parties participating in the CDM (UNFCCC 2013).

The EB is supported by a number of smaller groups with specific roles:

- Methodologies Panel – develops guidelines for methodologies and makes recommendations to the EB;
- Accreditation Panel – prepares the decisions of the EB, based on the procedure for accrediting operational entities;
- Registration and Issuance Team – assists EB with appraisals;
- Small-scale Working Group – prepares recommendations on proposals for new baseline and monitoring methodologies for small-scale CDM projects;

- Afforestation and Reforestation Working Group – prepares recommendations on proposals for new baseline and monitoring methodologies for afforestation/reforestation CDM projects;
- Carbon Dioxide Capture and Storage (CCS) Working Group – prepares recommendations on proposals for new baseline and monitoring methodologies.

## Information Instruments

### *What information instruments are used to monitor and report on the CDM?*

Methodologies are important information instruments that provide direction for the CDM processes (UNFCCC 2012). They play a crucial role in determining the baseline for a project, in monitoring the project's ongoing success and in assessing the final result (UNEP 2013). A baseline and monitoring methodology is required to calculate the amount of CERs generated through a CDM project (UNFCCC 2012). Methodologies fall under four categories:

- (1) Methodologies for large-scale CDM project activities;
- (2) Methodologies for small-scale CDM project activities;
- (3) Methodologies for large-scale afforestation and reforestation (A/R) CDM project activities; and
- (4) Methodologies for small-scale A/R CDM project activities (UNFCCC 2012).

To ensure the CDM operates effectively, in-depth information about the processes involved is made available through the UNFCCC website. Additionally, projects include public engagement and information sharing by conducting informational meetings and making project documents, reports and environmental impact assessments available to the public (UNFCCC 2013). CDM projects also have a requirement to include a monitoring plan to record emissions data. This is produced as per the methodologies (UNFCCC 2012) and is verified and 'should provide confidence that the emissions reductions and other project objectives are being achieved' (UNEP 2013, p. 13). Once the project is in operation, a monitoring report is produced (UNEP 2013). It is also important to note that project participants are able to propose new methodologies to the EB for approval (UNEP 2013).

## The Good and the Bad of the CDM 600

### *Do you think that the CDM is a well-designed policy in terms of appropriateness, efficiency and effectiveness? Why or why not? Provide evidence to support your answer.*

In theory, the CDM is great tool to promote clean development in developing countries and to lessen the costs of reducing GHGs in developed countries. However, there are elements of it that are not well-designed in terms of appropriateness, efficiency and effectiveness, and that have ultimately led to its failure in many ways (Althaus et al. 2007; Burniaux et al. 2009). Some concerns with the CDM are questions of actual 'additionality', that is the ability of a project to actually reduce emissions from what they would have been had the project not occurred (UNFCCC 2012), the fact that there are no incentives for developing countries to decrease their emissions, there is added transactional costs (which raises questions regarding efficiency) and sometimes local resilience to major CDM projects (Burniaux et al. 2009; Zhou et al. 2013; Chadwick 2006). Additionally, participation is voluntary, baselines are difficult to define, and the CDM may act as a barrier against other environmental policies in developing countries (Fischer 2004; Strand 2010, Rosendahl and Strand 2009). However, there are successful elements of the CDM, which, despite its cracks and loopholes, is theoretically a good policy (Zhou et al. 2013; Cheng et al. 2008), Many elements of the CDM

could be adopted in a revised carbon market-based policy, such as the introduction of the Programs of Activities (PoA) and the standardised methodologies approach to all CDM projects, (Zhou et al. 2013; Cheng et al. 2008; Ellis and Kamel 2007; Schneider 2007).

The UNFCCC state that the reduction of emissions from CDM projects in developing countries should be ‘additional to any that would occur in the absence of the certified project activity’ (1998, p. 12). However, Burniaux et al. (2009) argue that it is incredibly difficult to determine if a CDM project is actually effective in achieving additionality. In fact, research by Rosendahl and Strand (2011) shows that the CDM is likely to be increasing GHG emissions globally, through increased carbon leakage. They state, ‘leakage occurs because emissions reductions under a CDM project may affect market equilibrium in regional and/or global energy and product markets, and thereby increase emissions elsewhere’ (Rosendahl and Strand 2011, p. 27). Shneider (2007) found that the CDM has not been effective in reducing GHG emissions and Wara and Victor concur, stating that, ‘much of the current CDM market does not reflect actual reductions in emissions’ (2008, p. 5). However, these opinions are not echoed unanimously within the research (Huang and Barker 2012). Other research shows that CDM projects could potentially result in widespread adoption of low-emission technologies such as renewable energy sources (Banuri and Gupta 2000). It can be seen, from the mixed views in the literature, that there needs to be a comprehensive, in-depth review of the overall effects of the CDM on global GHG emissions.

Another concerning characteristic of the CDM, which is echoed in the literature, is the fact that it ‘may create perverse incentives to increase emissions in developing countries’ which is certainly not appropriate (Burniaux et al. 2009, p. 12). Developing countries lack incentive to reduce their GHG emissions, as they are not bound by emission reduction requirements (Chadwick 2006). In fact, due to the fact that the CDM rewards decreases in emissions but doesn’t penalise increases, it is subject to the dynamic inefficiency problem, described by Baumol and Oates (1988). This is where parties increase their emission habits during the initial phase where assessment occurs, then they are awarded when they are able to rapidly (and with relative ease) decrease their emissions in a following phase of operation (Burniaux et al. 2009; Chadwick 2006; Wara and Victor 2008). The current setup also provides no incentives for developing countries to adopt emission reduction commitments in the future (Burniaux et al. 2009).

## Conclusion

This essay has provided an analysis of the CDM, an instrument within the Kyoto Protocol that seeks to stimulate clean development in developing countries and assist developed countries meet their emission reduction requirements. The CDM, a result of a global initiative to tackle climate change that begun with the formation of the UNFCCC and eventually the Kyoto Protocol, involves money instruments in the form of tradable CERs. CERs are equal to one tonne of CO<sub>2</sub>eq and are ‘earned’ by reducing GHG emissions by undertaking carbon reduction projects in developing countries. CERs can be sold or used by developed countries to meet their emission reduction targets. There are many organisations involved in overseeing, monitoring, reporting and validating aspects of this CDM process, which involves the complex task of determining a baseline of what emissions would have been produced in the absence of a project. The CMP and the EB are the main bodies involved and are supported by a network of other groups. This essay has looked into the information instruments and methodologies which involve open access to information about projects, as well as a means of monitoring and reporting. Furthermore, the appropriateness, efficiency and effectiveness of the CDM were looked at and an examination of the literature found that, despite the policy being a good solution in theory, there are many flaws that have lead to it failing, or being perceived to fail, across a number of areas.

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