

# CDM

**Clean Development Mechanism**

**What is it?**

**How does it work?**



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for Economic Cooperation  
and Development



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# Clean Development Mechanism:

Project-based cooperation between industrialised and developing countries to protect the climate

Since the 1980s human influence on global climate through emissions of greenhouse gases such as carbon dioxide and methane has become more and more apparent. Due to their geographical and economic situation, many developing countries are particularly vulnerable to the impacts of climate change. Against this background, in 1992 the UN Conference on Environment and Development in Rio de Janeiro took the first step towards a global climate policy. Almost all countries signed the United Nations Framework Convention on Climate Change (UNFCCC).

Climate protection is a global challenge whose main burden has to be borne by wealthy countries. These have contributed most to global warming, measured by per capita emissions. In the UNFCCC, industrialised countries agreed on voluntary measures to limit greenhouse gas emissions. However, it became clear very soon that voluntary targets would be insufficient to stop the increase of greenhouse gas emissions. Binding commitments became necessary.

According to the Kyoto Protocol of 1997, industrialised countries and Eastern European countries in transition have to reduce their emissions in the period from 2008 to 2012 by five percent (compared to the base year 1990). Each country has a different target; Germany, for example, has to reduce its emissions by 21 percent. The emissions covered by the Protocol are those of carbon dioxide, methane and nitrous oxide, along with the release of long-lived hydrofluorocarbons and sulphur hexafluoride.

Developing countries have to report on the development of their emissions, but (so far) have no emissions commitments. Nevertheless, they are to be integrated into global climate policy at an early stage and be supported by industrialised countries. The Clean Development Mechanism (CDM) is one of the most important instruments to achieve this aim.

Joint Implementation (JI), another mechanism to meet the commitments at minimum cost, covers project-based climate cooperation between industrialised countries.

## A promising quid pro quo - the Clean Development Mechanism

The Kyoto Protocol attempts to achieve global climate protection and cost minimisation by introducing an innovative mechanism for cooperation in climate protection between industrialised and developing countries: the Clean Development Mechanism (CDM). This project-based mechanism aims to combine two targets of the Convention and the Protocol:

1. Industrialised countries are supported in reaching their emissions targets
2. At the same time, developing countries are supported in sustainable development

The second target can be achieved through the provision of urgently needed additional capital, know-how and technologies, particularly in the fields of renewable energy and energy-efficiency improvement in developing countries.

### The basic idea of the Clean Development Mechanism

- 1a) Industrialised countries - either the state or private companies - invest in projects in developing countries that contribute to the reduction of greenhouse gas emissions.
- 1b) Developing countries - either the state or private companies - are allowed to implement such projects on their own.
- 2) Through these projects, not only will the respective sector in this developing country be modernised, but also a contribution will be made to global climate protection.
- 3a) The investing industrialised country can credit the emissions reductions achieved through its investment in the developing country towards its own emissions commitment.
- 3b) The developing country can sell the emissions credit generated to industrialised countries.

Box 1



# What is this? How does it work?

## What contribution can CDM make to sustainable development in the partner countries of German development cooperation?

The CDM opens up the opportunity of mobilising additional funding for investment in developing countries, emphasizing renewable energies and energy efficiency. For this to take place, there must be an effective national institutional structure for the approval of CDM projects, framework contracts must be negotiated and agreement must be reached on which project types are to be given priority. Public participation is also essential, as is the integration of different interest groups.

When criteria are defined for sustainable development, care should be taken that they are not too narrow. Otherwise potential investors do not have enough choices. Possible criteria may be in the following categories:

- Environmental (local environmental protection)
- Social (employment, impacts on low-income groups, regional and sectoral integration, no resettlement and no destruction of the habitat of the local population)
- Economic (balance of payments, cost efficiency, maximisation of positive effects on the host country)
- Technological (contribution to self-sufficiency, innovation and replicability)

As there will be strong competition for CDM investors, countries have to act now if they want to participate in the CDM from the outset. For example, the success of Latin American suppliers of projects for the World Bank's Prototype Carbon Fund can be explained with the years of experience gained during the pilot phase for joint climate protec-

## How does the CDM work?

Generally, industrialised countries use advanced and efficient technologies for electricity generation and industrial production. However, in many developing countries obsolete processes prevail that waste resources. For example, many developing countries operate coal-fired power stations with efficiencies of below 30 percent, whereas new coal power plants in industrialised countries operate more than a third more efficiently. Improving advanced technology, though, costs much more than replacing obsolete plants, and therefore the cost of reducing one tonne of greenhouse gases in developing countries is much less than that in industrialised countries.

As it is irrelevant to the world climate where the greenhouse gas abatement takes place, the CDM generates advantages for all participants as the achieved emissions reduction is measured and credited towards the emissions commitments of investing countries through emissions credits (CERs). Thus both the investor and the host country profit from the CDM through cost reduction and support for economically, socially and ecologically sustainable development. A few examples can illustrate this:

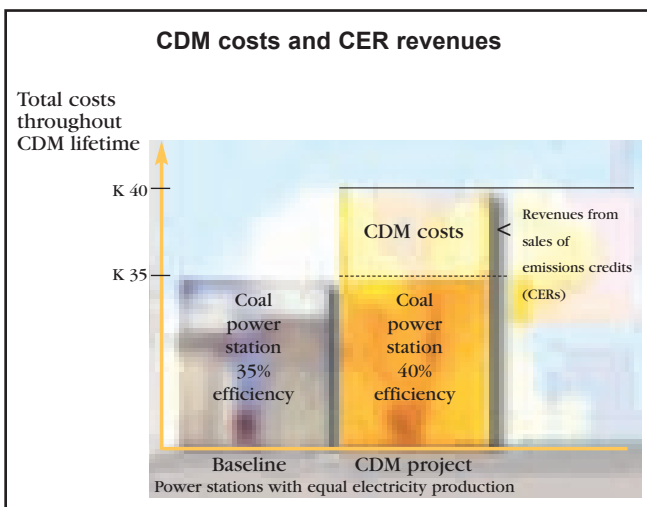
In **Zimbabwe** we analysed how much electricity could be produced by power plants using waste wood from timber plantations and sawmills. While currently more than 90 percent of wood waste is simply burned, power stations fired with this resource would not only cover the electricity needs of the sawmills, but could also feed electricity into the public grid. Depending on the baseline calculation, each power plant would reduce CO<sub>2</sub> by between 7,000 and 24,000 tonnes per year. Further benefits would be job creation and the introduction of a new method of electricity generation.

The national strategy study on the CDM in **Indonesia** estimated the technical potential and costs of greenhouse gas reduction projects. The selection criteria were compatibility with national energy policy, financial outlays, and acceptability among decision-makers. The study assessed Indonesia's CDM potential up to 2012 at 125 million tonnes of CO<sub>2</sub>, made recommendations on concrete CDM implementation, and suggested ten specific projects.



## The CDM: a challenging instrument

The principle of CDM is fascinating. CDM projects have to fulfil several important criteria, though. The environmental integrity of the Kyoto Protocol must not be damaged by the creation of emissions credits that do not reflect real emissions reductions. Moreover, public participation is essential. On the other hand, this must not have an overly strong impact on cost efficiency. Some critical details such as baseline determination or the integration of forestry projects remain to be negotiated internationally.



### Curriculum vitae of a CDM project: from the idea to the emissions credit

A CDM project usually starts with the idea of manufacturing a **product** in a developing country - for example electricity - using a minimum-cost technology. **The project idea** can be developed by a potential investor, an economic actor, the host country government, or by third parties (service providers, consultants). Existing technology in many cases will be comparatively **inefficient** and lead to unnecessarily high greenhouse gas emissions. The CDM now allows the creation of **another product** - the emissions credits - by introducing a **more efficient**, often more expensive technology. Generally, in the initial phase of CDM, investors will use existing ideas and modify them slightly. Projects developed specifically for the CDM will remain an exception. Since 1996 a pilot phase (Activities Implemented Jointly, AIJ) has been running that is intended to lead to concrete projects and improvement of their design.

A CDM project has to pass through the following stages until emissions credits are created (see hypothetical case study at [www.gtz.de/climate/english/cdm.htm](http://www.gtz.de/climate/english/cdm.htm)):



If the host country fulfils the criteria for participation (see Box 2), the investor has to apply for **approval** of the project by the host country. Prior to this step, the investor, the "local" partner in the host country and participating governments will have informal discussions.

### Criteria for CDM host country participation

The host country

- has to have ratified the Kyoto Protocol,
- has to have identified a national CDM authority,
- is not to be listed in Annex B of the Kyoto Protocol (Annex B lists all industrialised countries that have taken emissions commitments).

Box 2

The national CDM authority of the **host** country checks whether the project fulfils **national sustainability criteria**. These can cover economic, social and environmental aspects. The process usually includes an environmental impact assessment of the planned project.

Like all other aspects of a CDM project, sustainability is assessed on the basis of detailed project documentation with the following crucial elements:

1. a technical project description
2. a **baseline** (see Box 3) and
3. a **monitoring plan** to assess project emissions.

A project **lifetime** also has to be chosen (see Box 4).

### Project lifetime

There are two options for project lifetime:

- three times seven years with update of the baseline
- one lifetime of ten years

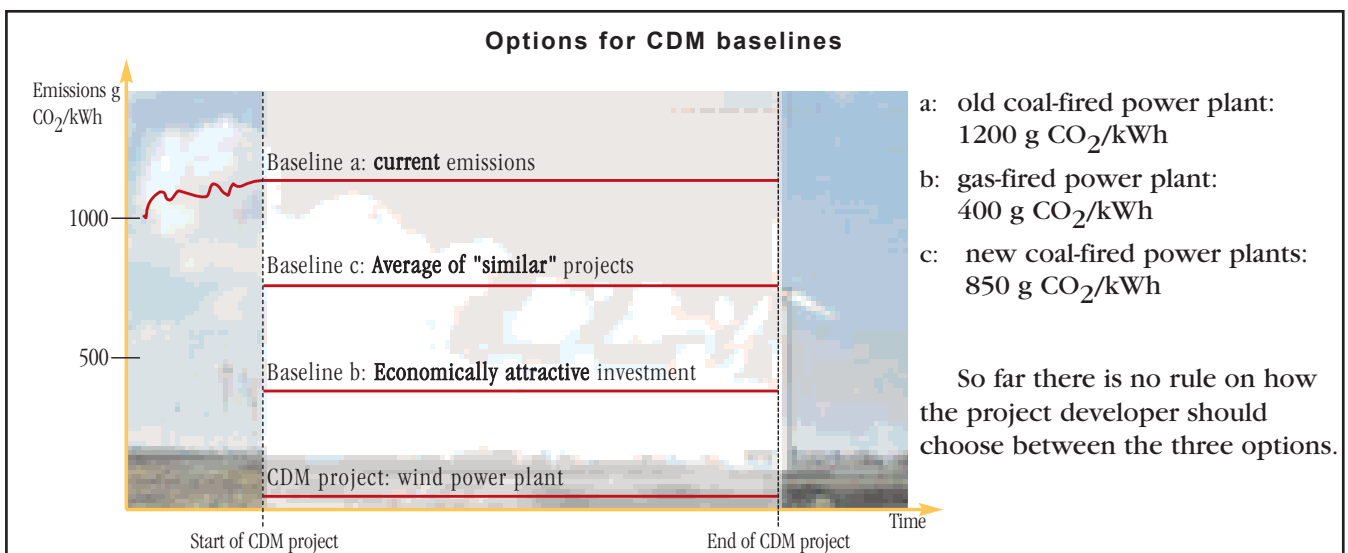
B o x 4

### The baseline - foundation for calculating emissions credits

The question about the level of greenhouse gas emissions in the absence of a CDM project can never be answered with complete certainty as a hypothetical development has to be assessed: what would the emissions of a normal plant have been compared with the modern plant planned under a CDM project? Acceptable methods for **baseline** emissions calculation either remain to be developed or the decision on their use still has to be taken. The Marrakech Accords of 2001 allows three basic baseline options that are illustrated by the example of substituting an old coal power plant by a modern plant financed through investment from an industrialised country.

B o x 3

The project documentation has to be checked by an independent, officially accredited certifier before the application for **project registration** can be submitted to the international CDM Executive Board. The Board will publish the documentation inter alia on its website [www.unfccc.int/cdm](http://www.unfccc.int/cdm) and collect **comments** from the public. After the project - possibly after review - has been approved and thus **registered** by the Board, it can be implemented. The **verified** data on baseline and project emissions will be submitted to the CDM Executive Board from time to time. The Board then issues the respective **emissions credits** to the project participants after having deducted the "adaptation tax" of 2%. This tax will be used to finance adaptation projects in developing countries that are particularly vulnerable to global climate change.



1 In choosing a baseline methodology for a project activity, project participants shall select from among the following approaches the one deemed most appropriate for the project activity, taking into account any guidance by the executive board, and justify the appropriateness of their choice:

(a) Existing actual or historical emissions, as applicable; or

(b) Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment; or

(c) The average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category. *Source: UNFCCC/CP/2001/13/Add.2.*



An important CDM rule states that funds shall be additional and funding through official development aid is not possible (see Box 5).

### Additionality of funds

CDM projects shall not lead to a **diversion of development aid**; industrialised countries shall provide new funds for CDM projects. The implementation of a CDM project with partial development aid financing thus needs an analysis of additionality of costs. The additional costs related to the emission reduction component of the project have to be assessed. They cannot be financed by development aid if the project is to generate emissions credits.

Box 5

CDM projects can be implemented in many different **institutional designs** - the most common are **bilateral** models involving an industrialised and a developing country as well as **funds**. Some financial service providers have already developed such funds. The most renowned is the Prototype Carbon Fund of the World Bank that has already concluded contracts with a number of projects to purchase the emissions credits achieved after certification. The World Bank will open further specialised funds for forestry sinks projects and small-scale projects with positive development impacts in early 2003 (see Boxes 6 and 7).

The Kreditanstalt für Wiederaufbau (German Financial Cooperation - KfW) envisages setting up a CDM/JI fund in cooperation with the German government. Private companies are expected to provide funds; an initial volume of about 50 million euros is expected. The preparations have already begun and in 2004 the first contracts on projects can be concluded.

Besides bilateral and fund models, purely **unilateral** investments by developing countries are also possible.

In many cases it is doubtful that the revenues from the sale of emissions credits can offset the **transaction costs** that have been estimated at several hundred thousand euros. Due to the U.S. decision not to ratify the Kyoto Protocol, the demand for emissions credits has decreased considerably; their price is currently estimated at just 3 to 8 euros per tonne of CO<sub>2</sub> equivalent.

The high transaction costs are generated by the costs of implementing the different steps of the project cycle, such as negotiating the CDM project, defining the baseline and verifying emissions data. Small projects in particular are often unlikely to pass this threshold and are thus to receive special treatment (see Box 6).

### Small-scale CDM projects

- Renewable energy below 15 MW
- Energy savings of less than 15 GWh per year
- Other projects with annual emissions below 15,000 t CO<sub>2</sub>

These can use standardised baselines and are subject to less stringent rules on other steps of the project cycle.

Box 6

2 The emissions of the five classes of non-CO<sub>2</sub> gases covered by the Kyoto Protocol are converted into CO<sub>2</sub> units using specific factors.





## Sinks are a special case

Forestry carbon sinks are controversial in the international climate negotiation process and only partly eligible for CDM projects. Many observers fear that these projects do not achieve a permanent sequestration of CO<sub>2</sub> and only divert deforestation to other locations. In the first commitment period, only afforestation projects are eligible, forest protection projects are excluded. The rules for CDM sinks projects are to be defined by late 2003. Investors thus currently face a considerable regulatory risk.

Those who want to start afforestation projects now should therefore aim at high quality. The German Federal Ministry for Economic Co-operation and Development also recommends certification according to FSC standards.

Box 7



## German assistance in the setting up of national CDM programmes

Many countries in Asia, Latin America and especially in Africa do not have sufficient national capacity to prepare and implement CDM projects quickly. GTZ has therefore participated in a variety of preparatory activities for CDM in developing countries since 1997. The GTZ Climate Protection Programme invites further requests from additional interested countries. An active stance is an important prerequisite, for example indicated by ratification of the Kyoto Protocol. GTZ focuses on building and developing the human resources and institutional capacities of partners and local experts. Ultimately, these national experts and decision-makers should be able to promote use of CDM in their country on their own. Foreign experts shall only be used as short-term consultants. Other, related GTZ projects with long-term consultants help the Climate Protection Programme to steer the projects on the ground and to communicate with the partner organisations. GTZ is interested in cooperating with German industry; the first partnerships have already been sealed.

Details of the incentives offered to CDM investors by the Federal Republic of Germany as well as German rules for approval of CDM projects are likely to be defined by late 2002. Up-to-date information about CDM activities and other projects of the Climate Protection Programme (CaPP) is available from GTZ, Division 44 ([www.gtz.de/climate](http://www.gtz.de/climate)).

## Glossary of most important CDM terms

Emissions credits	Certified Emission Reductions (CERs)
Monitoring plan	Monitoring and Verification Protocol (MVP)
Project documentation	Project Design Document (PDD)
Project lifetime	Crediting Period
Certifier	Operational Entity

Box 8





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