CDM in Crisis – What is at Stake?

A Project Developer's perspective on the past, present and future of the Clean Development Mechanism (CDM)

A paper produced on behalf the PROJECT DEVELOPER FORUM

by

ClimateBridge

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Key points

- *The Clean Development Mechanism (CDM) is the first and only **truly international greenhouse gas mitigation compliance scheme,** and has been a success in promoting clean energy investments in the developing world. CDM projects represent a **combined investment in clean energy and low carbon technology of $215-450bn**. Projects are concentrated in the major emerging economies, where emission reductions are needed most.*

- *The CDM has led to the **establishment of institutions** required to carry out **the monitoring, reporting and verification (MRV) of emissions** in developing countries. A **network of consultants, investors, verifiers and government officials** now exist in all major developing countries, which has facilitated the introduction of emissions trading schemes.*

- *The CDM, through development of norms on **emission calculations**, **baselines, additionality**, stakeholder consultation etc. has laid a **foundation for future climate mechanisms**, and new initiatives. Any **New Market Mechanism** will need to use the knowledge and expertise acquired from the CDM, to ensure these new mechanisms deliver **robust emission reductions**.*

- *The CDM has **strict controls for ensuring projects represent real emission reductions**, and the additionality tool has grown increasingly stringent over time. Whilst it is impossible to ensure that no projects that may have happened without CDM receive carbon finance, the **CDM additionality test is the strictest of any mechanism**. Moreover **conservative** principles are implemented throughout the CDM, **further reducing any potential over-crediting**.*

- ***The CDM is currently in crisis**. Low carbon prices threaten the **bankruptcy of project owners**, and **hardly any new projects** are being developed, even in **least developed countries**. Moreover potential trust from energy firms and entrepreneurs in the developing world that international finance mechanisms will deliver real, long term funding in the future, is being eroded.*

CDM in numbers

5,000+	Registered projects
1 billion+	CERs issued
5.4 billion	Registered emission reductions
$215-450bn	Investment leveraged
181 GW	Renewable energy projects registered to date
129	Non annex 1 DNAs established
99	Host countries with active projects
171	Baseline and monitoring methodologies

SECTION 1: CDM's success at leveraging low carbon investment

Over the past 14 years, the CDM has emerged as the world's largest carbon finance mechanism and has driven $215-450bn investment into renewable energy and low carbon projects. Investment has been concentrated in major emerging economies, where emissions growth most needs to be slowed, and in renewable energy, critical for decarbonising the global power sector.

The Clean Development Mechanism (CDM) has leveraged between $215bn-450bn of investment in clean technologies in developing countries.

The CDM has been a cost-effective way of unlocking large flows of clean tech investment. Hosier et al, (2010) and Stadelmann et al (2011), estimate that for every $1 of carbon finance, $4-10 is leveraged. CDM provides an affordable way to encourage low carbon investment in the developing world.

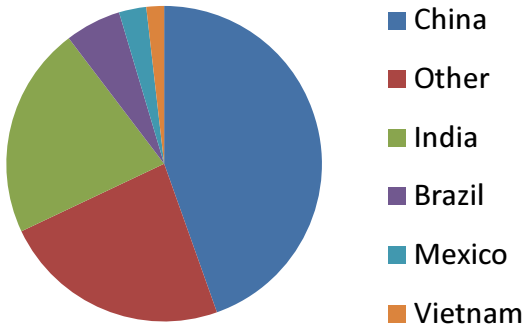
CDM has been larger than any other developing country climate financing mechanism. No other mechanism has managed to scale-up in the manner that the CDM has. Over its 30 year life time the World Bank's Global Environmental Facility has financed $2.7bn of projects in developing countries, a fraction of the amount leveraged by CDM in its 10 year existence. The 5,000 registered projects represent over $215bn of new investment, while if projects still at validation are included the figure is well over $450bn (UNEP Risoe).

Emerging country finance institutions have provided capital to clean energy projects. In the majority of cases, debt funding for CDM projects has come from lending institutions in emerging markets (Michaelowa, 2012). The CDM has unlocked large amounts of emerging market capital and these banks have increased their experience in clean energy project finance based on carbon price signals.

CDM finance has driven low carbon investments in the fast-growing economies, like China and India, where the need to slow emissions growth is most critical.

Over 70% of investments in CDM are concentrated in Brazil, India or China (the 'BICs'). Table 1 depicts leveraged investment per country for all active CDM projects.

Table 1: Split of total CDM investment by country



Source: UNEP Risoe

The largest portion of future global emissions growth to 2030 is predicted to occur in the BIC countries. Even if developed countries reduce their emissions to zero, if emissions continue to grow in the BICs in line with the baseline scenario, global temperatures will still rise well above 2°C. Supporting climate action in these countries is therefore critical. According to a recent study, China is estimated to require a massive $280bn of investment per year by 2030 in order to keep global emissions below 2°C (McKinsey, 2010).

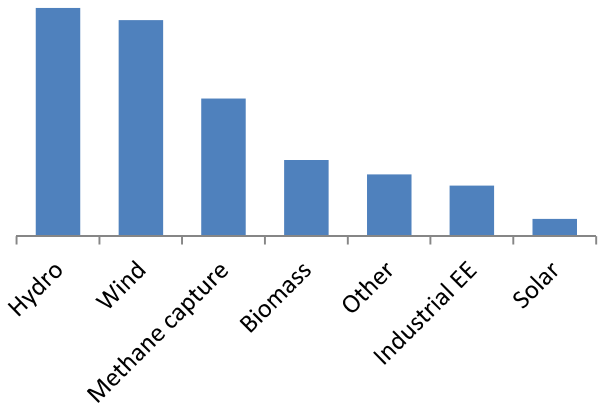
Development of low carbon industries today has a catalytic effect on further projects. Large increases in clean energy capacity, driven by the CDM, have resulted in the development of a renewable energy industry in the major emerging economies. For example, five of the top ten global wind turbine manufacturers are now either Indian or Chinese (IHS, 2012).

CDM has also helped leverage $65bn in Africa and Latin America (ex. Brazil). Whilst the BICs have been the largest beneficiaries of CDM, the investment into other parts of the world has still been significant. (UNEP Risoe)

Renewable energy has been the largest benefactor of CDM finance, critical technologies required to solve climate change.

Renewable energy constitutes more than 70% of the investment leveraged by the CDM. Hydropower, wind and biomass are the most common clean energy technologies.

Figure 2: No of CDM projects by technology



Source: UNEP Risoe

Financing large scale renewable energy is critical in slowing emissions growth. To tackle climate change, we need to decarbonise the global power sector. In China and India over 75% of electricity is currently produced from coal. Achieving a transition towards renewable energy in these economies is arguably the most important challenge the world faces in tackling climate change. CDM is playing a role in putting China and India on a lower carbon trajectory.

Innovative new technologies have also been developed under the CDM. Cutting edge technologies have been transferred to developing countries. The CDM has led to pioneering coal mine methane capture projects that both reduce emissions and improve mine safety. Fuel efficient cookstoves and solar-based water purification systems result in a fall in GHG emissions, a slowdown of deforestation, and a reduction in indoor air pollution, in some of the world's poorest countries.

The number of household level projects has grown rapidly, with the introduction of PoAs (programme of activities). After a slow start, there are now more than 900 PoAs under development (UNEP Risoe), with the majority of projects at household level. Solar lighting, cookstoves and domestic manure biogas are particularly popular PoA project types.

The CDM is also a mechanism for industrialised countries to lower the cost of meeting their climate mitigation targets. The CDM has helped save Annex I over $3.6bn.

The CDM results in significant cost reductions for developed (Annex 1) countries. Given limited resources available to pay for climate change mitigation throughout the world, it is critical to reduce emissions at the least cost possible. An emission reduction in Tanzania has the same impact as a reduction in Germany. CDM delivers international emission reductions where they are least expensive.

Annex I countries saved $3.6bn in their use of the CDM. By end of 2012, 1.1-1.2bn CERs will have been issued since the start of the CDM. According to the CDM Policy Dialogue the lower bound of estimated savings for Annex I countries through the CDM is €3.6bn (CDM Policy Dialogue, 2012).

SECTION 2: *CDM's institutional legacy*

CDM has to date had a positive impact on global climate change mitigation institutions. In developing countries, CDM introduced explicit carbon pricing, and built the networks and institutions required to monitor, report and verify greenhouse gas emissions. On a global level, the CDM has developed the norms, processes and infrastructure required for future mitigation initiatives, including New Market Mechanisms and the Green Climate Fund.

Capacity building and changes in policy thinking resulting from the CDM has led to the introduction of domestic emission reduction policies in developing countries.

The CDM demonstrates to emerging country governments the value of putting a price on carbon. The CDM has demonstrated that introducing an explicit carbon price results in increased investment in renewable energy and innovative ways to reduce greenhouse gas emissions.

The CDM has built the regulatory institutions required for low carbon development. Emerging economy bureaucracies have strengthened their internal domestic carbon measurement and auditing capability to meet the tough requirements of the CDM. Thanks to the CDM, most major economies have published grid emission factors; essential in establishing baseline emissions for any emissions trading scheme or carbon tax.

An industry of environmental consultants and auditors has emerged to monitor, report and verify greenhouse gas (MRV) emissions. The major international environmental auditing organisations have all established greenhouse gas verification offices in the large emerging markets. These firms will be able to verify emissions to international auditing standards in any future carbon trading scheme in these geographies.

Major energy firms in developing countries now have in depth expertise on emissions trading. In all major developing countries, the largest power companies (e.g. Tata, Datang and Petrobras*)* have implemented CDM projects, giving experience of development of renewable projects, as well as how to deal with explicit carbon pricing and emissions trading, as well as international standard MRV.

Learning from the CDM, China will begin a series of pilot emissions schemes in 2013-14, which collectively will be the world's second largest trading scheme in the world. The offsetting component of the pilot schemes explicitly uses CDM methodologies and norms.

Emission trading schemes are emerging in South Korea, Brazil, Thailand and Vietnam. All major beneficiaries of the CDM are launching their own trading schemes. The South Korean scheme is scheduled to start in 2015. The Brazilian metropolises of Sao Paolo and Rio de Janeiro will also be launching pilot emissions trading schemes. India's energy efficiency PAT trading programmed launched in 2012.

At the international level, the CDM has led to the development of rules and frameworks.

More than 170 methodologies have been established under the CDM. From anaerobic digestion to water purification, the UNFCCC has approved procedures to measure the carbon impact, prove the additionality, and monitor

emissions from a wide range of environmental action. All future mechanisms will rely on CDM approaches, and the current methodologies already influence schemes elsewhere, such as the Carbon Farming Initiative in Australia and the Californian Emissions Trading Scheme.

The UNFCCC CDM Executive Board and secretariat architecture has been established to assess finance for emission reduction projects. The Secretariat staff has grown from a hand-full to over 100 professionals and can handle large volumes of project cases at any given time. Moreover processes have been refined, with reductions in timelines over the CDM's lifetime.

The CDM created a network of environmental verifiers, the Designated Operational Entities (DOEs). These entities (typically major audit and certification firms) provide third party validation of all CDM projects, and have grown in their expertise and quality over the last decade. By training thousands of verifiers in carbon management, DOEs have diffused environmental auditing skills in both the developing and developed world.

Project developers provide expertise and link together investors, project owners and technology providers from around the globe. A new type of company, the CDM project developer, has emerged to act as the oil between the cogs, by finding emission reduction opportunities and technologies, arranging finance, and entering into BOT contracts to build and operate projects before handing them over to host country participants.

Other climate regimes, such as New Market Mechanisms, the Green Climate Fund, and credited NAMAs will be able to build on the experiences and architecture of the CDM.

New Market Mechanisms (NMM) should build on the experience of CDM. Any NMM will face the same complex issues that CDM projects face; establishing a baseline, determining additionality, ensuring stakeholder involvement and sustainable development. Indeed several studies (e.g. KfW 2012) have pointed out how a CDM PoA can be turned into an NMM or credited NAMA (see case study overleaf).

The Green Climate Fund (GCF) can also learn from the CDM. The Green Climate Fund held its first meeting in late 2012 and aims to efficiently manage the flow of funds towards mitigation action in developing countries. This allocation of funds will require very similar expertise and involve similar challenges to the CDM and the GCF can study and use the CDM architecture.

Other mechanisms will take too long to deal with the climate crisis if they are built from scratch. The CDM took 14 years to mature to the scale it is today after significant teething problems, particularly in the early years. If NMMs and the GCF fail to build on the CDM, they will take a similarly long time, too slow to tackle required emission reductions, which requires drastic action now.


Photo: Climate Bridge

New market mechanisms and the CDM

Since 2008, Parties have supported the concept of 'new market mechanisms' (NMMs), to help attract private sector finance and increase mitigation ambition. In Durban, Parties defined the new mechanism and agreed to elaborate further on its operational aspects.

Numerous studies (e.g. Fussler 2012, KfW2011), have explained that the **CDM could readily be used as the basis for NMMs**. Indeed, the key components of NMMs have already been tested in practice under the CDM:

- **Standardised approaches:** The CDM already uses standardised approaches, e.g. for default emission factors in the energy and industrial gas sector. The UNFCC secretariat is currently further refining the rules on standardised approaches within the CDM.
- **Beyond project mechanisms:** The CDM has historically been a project-by-project mechanism. However there are now 900 Programme of Activities in the CDM pipeline. These programmes, often at a sectoral level, provide a template for expanding site specific activities into multi-site and multi-technology interventions.
- **Credited NAMAs:** Credited NAMAs already exist thanks to the CDM. For example in the Chinese wind power sector, CDM together with feed-in tariff support from the Chinese government has created the largest wind sector in the world. On the back of the synergy between the CDM and national investment incentives Brazil is now building more than 5 GW in wind generation capacities.
- **Net positive emissions mitigation impact**: The CDM is not *per se* an offset mechanism, it is the **use** of CERs that determines whether or not a CDM project is offsetting. A CER is effectively a mitigation investment in developing countries. Further, net mitigation impacts already exist any time the benchmark is more ambitious than the business as usual scenario. As an example, the Finnish government credits ERUs to its domestic N2O mitigation projects only below an ambitious benchmark. CDM can also easily be adapted to have a net positive emissions mitigation impact.


Photo: Tricorona

SECTION 3: *Environmental integrity*

The rules of the Clean Development Mechanism have been refined and strengthened over time. The additionality tool is the strictest of any offset mechanism, and has grown increasingly robust. In addition the CDM has placed unprecedented scrutiny on stakeholder consultation, and steps continue to enhance environmental integrity.

Whilst it will always be difficult to avoid non-additional projects, the CDM has a higher level of stringency than any other mechanisms with multiple independent checks.

Additionality is a key component of CDM. When used as an offset mechanism, the CDM needs to ensure that every CER represents a real reduction in emissions. If projects are non-additional, global net GHG emissions will rise.

The UNFCCC's additionality tool has grown increasingly complex and robust over time. Project owners must demonstrate that without CDM finance the project would be unviable by building a financial model. Every input from that model needs to be supported with third-party documentation. A verifier cross references all inputs with a database of other similar planned *and implemented* projects. The project owner must also demonstrate the project is not common practice, and that evidence exists that CDM revenues were assumed in the investment decision.

Multiple checks, from independent verifiers, the UNFCCC and national governments mean that CDM projects are carefully verified. DOEs (independent verifiers) crosscheck every single figure and statement in the project design document (PDD) with real evidence. The UNFCCC repeats all checks. Global stakeholders are also able to question assumptions made by project developers. See the diagram below to show the full validation process for a CDM project. Post registration, projects are checked to ensure they do not deviate from the original plan and are re-assessed if they do.

The CDM adopts a conservative approach throughout its cycle, further reducing the risk of over-crediting. Real project lifetimes are usually longer than the CDM. For example hydropower projects can last up to 50 years, whilst the crediting period is 10 or 21 years. Moreover conservative assumptions are taken in all methodologies for calculating emission reductions. For example conservative default values are always applied to transmission losses, grid emission factors and flare efficiency.

The CDM involves unprecedented levels of stakeholder consultation, which is continuously improving.

A local stakeholder consultation must be organised for every CDM project. A meeting that documents how the local community feels about the project and how their concerns are taken on board by the project proponents must be held near the project site.

A stakeholder consultation in China

Any global stakeholder is able to query the project through the Global Stakeholder Process. Anyone can make comments on a project via the UNFCCC's public website. These concerns then must be investigated by the third party verifier, the DOE.

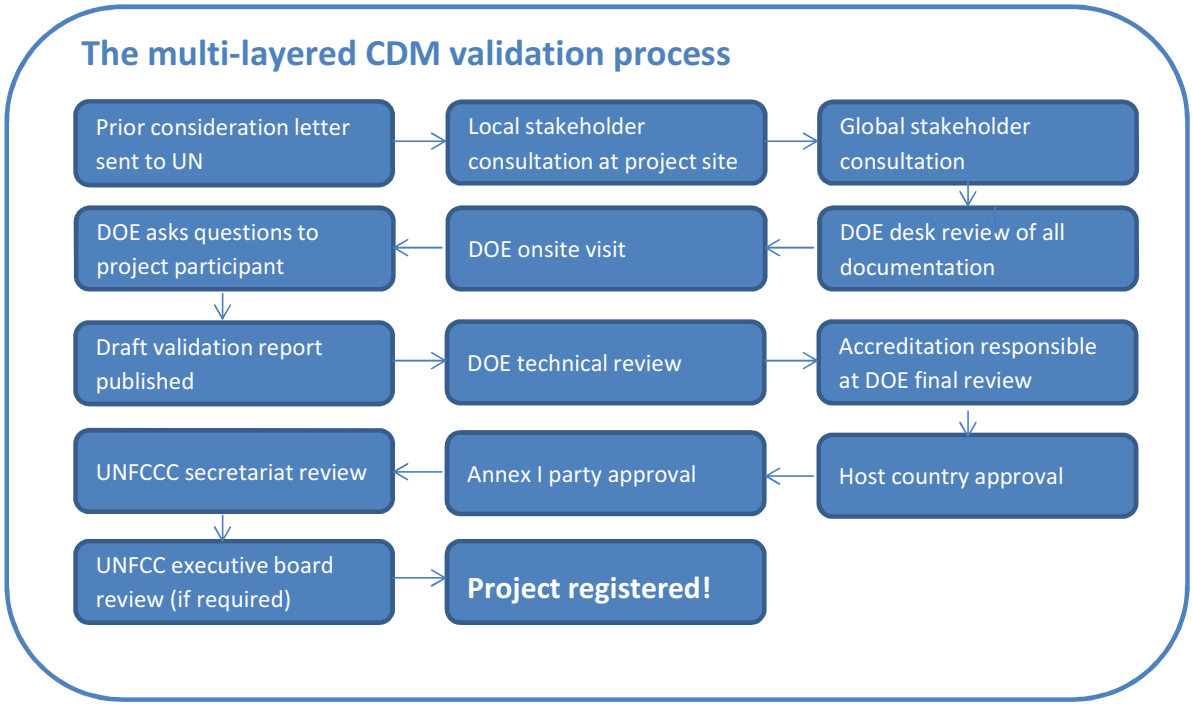
The host country must give its approval that the project meets sustainable development goals, and that the project is in line with national laws and regulations**.** Without official approval from the host country, a project cannot receive carbon finance.

The UNFCCC secretariat has recently introduced a sustainable development tool, in order for project participants to better track sustainable development attributes of projects.

New appeals processes are being introduced to further enhance environmental integrity

An independent appeals process is under development by the UNFCCC secretariat. This should allow stakeholders to appeal against both positive and negative decisions of the CDM, to ensure only the correct amount of emission reductions is credited.

The UNFCC is fortifying procedures to improve the mechanism's integrity To ensure the verifier, the DOE, effectively scrutinises projects, the UNFCCC will be able to impose greater penalties on DOEs if they find 'significant deficiencies' occurred during the validation process. Whilst the rules on this process need to be constructed to ensure DOEs are not driven from the market, the procedure will further improve environmental integrity.



SECTION 4: *The current crisis in the CDM*

As the CDM Policy Dialogue's 'Call for Action' proclaims, the current extremely low CER price, and lack of demand from outside the EU-ETS, is having a disastrous effect on the CDM. The effects of a continuing lack of demand will have dire consequences for the mechanism, and broader global climate change mitigation.

The low price and lack of demand is having huge effects on low carbon investment

Project owners are going bankrupt, particularly for developers where CDM income represents a large proportion of total revenues (e.g. methane capture projects). Dozens of projects have already stopped operating, unnecessarily increasing emissions into the atmosphere, and slowing down low-carbon transformation in developing countries. See case studies overleaf for details. This puts into jeopardy a significant portion of the 5.4bn tonnes expected to be reduced by the CDM between 2013 and 2020 (CDM Policy Dialogue, 2012).

No new projects, not even in least developed countries, are being launched. With carbon prices below one euro, hardly any new projects are being developed under the CDM. This includes projects in least developed countries, which are strongly encouraged by all Parties.

The longer term impacts of low carbon prices are even more damaging for future mitigation

Fall in prices betrays the trust of developing country governments and project owners. The mission to build a global low carbon economy is far from over. However with the collapse in prices and support for CDM, developing country governments, energy firms, financial institutions, investors and cleantech entrepreneurs will have little trust in future regimes. It will justifiably make them shy about engaging with future global environmental mechanisms, and set us all back significantly in the crucial effort to rein in the growth of emissions in the developing world.

The significant human resource and institutional capacity continues to be lost, weakening future climate regimes. The network of consultants, verifiers and regulatory bodies has already halved in the last two years and will entirely evaporate if CDM scales down. In particular the 'learning-by-doing' of CDM practitioners in the last decade will be lost. All other mechanisms, such as new market mechanisms will face similar challenges that the CDM has been contending with for the last 10 years**.** Losing CDM expertise will hamper these new mechanisms

The next stage of carbon market development will be harmed. In the long term, a gradual transition to a global cap-and-trade scheme is a critical element of an effective response to climate change, and lessons learnt through the CDM will be crucial in developing such a system. If the CDM dies, that knowledge will be lost.

Project case studies

Case Study 1: Solarwave Water Purification in Tanzania

Project developer: Tricorona
Project Description The project uses solar water purification technology to provide drinkable water to schools and hospitals in rural Tanzania. Previously water was purified using unsustainable biomass which not only directly emits greenhouse gases but also leads to deforestation.
Technology transfer: The system uses Swedish water purification technology.
Result: The project has so far delivered close to a million litres of purified water. Reports on the ground suggest the rates of diarrhoea epidemics have fallen massively.
Impact of low CER prices 10 units were installed with initial funding from Tricorona, but low CER prices mean that no new investor can be found for the next 10 units. The expansion of the project has halted.

A **video** of the project can be found here

Case Study 2: Ventilation Air Methane in China

Project developer: Sindicatum
Project Description: The project destroys low concentration methane that would otherwise be vented to atmosphere. Ventilation air methane (VAM) is by far the largest source of methane from coal mining operations worldwide, and the largest VAM emitter is China.
Technology transfer: The project uses internationally sourced catalytic and thermal oxidization technology, and China now has more of these installations than any other country.
Impact of low CER prices All of the revenues from this project were due to come from CDM finance. Future projects of this technology will not be viable without CDM finance, and if the CER price remains low, this project will be heavily loss making. Other VAM project developers are reported to be in deep financial trouble, cancelling projects or not capturing the VAM from the projects. If carbon prices were higher, more expensive equipment would be used to generate electricity, which would displace electricity from the coal-intensive grids.

SECTION 5: *A call for action*

To quote directly from the independent high level panel on the CDM Policy Dialogue report:

"The world faces an unprecedented triple threat on climate change – an unfortunate confluence of three corrosive trends:

1. The Earth's climate system is on a precipice, with **staggering impacts of climate change already felt around the world**. From devastating droughts, floods and extreme storms to rapid ice melt, **climate change is already here and about to get much worse.**

2. I**nternational climate action is falling far short** of what the world needs to avoid potentially unmanageable consequences. **Nations are doing only slightly more than half** of what the world needs now.

3. **Global carbon markets** – an important policy instrument that the international community has developed over the past decade to facilitate real-world emissions mitigation **– are collapsing with potentially devastating consequences**. This is particularly true of the world's largest carbon market designed specifically to link developed and developing countries, an instrument operated by the United Nations known as the Clean Development Mechanism (CDM)."

To diffuse this triple threat, the international community must act quickly and decisively."

At the forthcoming COP meeting, the PD Forum calls on delegates to:

1. ***Recognise the increasing evidence of the link between GHG emissions and the frequency and severity of extreme weather events as contrasted against Parties' levels of ambition***

2. ***Increase demand for CERs to maintain and promote the CDM through the adoption of tougher caps for Annex 1 Parties and by extending the use of CERs to all Parties***

3. ***Urge Parties to continue their support for the CDM as a key step in preparations for market readiness***

4. ***Support proposals for a CDM Fund or Reserve Facility to purchase CERs from existing projects in the absence of sufficient global demand***

Please act now!

About the Project Developer Forum

The Project Developer Forum (PD-Forum) is a collective voice to represent the interests of companies developing greenhouse gas (GHG) emission reduction projects in international markets under the Clean Development Mechanism (CDM), Joint Implementation (JI) and other carbon emission reduction schemes and programs.

The PD Forum's primary aims are to:

- improve the efficiency, legitimacy and functioning of the regulatory systems governing the development and use of emission reduction projects,

- influence policy developments and regulatory standards related to emissions trading and emission reduction projects,

- update and support independent standards and codes of conduct in order to further improve the integrity of the industry.

The PD-Forum is active in communicating with regulators at national, supranational and international levels and other project developers about the rules and regulations governing emissions trading and emissions reductions projects.


Photo: Tricorona

Bibliography

CDM Policy Dialogue research team, *A Call to Action: Report of the High-Level Panel on the CDM,* 2012

CDM Policy Dialogue research team, *Assessing the impact of the Clean Development Mechanism,* 2012

Fussler, *CDM baseline approaches for POA upscaling and New Market Mechanisms*, 2012

Hosier, R., Kulichenko, N., Maheshwari, A., Toba, N., and Wang, X. *Beyond the Sum of Its Parts: Combining Financial Instruments, for Impact and Efficiency*. Washington, D.C.: The World Bank, 2010

IHS Emerging Energy Research. *Gamesa back in wind top-five as GE drops out*, 2012.

Mckinsey, *Impact of the financial crisis on carbon economics: Version 2.1 of the global greenhouse gas abatement cost curve, 2010*

Michaelowa*, Strengths and weaknesses of the CDM in comparison with new and emerging market mechanisms,* policy paper for the CDM policy dialogue, 2012

OECD, *OECD Environmental Outlook to 2050 – Climate Change chapter,* 2011

Stadelmann, M., Michaelowa, A., Butzengeiger, S. and Köhler, M.*,. Universal metrics to compare the effectiveness of climate change adaptation projects.* Colorado Conference on Earth System Governance: Crossing Boundaries and Building Bridges, 2011, Colorado State University, 2011

UNEP Risoe, *CDM and PoA project pipeline,* Accessed 10 November 2012