

Overview of the CDM and Bali's outcomes

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Abstract

Fighting Climate Change is gaining momentum among politicians, business men and common citizens: the 13 Conference of the Parties (COP) to the UNFCCC held in Bali in December 2007 have been hailed as the milestone of a future global agreement for fighting global warming involving developing and developed countries.

Bali negotiations provided a common ground for future cooperation, but it was only the first step: the process is due to finish in 2009 within the 15 COP in Copenhagen.

IPCC's fourth assessment report show that humanity should be able to cut GHG emissions by 25-40% by 2020 and in the long run 80%¹ by 2100 to avoid irreversible changes in the climate. Reaching these goals is an ambitious task in terms of stringency of the needed actions: if actions will be delayed the chance to reduce reverse impact of Climate Change are slim.

The second time constraint is related to the economic laying behind Adaptation and Mitigation: world's rapid economic growth will lead to a fast increase in GHG emissions. The investment decisions are taken today and will shape future emission trends for the next decades: it is necessary to redirect the financial flows towards less carbon intensive alternatives. Business community needs a clear framework and a certain future on international and national regulations. Without certainty on the future existence of a global agreement on Climate Change, the majority of the investments will support traditional patterns of producing and using energy in every sector.

Time is the actual scarce resource: there is no more room for talking without effective actions.

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¹ Both data refer to 1990 levels.

Keywords: Carbon market, CDM, flexibility, Certified Emission Reduction, Bali, post 2012 agreement, Program of Activities

1. The Clean Development Mechanism

The Kyoto protocol comes in force

The Kyoto Protocol was adopted at the third session of the Conference of the Parties, under the United Nations Framework Convention on Climate Change (UNFCCC), on December 1997.

As a consequence, Greenhouse Gases (GHG) reduction goals have been established for 38 industrialized countries and for 11 countries located in Central and Eastern Europe². The overall target, for the Annex 1 Parties, is to cut down, in the period 2008-2012, GHG emissions by an average of 5.2% below 1990 levels.

The Kyoto Protocol comes in force only in on February 2005 with the acceptance of Russia, reaching the amount of 55% of global GHG emissions.

The Protocol, in the pursue of providing instrument to cut down the cost of reducing the GHG's emissions and in order to attract investment from the private sector, established three flexible mechanisms, namely:

- Emission Trading (ET)
- Joint Implementation (JI)
- Clean Development Mechanism (CDM)

Final rules and structure of a CDM project

Final rules for CDM were agreed during the COP 7 at Marrakech in 2001. CDM allows actors (public and private) operating into the Annex I Parties to obtain emission reductions from implementing projects (CDM projects) in order to reduce GHG emission in Developing Countries. The only restriction for CDM projects is the non use of Nuclear Energy. No other sector is banned: fuel switching, removable energies, landfill, chemical, construction etc. are all practicable. No restriction on the nature of the project is provided for potential CDM projects, but the host country has to validate the projects and to notice non-conformity or other incompatibility in the projects.

In any case, path to approval of a project is long and complex. A project can be considered "admissible" if three fundamental criteria are satisfied:

- ✓ Both host and investor countries must had ratified the Kyoto Protocol and had to identify a Designated National Authority (DNA) who is responsible at the national level for all the issues related with CDM
- ✓ The project has to be additional. It has to generate GHG emission reduction which would have not take place without the project
- ✓ The project has to contribute for sustainable development of the hosting country. The CDM's aim is not only to help Annex 1 Parties to accomplish their emission reduction target. One fundamental aspect of CDM is to introduce a sustainable path of development among Non-Annex 1 Parties

² In the following years almost all the countries joined the Protocol. Australia signed the Protocol during the COP/MOP held in Bali. Only the United States (and 17 developing countries plus Turkey and the Vatican City) are still refusing to sign the Protocol.

The procedure provides for Project developer to produce a Project Design Document (PDD). This document has to contain information about:

- General features of the project
- Baseline Methodology (the methodology used to determine the Business As Usual Scenario -BAU-, that is the emission level which would have been registered without the project)
- Crediting Period (a project, apart from its expected life, can generate reduction for 10 years -fixed period- or for 21 years -7x3, variable period-. In this case the methodology in use for determining the baseline must be revised every 7 years.)
- Monitoring methodology and plan of the emissions
- Calculation of GHG emissions by source (obtainable by the project)
- Environmental impacts
- Stakeholders comments

Bodies overseeing the CDM process:

Designated National Authority (DNA) for the CDM

The DNA is the focal point for CDM matters in a country. It is frequently a unit in a government ministry that is responsible for administering CDM implementation and overseeing approval of projects.

Designated Operational Entity (DOE)

DOEs are accredited by the Executive Board and perform two functions: validating CDM projects, verifying and certifying emissions reductions from projects. The same DOE cannot perform both functions for one project unless it is a small-scale project. Up to today there are only 18 DOEs acting on the market, even if the CDM EB is evaluating new applications worldwide. The small number of DOEs could be a problem, because if on one hand guarantees the professional competence of these actors (it is required a high standard to become a DOE), on the other hand could produce some delay due to the large number of CDM project monitored by few DOEs.

Executive Board (EB)

The CDM Executive Board supervises the CDM and makes the final decision about project registration and the issuing of carbon credits. The Board also makes the final decision whether to approve new baseline and monitoring methodologies and must approve new DOEs. The Board was elected at the Marrakech Conference of Parties in 2001 and has 10 members from Parties to the Protocol.

Project Design Document

Project Design Document (PDD) must be transmitted to a Designated Operational Authority (DOE) that has validated it. DOEs are private actors that can operate on a national or international level, accredited by the Executive Board (EB) of the CDM (it is the supervisor body for the CDM) which resides in Bonn, and by the COP for the final accreditation.

In case the Project proponent provides a new methodology to calculate the Baseline or for the monitoring, the new methodology must be proposed in the PDD, then verified and accepted by the EB. Then DOE can submit the PDD for registration.

DOE transmits the PDD to the EB that has to register it. Registration has the same significance of

a formal acceptance of the project by the EB.

Once the project goes through the implementation phase, a DOE (different from the one who validated the project) verifies the real achievement of the expected emission reduction, basing on the monitoring data. Hence, DOE produces a “certification report” that is transmitted to the EB and that represents the formal application for the issue of the Certified Emission Reductions (CERs). Once obtained, a CER is freely negotiable.

Small Scale Projects

The Marrakech Accords created a separate category of CDM projects called “*small-scale projects*”, for which the validation requirements and procedure are simpler. Environmental assessment and stakeholder participation are the same than a normal project, though.

Small-scale projects are defined as:

- Renewable energy projects with a capacity of less than 15 MW ;
- Energy efficiency projects that reduce consumption by the equivalent of 15 GWh/year ;
- Projects that both reduce emissions by sources and directly emit less than 15 kilo tonnes of CO₂/year.

2. Flexibility is the key

The Flexible Mechanisms success

The main success of the Kyoto Protocol has been the introduction of flexibility in companies' strategy. Emission Trade and Project-based activities gave companies the chance to shape their strategy in a sophisticated way, both geographically (implementing activities where the marginal costs are lower, i.e. through CDM) and through time (bankability of CERs, bankability of EUA after 2012, hedging).

The foundation of the flexibility lays in the creation of a relatively stable carbon market. It has the major function of facilitating the transaction between supply and demand: the existence of a price for the CO₂ allows buyers and sellers to develop more sophisticated transactions and advanced carbon deals, using a wide range of derivative instruments. CO₂ is now a tradable commodity, with its own price, traded in several different marketplaces in the world. As it happens in any other commodity market, actors are now able to design their strategy to comply with the emission limitations with some flexibility. Since price exists and the market has reached a relative stability, actors can also play for pure speculation, trading carbon reductions and Allowances.

Beside the economic implication of the carbon market, under the environmental point of view it brought some positive results among private companies: the environmental integrity of a company activity is becoming more important and the reduction of GHG emissions is also included in the top management priorities. Since CO₂ has a price, reducing emission is an opportunity to improve the overall economic performance of one company and internal abatement actions and measures are implemented more often³.

Moreover, considering the high media coverage and increasing public feeling for the Climate Change issue, it is becoming necessary for the companies to implement some kind of

³ According to Point Carbon data, in 2006 almost 65% of the companies covered by EU ETS started to implement internal abatement measures, with a remarkable growth from the 15% registered in 2005.

environmental policies, mainly for GHG emission reduction. Even firms not covered with binding limitations are willing to offset their emissions purchasing Emission Reductions generated from projects under voluntary schemes.

The creation of a carbon market imply the possibility for private companies to invest in less carbon intensive projects and technologies, attracting financial flows that otherwise would support traditional investments in terms of GHG emission and carbon reductions.

Where is the carbon market going?

It is useful to divide in two categories the nature of the transaction in the Carbon Market: Allowance Based (mainly Assigned Amount Unit, under the Kyoto Protocol Framework and European Assigned Unit, to be used under the EU ETS scheme) and Project Based⁴ transaction (namely emission reduction generated by CDM and JI).

In this work the main focus will be on the second type of transaction, but is necessary to consider the interactions between the two transactions and the influence EU ETS and AAU on the price of the project based emission reduction (Certified Emission Reduction, and Emission Reduction Unit⁵).

Global Carbon market exceeded 2.6 Gt, worth 40 Billion € Since 2006 it grew by almost 80% in value and 64% in volume.

Tab. 1: Carbon Market growth. EUA total includes an estimate of bilateral volumes (not shown). Source: Point Carbon

	2005		2006		2007	
	Mt	M €	Mt	M €	Mt	M €
<i>EUA TOTAL</i>	362	7, 218	1017	18, 143	1643	28, 133
<i>OTC</i>	207	4, 269	627	11, 180	1009	17, 278
<i>Exchanges</i>	55	1, 131	190	3, 395	434	7, 431
<i>CER TOTAL</i>	401	2, 038	563	3, 920	947	11, 737
<i>Primary</i>	397	1, 985	523	3, 349	597	5, 984
<i>Secondary</i>	4	50	40	571	350	5, 753
<i>ERU Total</i>	28	96	21	95	38	326
<i>Other Total</i>	7.8	52	31	300	48	186
TOTAL	798.8	9, 404	1632	22, 458	2676	40, 382

The largest carbon market is surely the European Union Emission Trade Scheme (EU ETS). It is a cap-and-trade scheme, created in 2005, covering every Member State within the EU and limiting

⁴ As for the “State and Trends of The Carbon Market”, an Allowance based transaction when the buyer purchase an allowance created by national or international governments and institutions; a Project based transaction occurs when a buyer purchases emission credits from a specific project.

⁵ Generated respectively by CDM and JI.

emission in 27 countries, for over 12,500 sites with limitation in several selected sectors⁶. It accounts for roughly 45% of the total emissions in EU.

There are 4 existing Emission Trade Scheme in addition to the EU ETS: Japanese Voluntary ETS, Norwegian system, Albertan Climate Change and Emission Management Act, Regional Greenhouses Gas Initiative in the USA, New South Wales GHG Abatement Scheme in Australia⁷. It must be remembered that these Schemes differs from each other in terms of: sectors and type of gas covered; voluntary or mandatory participation; geographical extension, trading period, use of project-based credits.

The EU ETS started its commitment period in 2008 and it will last until 2012. After the end of the First phase, which ended with extremely low prices mainly due to the over allocation of EUAs, the European Commission set new cut in the National Allocation Plans in order to have stringent targets and to make the market effective. As a result, now EUA are traded with a relatively stable price around 20 Euro⁸. In terms of volume, 1.6 Gt have been traded in 2007, with an increase of 62%. The total value of the market was 28 billion € registering a 55 % increase from 2006.

CERs market saw a fast increase in volume and value: the first grew by 68% while the value folded almost 3 times, up to 11,373 million € from 3,930 million € (199% increase). This exceptional raise is mainly due to the secondary CER market growth during the last year, which grew up to 350 Mt in one year.

On the primary market it is possible to identify different prices for 4 different kind of CERs, depending on the risk the buyer has to bear:

- CERs from non registered projects are worth between 9 and 11 €
- CERs from registered project are paid around 12€
- Issued CERs obviously reach the highest price, between 14 and 17 €

It is interesting to note that prices for issued CERs is slowly moving toward the EAU price, and some analyst foresee a stronger convergence in the next years.

In the last years financial institutions started to operate massively on the carbon market: it brought more funding and more experience broadening the set of options for investors.

Carbon Funds are rapidly increasing in the market: according to Point Carbon 18 new Funds have been established in 2007, increasing the total number to 39, with a current capitalization of 5.6 billion €

3. COP/MOP in Bali: outcomes and pending issues

The Bali negotiations

The annual Conference of the Parties (COP) and the Meeting of the Parties to the Kyoto Protocol (CMP) was expected to bring new strength and a larger agreement among both developed and developing countries on the necessity to fight Climate Change. What has been the outcome? Even if no crucial decision were taken, the negotiations lead to an agreed framework to be used as a

⁶ The covered sectors are: 1- Energy; combustion installation with more than 20MW of thermal input, refineries and coke ovens, 2- Production and processing of ferrous minerals; 3- Mineral industry; Cement, Glass and Ceramic; 4- Pulp and Paper industry.

⁷ There are 2 proposed Trading Schemes to be introduced: in New Zealand and Switzerland. Also Korean government announced its will to launch an Emission Trade Scheme on a voluntary basis.

⁸ The price range in 2007 has been 12.25-25.28 Euro. Source: Point Carbon.

base for further negotiations. There was high expectation around the COP/MOP, due also to the media coverage of the event because of the increasing interest of the public opinion to the Climate Change issue.

Hardly could Bali have lead to an agreement during the 2 weeks negotiations: it was more a preliminary step toward a long negotiation to be concluded in 2009, in Copenhagen. And the final outcome is really an initial set up to start the process, an agreement on the mandate to negotiate the post 2012 framework.

In this sense Bali has produced some important decisions: every country, both developing and developed, agreed on a mandate to fight together Climate Change. For the first time every nation is willing to play its role to fight global warming, according to different conditions and capabilities of each one. Even if quantified goals have been set, the final mandate states clearly the importance of the fourth IPCC report⁹, which identify in the anthropogenic emission of Greenhouses Gases the main cause for the changing of the climate. Many scientists think the main interference with climate, and the risk of having irreversible changes, will start with a rise of more than 2 degrees. Drastic actions and cuts are needed: the IPCC report quantifies the needed cut to emissions should be around 80% to stabilize the atmospheric concentration of CO₂ at 550 ppm by 2100.

Bali's COP/MOP proposed also four building blocks for the so called "Bali roadmap", which should lead to the signature of a world wide agreement for fighting the Climate Change.

The four topics are: Mitigation, Adaptation, Technology Transfer and Finance.

The latter is a key issue in the fight to Climate Change: the International Energy Agency¹⁰ identified in 22 trillion USD the needed investment in the energy sector until 2030, the power sector will account for 11.6 trillion, namely more than an half of the total cumulative investments. The investments will cover the costs to build new facilities and plants, as well replacing the facilities to be closed in the period 2006-2030. If these financial flows will be directed towards traditional technologies and energy sources, the risk is to lock the future emission to a higher level than what suggested by IPCC to reduce global warming. Energy investments have a long economic way, spread over decades. The decision taken today will impact the possibility to curb emission trends in the future years. According to the recent scientific findings, it is not possible to waste such amount of time before talking seriously and drastically the global GHG emissions. We would face the serious risk to have major irreversible changes in climate, leading to changes in wheatear patterns, flooding, faster desertification, reduction of agricultural productivity and loss of biodiversity. The consequences of such scenario are going to influence every country on the planet and the existing geo-political equilibrium.

In terms of GDP, it has been estimated that the cumulative cost for stabilizing the GHG in the atmosphere at between 500 and 550ppm by 2050 is around 1% of the global GDP¹¹, or around 930 Billion USD.

On the other hand, costs associated with non action, with the Business as Usual scenario, show a projection of the cost estimated between 5 and 20 % of the total global GDP.

Assumption beyond models and estimation can vary the results: the only point largely shared is

⁹ The authors of the report have been rewarded, jointly with the former vice-president of the US A Al Gore, with the Noble Prize for peace.

¹⁰ World Energy Outlook 2007, IEA.

¹¹ The actual range estimated is -1% (positive impact) to 3.5% of the total GDP with an average of 1%. Source: Stern Review.

that non acting will lead to an increase of GHG emission due to the growth of the global economy. But the BAU economic scenario will bring high cost in terms of reduction of growth, distribution of welfare, access to natural resources.

The remaining 3 cornerstones, mitigation, adaptation and technology transfer, have been largely discussed in Bali. The main outcomes regard mitigation: the final mandate created some room for global cooperation on mitigation actions. Of the abovementioned 22 trillion USD needed for energy-related investments, developing countries will account for more than an half of the total investments, with China totalling 3.7 trillion (17% of the total figure) India 1.7 trillion (around 8%) and Middle East for 1.9 trillion (less than 9%). In such scenario, it is necessary to involve developing countries in the fight to Climate Change. No matter who has the responsibility for the past emission, what must be taken into account is the future responsibility for emission. Developing country will account for 74% of the total increase in world energy primary demand. No successful environmental policy could reach global benefit without involving India, China, Brazil and the emerging economies. The final mandate in Bali, overcoming severe opposition by different states, creates the floor for future global negotiation on Climate Change including developing countries. Even though no quantified reductions or goals have been neither set, nor the 25-40 % reduction needed to stabilize CO₂ concentration in the atmosphere, nor the 2 degrees limit to the growth of global temperature. The final mandate is the first step towards Copenhagen 2009, where the future post 2012 regime shall be agreed. Developed country shall keep the lead in curbing emissions, but a substantial contribution must be provided by developing countries.

Most of the uncertainty lie on the choice of the best scheme to facilitate and actual implement measure for adaptation, especially in the Least Developed Countries, consolidate and improve the channels for technology transfer, considered a key factor to successfully address Climate Change, and the access to financial resources for implementing the needed actions.

The needed financial flows for Adaptation are very hard to be estimated, due to the fact every region will face different effects of the Climate Change and the range of actions to be put in place is considerably vast. Several actions can be identified and its associated cost has been estimated:

- Agriculture, fishery and forestry (14 Billion USD)
- Water Supply Infrastructure (11 Billion USD)
- Costal Areas Protection (11 Billion USD)
- New infrastructure vulnerable to Climate Change (8-130 Billion USD)
- Disease control, such as malnutrition, malaria (5 Billion USD)

It is important to notice that the majority of those costs will occur in Developing countries, and in most of the cases they will depend largely on public and governmental funding and also will represent a direct cost for families and people affected by the spreading of diseases¹². The Adaptation Fund financed by the share of proceeds of the CDM registered activities (2% of the issued CERs) tries to address this issue, financing project and programmes in Developing countries.

Developing countries stressed also the importance of improve the technology transfer from rich countries, since no substantial results have been achieved so far. Technology transfer is one of the

¹² Source: Investments and Financial Flows to Address Climate Change, UNFCCC, 2007.

key issues to help developing countries to address their emission and to reach sustainability. The diffusion of clean technologies is vital to achieve the required cut to emissions, and it will be necessary to address the technological exchange in an effective way.

CDM in Bali

The negotiation in Bali was also aimed at addressing several pending issues under the CDM and correcting the mistakes made during the first years of operations.

Regarding the pending issues, the hottest topics were for sure Carbon Capture and Storage, HFC₂₃ and LULUCF, while the main adjustment needed concern the geographical and sectoral distribution, as well as CDM Executive Board role and responsibilities, DNA's tasks and liability.

Geographical Distribution

One of the main criticisms moved to the CDM is the uneven geographical distribution of the projects around the world. As shown in Fig 1, the largest number of registered projects is hosted by Asia and South America. Also taking into account the total amount of the emissions, Asia is by far the most important area for CDM with almost 75% of the global emission reduction. In both cases Africa shows a little number of projects and a small amount of emission reduction¹³.

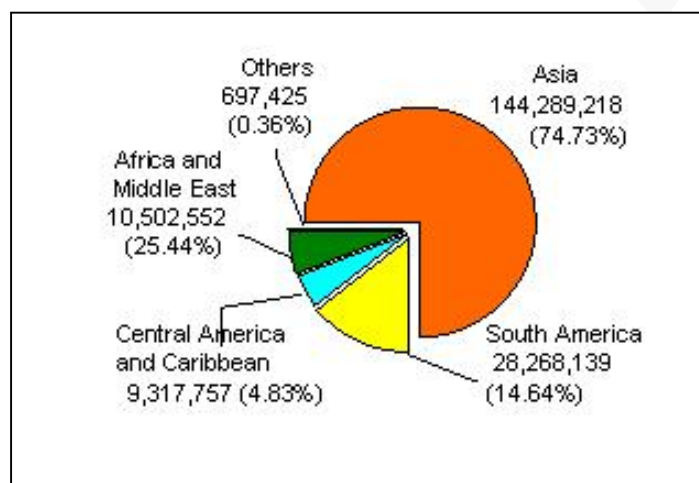


Fig. 1: Registered project distribution region

¹³ Data in this chapter refer to Registered project at the CDM Executive Board, as for February 5, 2008.

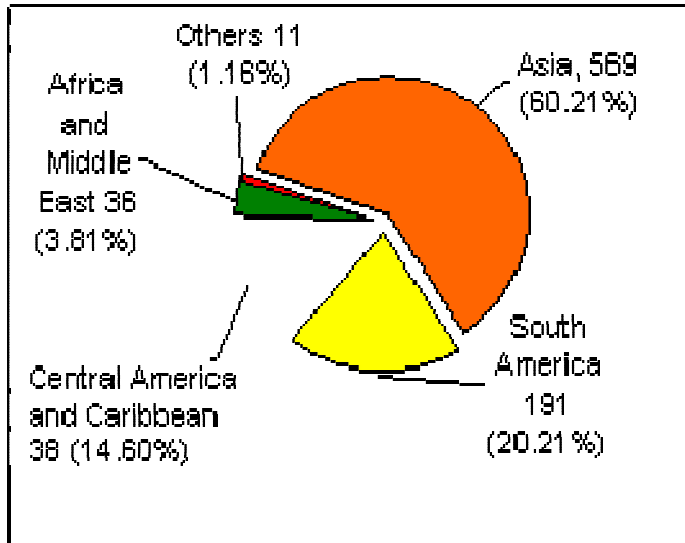


Fig. 2: Emission reductions by area, Mt

The two leading countries at global level are China (91.482.932 Mt of emission reduction with 153 projects) and India (29.026.737 Mt with 306 projects), followed by Brazil and South Korea. Fig.3 shows the top ten host countries, listed by amount of emission reductions¹⁴.

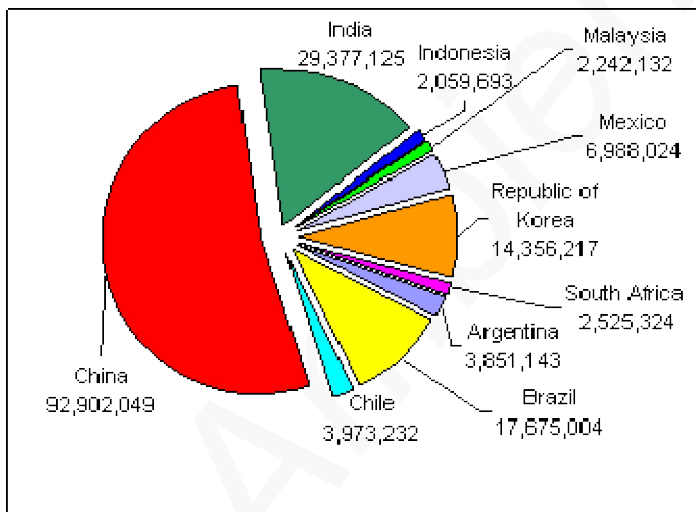


Fig. 3: Top 10 Host countries by emission reductions

This uneven distribution among areas and among countries is not due to reasons strictly related with the CDM process. Africa could be considered as the largest area where CDM failed its mission to deliver sustainable development and attract private and public investments for the environmental protection¹⁵, and these problems are widely spread also in the Least Developed Countries (LDC).

¹⁴ Qatar has been omitted in this list even if with one registered project accounts for 2.4 Mt.

¹⁵ Only South Africa is experiencing a significant development of CDM activities with 22 registered projects accounting for 2.259.864 tCO₂e.

Most of the critics regard the lack of CDM development in Africa; but it should be considered that this continent has never proved itself as the best business environment. The lack of infrastructure, instable political and social conditions, restricted number of internal investors, high projects risks, have always been the reasons keeping foreign investment at a low level compared with the other continents, especially Asia.

In spite of these barriers, even those countries have several opportunities for CDM, mainly in the energy efficiency sector, hydropower, LULUCF and waste management, but seizing these chances is still a risky business. Also from the CDM prospective, Africa and LDC in general, are not the best places where to invest: lack institutional framework, inexperienced DNA, prevalence of small scale potential projects, low rates of electricity access which makes mitigation action more difficult, lack of awareness of the carbon business and of the CDM procedures make these countries way less attractive than Asian countries and South America's.

It is sure that CDM should address the uneven distribution: if the main objective of the Mechanism is to deliver sustainable development and to attract investments for environmental protection: leaving out the poorest countries in the world would mean missing the objective. The moral and ethic principle is very clear and unavoidable; moreover no country will be left untouched by climate change. LDC will be the most affected by the negative effect of the global warming: faster desertification, spreading of lethal diseases such as malaria, lack of access to safe waters will involve millions in developing countries, but the consequences will hit also developed countries. It is easy to foresee massive movement of people from poor countries, increase of mortality, raising international political instability, conflicts to have access to natural resources.

Of course CDM is not going to address all the abovementioned issues nor is going to be the only solution, but could be a useful tool for taking action now and in effective way. But the very basic problem of Africa and of the LDC can not be solved only by CDM. Different international policies, trade schemes, way to conduct business must be put in place.

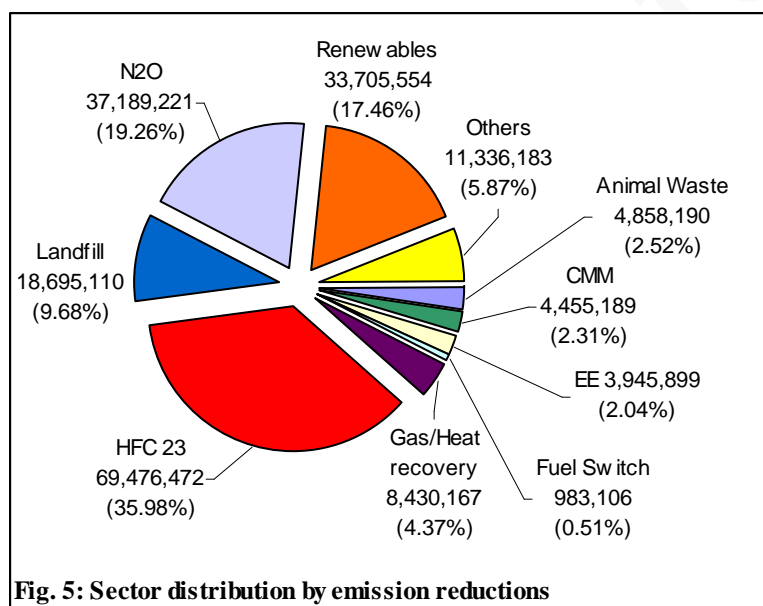
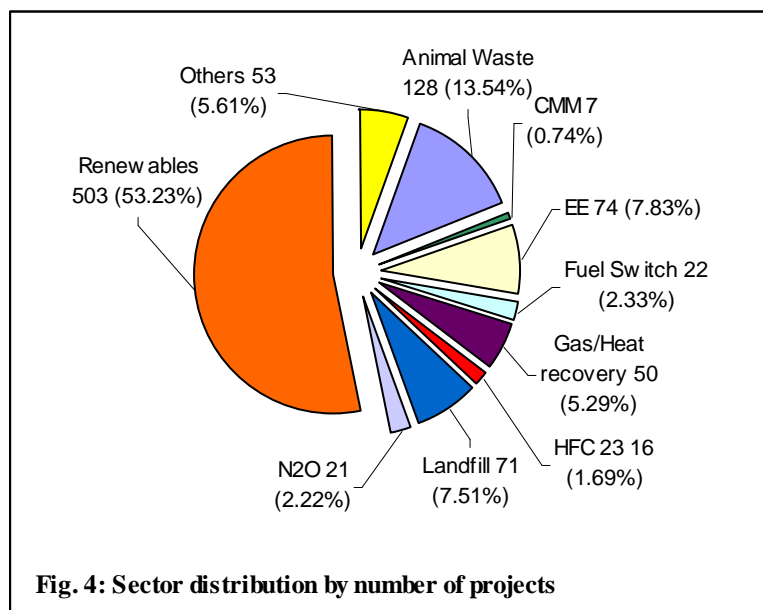
Sectoral Distribution

As shown in Fig. 4 and 5, sectoral distribution suffers the dominion of industrial gases. If the amount of emission reduction is taken into account, 2 types of projects are by far on the top spot: N₂O and HFC₂₃ project account for almost 56% of the total annual emission reduction with a very small number of projects (only 37 over 945 total registered projects, or 3.7% of the total number). Renewable energies account 503 projects, more than an half of the total, but in terms of emissions they just account for 17% of the total reduction. Biomass, hydropower and wind power projects are the most widespread, each category accounting for more than 10 million tCO₂. Landfill activities are going to generate more than 18 million emission reduction each year with 71 projects, followed by Gas/Heat recovery, 8.430.000 tCO₂ and 50 projects; Animal Waste Management, 4.858.190 tCO₂ and 128 projects; Coal Mine Methane, 4.445.189 tCO₂, 7 projects. Energy efficiency will reduce slightly less than 4 million tCO₂ with 74 projects.

It has been largely discussed the uneven share of emission reduction generated by HFC₂₃ destruction: this kind of project is the easiest activity to implement producing large amount of CERs. It is obvious that, especially when the carbon market moved its first steps, investment were directed towards large project with low risks and high returns.

Large projects in the industry sector, especially HFC₂₃ and N₂O, are very attractive since the transaction costs are low, the technological risk is low, additionality can be proved relatively

easily and the amount of obtainable CERs is very big.



Energy efficiency, largely acknowledged as cost effective and easy way to cut GHG emissions, has only a 2.04% share of the global emission reductions. This is due to the structure of the CDM itself: it has been designed for a stand alone activity, implemented at the same time, even if different locations where the project is implemented can be “bundled” together for registration purpose¹⁶. This structure is not suitable for most of the high potential Energy Efficiency actions, which most of the time can be scattered, occurring in different moment in time. The most promising sector for energy efficiency, transportation and building sector have been virtually avoided by CDM¹⁷, but especially in the developing countries these two sectors account for a very

¹⁶ Christiana Figueres, Michael Philips; 2007.

¹⁷ There are only 2 registered projects in the Transportation sector, and one in the Building. Together they account

large amount of emissions. As cities and its population grow very fast, millions square meters of new apartment, offices and commercial building are constructed every year, while thousands of new cars hit the road every month.

The new development of CDM, the CDM Program of Activities¹⁸, will make easier to pursue emission reductions in these two sectors, which have an enormous potential, creating a single package for actions that will occur in a different moment in time.

The dominion of HFC₂₃ and other industrial gases is going to last for short: since almost every HFC₂₃ and N₂O production facility has been covered with a project, it is possible to say that this activities have already peaked their emission reductions and they are going to have a lighter weight on the overall share of tCO₂ reduced. As the closest and easier opportunities have been harvested, the market is now moving towards other sectors and exploring new kind of projects. As already said, PoA could be a great incentive to undertake activities in sectors not exploited up to now. Moreover, most of the investors need to diversify their portfolio in order to reduce the related risks, creating room for project in new sectors or in sectors whose potential for GHG reduction has not been totally tapped.

LULUCF is not playing a role in the current share of projects: mainly for the difficulties of the projects and the restriction in the EU ETS for credit generated by such activities. Only one project has been registered and it is not expected to have a great change until 2012.

Carbon Capture and Storage

Carbon Capture and Storage (CCS) is seen as the most promising technology for reducing significantly CO₂ emission: it is based on the capture of the CO₂ generated by any structure, most of the cases it is referred to power plants, its transportation to the compressing facility by traditional pipeline and then to the storage site, which normally is a deep saline formation or depleted gas/oil field.

In Bali no decision has been reached, because of the several issues still to be fully addressed and the different positions of the participants: on the one hand, Developed countries plus developing countries from Middle East are strongly supporting the CCS to enter in the CDM framework; on the other hand most of the developing countries are not in favour of this option.

It is clear that CCS is a great tool to reach a near-zero CO₂ power plant, and the more the global demand for coal soars, from 2892 Mtoe in 2005 to 4994 in 2030¹⁹ with an increase of 72%, the more CCS can play an important role. According to IEA estimation, CCS could reduce global emission by 650 Mt CO₂, or 2% of the global emission in the reference scenario in 2030.

Even if the positive impact on the emissions is clear, several barriers are still on the path to include CCS in the CDM activities:

- Liabilities and regulatory framework: CCS is a relatively new technology; despite several pilot projects are already in operation, there is still lack of experience on a process that is supposed to store the CO₂ underground forever. Still it is not clear how the liabilities are shared along such a long period. Moreover, risk management procedure are absolutely

for 294.303 tCO₂.

¹⁸ For a more detailed description of CDM Program of Activity see par. 4.

¹⁹ China and India only account for 2279 Mtoe (almost 80% of the primary energy demand) in 2005 and 3018 Mtoe (60 % of the total primary energy demand).

needed

- Sustainable development: if the environmental benefits coming from CCS are quite clear, the sustainable development is not addressed anyhow by CCS. It does not bring any benefits to local communities, nor lead the development of a country toward more sustainable path. It is very likely that admitting CCS as CDM project would not bring any substantial improvement for the local communities or at a national level.
- Geographical distribution: one of the main concerns about CDM is the current uneven geographical distribution, and for sure CCS will further stress the concentration of project in countries such as India and China, which are going to build a large number of new coal-fired plants.
- Investments: the investment needed for a CCS plant is huge. IEA estimates that the lowest achievable cost for a complete coal-fuelled plant with CCS is 50\$/tonne²⁰, the capital cost for a pilot power plant with CCS is between 0.5 billion USD and 1 Billion USD. Including CCS in the CDM activities would redirect a large part of the financial flow needed to develop renewable and cleaner energies to finance CCS instead. It would attract investments that otherwise could support activities with a stronger impact on the sustainable development.
- Perverse effect: injecting large quantities of CO₂ in exhausted oil/gas fields, will lead to an increase in the extraction of oil and gas, which otherwise would be impossible or uneconomic, with consequent increase of the oil supply. The problem would lie in the economic incentive which will *de facto* be given to oil producers for drilling more oil.
- Global energy structure: the use of CCS is likely to make a substantial change in the energy production structure more difficult. If fossil fuels will achieve a near-zero emission status, there won't be any environmental pressure to reshape the way we exploit natural resources for producing energy, slowing down the shift from the actual structure to less carbon intensive one
- Energy security: CCS is not going to improve the energy security of any country. This point is not related with CDM, but in a broader view on CCS, it should also be considered. If the energy will be produced by the same fuel mix, it is likely that major producers of oil and gas will keep this dominant position in the supply, and oil prices will continue to influence so heavily the global economy.

CCS is not itself a bad technology: the most desirable solution is the quick development of this technology, since its contribution to the reduction of global emission in a short-medium run could be substantial, but not including it among the CDM activities.

The COP/CMP reached no agreement on this topic, but asked for more accurate analysis of the pending issues related with CCS and advocated a solution in the next COP/CMP in 2008.

HFC₂₃ destruction projects: existing and new facilities.

HFC₂₃ is a by product of HCFC₂₂, a gas used, among others for the production of refrigerators and air-conditioners. HCFC₂₂, as decided by the Montreal protocol, should be phased out: developed countries will reduce production and consumption of the gas, phasing it out in 2020, while for developing countries the deadline for the phasing out is delayed to 2030.

²⁰ Including capture cost, transportation and storage.

The HFC₂₃ projects have been the leading type of project in CDM. The large amount of CERs obtainable²¹, large unitary abatement cost, relatively known technology made this type of project very attractive for investors.

These projects account for 167 Mt annually, 36.58% of the total amount of CERs to be generated by all CDM registered projects, with a very small number of projects: 17 HFC₂₃ destruction projects over a total of 945.

Several critics have been moved to the HFC₂₃ projects.

Firstly, its lack of sustainable development: since the project itself consists only of the destruction of the gas, there is no substantial improvement of the general conditions of the local communities, or at a national level.

Secondly, it could create a perverse incentive to the increase of total amount of HCFC₂₂, even superior to the current demand, since the destruction of HFC₂₃ would provide financial resources to the plant owner through selling CERs. This would lead to serious implementing problem of the Montreal Protocol, which instead is pushing for accelerated phase out also in the developing countries.

Developing countries with HCFC₂₂ production plants newly built, push for the inclusion in the CDM activities also of the new facilities while, on the other hand, developed countries are opposing this solution, since it could lead to delay in achieving Montreal's objectives, and to higher amount of HCFC₂₂ produced only to destroy a larger quantity of HFC₂₃.

There is no simple solution to the problem: China is pushing for including new facilities in the CDM, and the rationale is that new plants have been already been build since the deadline for the construction of new plants is allowed by the Montreal Protocol until 2011. So HFC₂₃ will be simply vented in air, since there is no economic incentive for the plant owners to burn the gas. Even if the sustainable issue still lies on the table, the problem of reducing the emission of a powerful GHG shall be considered.

Developed countries are afraid the inclusion of new HCFC₂₂ plants will lead to missing Montreal's objectives and will lead to higher production of HFC₂₃ only for economic reason, favouring countries hosting such facilities comparing with regions already disadvantaged in the CDM project share.

An important consideration is about the HCFC₂₂ demand: since it has still a demand on the market, there will be producers trying to satisfy it. This will lead to the establishment of new facilities in developing countries until the deadline set by Montreal Protocol. New plants have been already built, so the main objective is to address the emission of these new facilities

Possible solutions lie on the table:

- Crediting the new facilities, but with a discount rate limiting the CERs obtained by such facilities to the amount needed for covering the expenses for destructing the HFC₂₃ produced, allowing only a small additional gain.
- Not including the new plants in the CDM scheme, but this solution would just let a large amount of the powerful GHG to be vented in the atmosphere. This option could produce positive results for the environment only if other sources of funding than CERs are provided

²¹ HFC₂₃ is an extremely powerful GHG gas: its global warming potential is 11.700, and it lasts in the atmosphere for 3200 years.

to the plant owner in order to destroy the HFC₂₃ (i.e ODA, Global Environmental Facility).

- Allow the new facilities to gain credits, even if it could lead to a higher production of HCFC₂₂ due to the financial incentive created by the CERs.
- Extending the crediting period by 2 years, for facilities built until 2006 instead than 2004; covering the facilities already built that would otherwise vent the HFC₂₃ in the atmosphere. This solution has been rejected by most of the parties since it does not solve the problem of the new plants once and for all.

Due to the strong division among countries, no decision has been achieved, so the process of evaluation will continue until next COP/MOP. More information is needed to find the most suitable solution: it is necessary to know the actual and future demand for HCFC₂₂ and the actual number of new facilities already operating.

Review of the CDM

During the COP/Mop, some critics have been moved to the CDM as successful instrument. There is a broad consensus on the benefits the Mechanism has brought in the fight to the Climate Change. Attracting capitals, providing cost-effective reductions, help developed country to reach a more sustainable path to economical growth; all of them are widely recognized. But beside the positive results, some imperfection and weak spot has been pointed out.

Switzerland, on behalf of the Environmental Integrity Group²², proposed to review the CDM as a whole, entrusting a third part, namely a big private consulting firm with a solid background, to carry out the assessment.

The proposal is strongly supported by International Emission Trade Association (IETA), and it is intended to find out the weakness of the system and address them with the needed actions and change.

One of the most discussed items is the role and participation of DOE in the CDM. Many pointed out the lack of an evaluation system based on the DOE's performance. So far, once the DOE is accredited by EB, it only goes through some spot check by the EB: if there is some non conformity, the DOE could lose the accreditation. But it is more a theoretical procedure, since no DOE has got its accreditation revoked. The proposal is to create a system of evaluation of the DOE performance, i.e. on the basis of the number of rejected project, to control in a stricter way the conducts of the DOE

The Executive Board has been also criticized. It is worth to note that finally the structure is self financed, and the staff of the EB had grow very fast in the past years, improving the evaluation of the project proposal, both in terms of time and quality of the revision by the EB. A more accurate revision of the project has been possible thanks to the enlargement of the EB staff, and it lead to a rise of requests for review in the last months.

On the bad side, EB still has to improve some process.

Most of the project owner and DOE also suggest a more effective communication among them and the EB: most of the requests for review are often simple changes or lack of clarity in some parts of the PDD that not invalidate the whole project. A more effective communication would solve these problems avoiding the long procedure of the review for little and marginal changes in

²² The Environmental Integrity Group is composed of Mexico, the Republic of Korea and Switzerland.

the PDD. Also an improved communication and exchange of information would simplify the process to submit a new methodology.

There is lack of consistency in some methodologies and also in some decision of the EB. Especially for the latter, it is hard to track every decision of the EB and design the project accordingly to the large amount of decisions taken by the EB. As a solution, the EB catalogue of decision has been issued on the UNFCCC web site, providing a tool for checking the latest and past decisions.

Mainly the problems with the CDM process, including EB and its bodies' decisions, are related to the lack of certainty. In some cases EB decisions are taken in closed session and without providing reasons and justifications for the decisions taken. If CDM has to catalyze the private sector's investments, a clearer process is needed at all level. Moreover, decision making is not always transparent and in some cases the decision provided by the EB are not justified.

4. Future trends and scenarios

The post-2012 regime

The Kyoto Protocol will expire in 2012: what will happen after this date? Will it be the end of the international effort to fight climate Change, or it will continue with a different shape?

These are the most recurring question after Bali. The COP/MOP did not provide any answer, it just paved the way for the negotiation, but what will be the content of the new agreement in 2009, if there will be any, is not clear.

There are several different positions among the countries: each of them is looking for a way to effectively tackle GHG emissions but protecting internal economic growth.

The European Union has clearly defined its policy: 30% cut to the total emission if there is a global agreement including the major emitters, or 20% cut if there is no agreement. The EU is taking the lead in fighting global warming, and it is setting ambitious goals for renewable energies development: 20% of the total final consumption by 2020 shall be produced by renewable source, including 10% use of bio diesel in the transportation sector.

Developing countries are not keen to take any limitation in the future, pleading the low per capita emissions, the need for economic growth to raise per capita GDP and increase rural income, and blaming the developed countries for being historically the responsible for GHG emissions. Notwithstanding they will be the greater emitters in the next years²³, since their rates of growth in GHG emission are faster than western's. The last document produced in Bali sets some cheering prospective including developing countries in the future discussion on setting limitations to GHG emissions, even if considering different socio-economic conditions and different responsibilities.

United States are probably going to join the future agreement, especially under the pressure of a change in the government in the next elections, also because every developed countries already signed the Kyoto Protocol and are going to participate in a future agreement. In any case, it seems very likely that new regulations will introduce Emission Trading and the carbon market in the USA, if not a national level, at least it will happen at state level. 7 states are already participating in the Regional Greenhouses Gases Initiative, and more are joining the scheme, also at city level the tendency is to take action against Climate Change. The inclusion of USA in the future

²³ China overcame USA as first world's CO₂ emitters in 2007.

agreement is necessary to give consistency to the new policies and to give a strong signal to the world after few years of substantial lack of environmental policies or proposals by USA at international level.

Whoever is going to participate in the future regime, and of course there should be a compact response from every country to keep the hope some result can still be achieved, it is not yet clear how this regime will look like. But uncertainty is only going to create delays in the investments and in the funding of GHG emission project. According to the new regime, substantial change could be introduced in the Flexible Mechanism. It is not sure that the Flexible Mechanism will continue to exist in the future agreement, but is very likely that any new architecture will include similar tools.

As already said, the Mechanisms achieved a great success in catalyzing private sectors' funding, which are largely accredited as the only real available option to fight Climate Change. Without private involvement, Governments are not able to tackle in an effective way this challenge.

Time is crucial: it is necessary to reach an agreement at latest in 2009, but the business community needs strong and credible signals even before 2009. Investments are decided now; companies are not waiting 2012 to shape their industrial policy. Most of the energy-related investments have a very long life, even over 50 years, CDM as well have a quite long term, up to 21 years. Delays in creating the necessary regulatory and policy framework will have the only consequence of pushing the needed investments in the energy sector toward "traditional" energy solutions. Companies can not plan with precision their investments if there is no general framework: if the 22 trillion USD identified by IEA will fund carbon intensive production models, it will be impossible to reach the target proposed by IPCC. What will be decided in these years will shape the GHG emission for the next decades: there is no more room for talking without effective actions.

The uncertainty is already affecting CDM: despite the large confidence the tool will survive the transition to a new regime, maybe through some change, time is running out. An investor can only on CERs generated until 2012, leaving only few years to gain the revenues from the CDM process.

Few elements should be introduced in the new agreement. First of all, it will not be possible to tackle GHG emissions only with market-based tools, since consistent policies are needed, even if the private involvement through the market is necessary but not sufficient. The first step should be the improvement of the structure created by the Kyoto Protocol, exploiting the positive results it reached.

There will be the need of certain and realistic goals: if goals are too ambitious there would not be credibility and consequently lack of private willingness to invest. It is also arguable that non-binding limitations don't create the necessary support and environment for private investments since they don't create any market certainty.

Program of Activities

The CDM has been established as a single project, occurring at one specific moment in time, reducing GHG emissions by an amount known *ex-ante* before the project is actually implemented,

in a specific area.

The underlying logic was to ensure that each project could deliver in a traceable and measurable way the GHG reduction and contribution to the sustainable development with a rigorous check of each single activity by the CDM EB. This approach leads to longer procedures and higher transaction costs but keeps a stricter control on each activity before registration and delivery of CERs.

This approach was necessary especially in the early stage of CDM to make way for project proposals: after few years, even through several positive results, is showing some weakness.

As said regarding the Sectoral Distribution, if projects can generate CERs only if they obey these rules several sectors with great potential for emission reductions are left behind. Currently it is clear how crucial areas for tackling Global Warming, as Building, Transportation and many Energy Efficiency actions on the demand side are almost excluded from CDM. This is due to the nature of the emissions in these sectors: there are many emitters, each emitters account only for a small fraction of the total, they are spread in a vast area, most of the time there is poor economic incentive to switch for cleaner solutions.

Since the COP/MOP 11, in Montreal, 2005, CDM Program of Activities (PoA) have been designed as a tool to address the lack of projects in those sectors accounting for a large part of the total emissions and growing with fast rates. Due to several barriers, PoA are still to be actually implemented: no PoA have been registered yet.

PoA have the ambitious aim of correcting the dominion of big projects in the industrial gases sector and renewable energies, redirecting investments toward those projects with high sustainable development impacts and covering area that otherwise would not attract private investments because of the high transaction cost and the small amount of CERs.

A Program of Activities is “A *programme of activities (PoA) is a voluntary coordinated action by a private or public entity which coordinates and implements any policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), which leads to anthropogenic GHG emission reductions or net anthropogenic GHG removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM Programme of Activities*”²⁴.

A PoA could be divided in two different levels. The first level is the program, which provides the framework (financial, organizational and methodological²⁵) to implement the activities for achieving the emission reduction. The program itself does not achieve any reduction; it is only the organizational and financial.

The emissions reductions are achieved by the CDM Project Activity (CPA), which are the actual actions that lead to the GHG reduction. All the CPA must be identical even if can be implemented by many entities. It is important to note that CERs generation occurs at PoA level, not at CPA level.

This structure is substantially different from a “traditional” CDM project because of the following elements:

²⁴ Guidance on the registration of project activities under a programme of activities as a single CDM project activity, CDM EB meeting 32, July 2007.

²⁵ Christiana Figueres, Michael Philips; 2007.

- **Managing entity:** it is the project participant which submits the PoA, is in contact with the CDM EB for all the matters, including the distribution of the CERs. The managing entity does not implement any actual actions, but must provide the necessary support for other to carry out the activities
- **Host country:** the physical boundary of a PoA can be extended to many host countries, but in this case it must obtain the Letter of Approval by each of the host countries.
- **Duration:** the maximum duration for a PoA is 28 years for non-forestry activities, 60 for forestry. Every 7 years the methodology is checked.
- **Emission reduction:** the emission reductions actions are not occurring necessarily in the same moment in time.
- **Registration of new CPA:** new CPA can be added at any time during the implementation of the PoA time. They are added automatically with no additional checks.
- **Methodology:** a PoA can use only one methodology, baseline and monitoring methodology. It can cover one single measure or a set of measures but they must be implemented all in the same facility/installation
- **Additionality:** it must be proved both a PoA level and at single CPA level. A PoA is additional when: the measures proposed would not be implemented

It is possible to identify 4 different type of CPA:

1. **Single measure in a single location:** the measure, i.e. one measure to improve Energy Efficiency in a building, is applied to a single location (each building) which is the CPA
2. **Several measure in a single location:** in this case, i.e. a measures to improve the efficiency in a specific equipment of a power plant, the CPA is each improved equipment within the same facility
3. **Several measures in many locations:** this case refers to a package of measures to be applied in different locations, i.e. different energy efficiency actions in households. The CPA could be an area, a city o part of it, where the package of measures is applied in many homes
4. **Single measures in many locations:** the CPA could be each area containing many locations, i.e. replacement of low-efficient appliance in homes

Also the documentation needed to submit a PoA is different from common CDM activities with three relevant documents.

The first one is the PoA PDD, where the Managing Entity is identified and there are the eligibility criteria for CPA. The document must contain also the additionality both for PoA and CPA.

Then there is the CPA DD, which consists of the general description of the CPAs and how they are eligible according to the PoA DD.

The third document is the CPA DD for the first CPA. Basically it is the application to a real and completed CPA, containing the information relative to the CPA to be implemented.

Barriers for PoA implementation

As said, PoA have a great potential, since they can cover those sectors experiencing fast growth associated with high emissions, according to some estimates the potential for PoA is around 1.6Gt

Co₂e/year by 2020²⁶, but on the other hand the actual submission of a project has some complications that make the process hard.

Firstly, PoA are somehow new: there is no practical experience on this kind of projects and it will be a learn-by-doing process.

In several cases, the PoA will need a new methodology covering several actions in the same sector, leading to longer time for submitting a project.

DOEs will play a big role in PoA. They are liable of the inclusion of new CPA: the process is automatic and no new verification and registration are required, so new CPAs are directly uploaded in the UNFCCC website. It makes easier and fast the inclusion of new CPA, but if there is a incorrect inclusion, the DOE is responsible of depositing the equivalent amount of CERs obtained through the mistaken CPA and no new CPA will be included before all the existing CPA are reviewed.

Beside liability, DOEs have also the burden of the monitoring: PoA can be made of numerous CPA. Changing light bulbs for more efficient fluorescent bulbs could reach easily thousands of hundreds of single CPA. Monitoring is crucial and it could lead to high transaction costs: sampling is allowed in order to reduce the cost, but still it is unclear if it will be really possible to access the single sites and the amount of data needed. Moreover the monitoring over a long period and for a large number of sites increases the complication for the DOEs.

Performance risk is quite high, since many project participants are involved and much will depend on the Managing Entity to reach the actual potential of emission reduction of a PoA.

On the methodology side, if the applied methodology is revised, there will be the need to revise every CPA; the methodology is checked every 7 years. In several of the most promising sectors there are only few approved methodologies (i.e. transportation) limiting the number of potential project to be submitted to EB. Proposing a new methodology increases the risk of the project itself, since the new methodology has to be checked by the CDM Methodology Panel and it leads to longer time for project approval, since the process could last for a very long time.

Land use, land use change and forestry (LULUCF)

The issues related LULUCF are still debated. The only activities that can be registered as CDM are reforestation and afforestation. Mainly the reasons to the exclusion of LULUCF are related with the methodological complexity, problems with monitoring and verification, and high risk for leakage, since protecting a forest somewhere could just bring to more pressure somewhere else, without net benefits.

Despite the difficulties LULUCF is a key sector for the fight to Climate Change.

In particular deforestation is the major source of emissions in developing countries and accounts for 20% of the total global GHG emission. The focus has been moved to Reduced Emission from Deforestation and Forest Degradation (REDD), with debating on the inclusion of it in the CDM framework. REDD is a promising tool for cheap and feasible emission reduction, with an important contribution to sustainable development. It could lead to protection of the natural habitat

²⁶ Five sectors have been identified as more sensible to PoA development: Thermal energy and Renewables, Transport, supply side Energy Efficiency, Demand side Energy Efficiency, Switching fossil fuel. Source: Carbon credit supply potential beyond 2012, Energy Research Center of Netherlands.

for rural community depending on the forests, biodiversities and soil conservation. Moreover, the financial flow from REDD could easily reach several million USD, providing funds for LDC to implement alternative and sustainable pathways for development.

So far, only Afforestation and Reforestation are allowed under the CDM; in the post 2012 it is likely that also other LULUCF activities will be included, due to the magnitude and the low cost of the emission reductions achievable.

In Bali the parties agreed in changing the limit to Small Scale activities, allowing projects that have a net reduction of no more than 16 K ton/year.

5. The success of CDM in China

General Framework in China

In order to be an eligible country for CDM project, every country must accomplish with some institutional prerequisite. First, the country must have ratified²⁷ the Kyoto Protocol. Moreover, the country had to formulate the Interim Measures for the Management of CDM Project Development and to nominate its national structures (DNA and EB) as required by the CDM Executive Board. Every country can choose the appropriate DNA, and has the freedom to choose the regulatory system to define the process that a CDM project must follow to obtain the approval.

The Interim Measures are the guidelines and rules that each country has to formulate in order to clarify the process generating CERs. The Interim Measures can be different among countries, depending on the specific characters of each nation.

China is a Party of the UNFCCC from 1992, even if direct policies for controlling the climate change have been implemented. It has approved the Kyoto Protocol in August 2002, making the country eligible for CDM participation in competition with other developing countries²⁸. In order to participate in the CDM cooperation, Chinese government has appointed the National Development and Reform Commission as the DNA for CDM, and launched official CDM policy titled “Interim Measures for Operation and Management of Clean Development Mechanism Project in China” in the year 2004. Therefore, both international and domestic rules and procedures need to be followed in developing and implementing CDM projects in China.

According to the Interim Measures for Operation and Management of Clean Development Mechanism Project in China, the project owners, also together with their foreign partners, can submit CDM project proposals.

There are some general requirements for classifying a project as CDM. They must:

- Be consistent with China’s laws and regulations, sustainable development strategies and policies, and the overall requirements for national economic and social development planning
- Conform to the requirements of the Climate Change Convention, the Kyoto Protocol and relevant decisions by the Conference of the Parties
- Not introduce any new obligation for China other than those under the Convention and the Protocol

²⁷ This kind of commitment doesn’t imply any limit to emission.

²⁸ The most active countries on this field are India, Brazil, Chile, and some Central American nations.

- Promote the transfer of environmentally sound technology to China

Furthermore, funds for CDM projects from the developed countries shall be additional to their current official development assistance and their financial obligations under the Convention

The sectors identified by the Chinese government as key areas are energy efficiency, renewable energy development²⁹ and methane recovery.

The Interim Measures establish that the owners of the revenue due to transfer of emission reduction of GHG are the State and company implementing the project, with a ratio that is defined by the Chinese Government³⁰. In the case of HFC23 and N₂O project, the revenues from selling the CERs will be administrated by the Sustainable Administration Facility who will allocate them for developing projects for the sustainable development.

Chinese Institutional bodies and procedure for CDM

The National Committee on Climate Change (NCCC) is in charge of review national CDM policies, rules and standard and to nominate the members of the National CDM Project Board (the Board). The Board has an important role in the CDM process: checks the participation requirements, the PDD, CERs price, issues related to funds and technology transfer as well as the sustainable development effects of the projects. Moreover the Board has to report to NCCC on the implementation of CDM projects and make recommendations on the review of national rules.

The Chinese DNA refers to the National Development Research Commission (NDRC). This institutional body (as DNA) is in charge to accept the application for CDM projects and will issue the approval letter on behalf of the Government, based on the decision made by the National CDM Board.

Seven representatives from four Ministries and three agencies compose the EB. The ministries involved are: Ministry of Science and Technology (MOST) serving as co-chairs of the EB, Ministry of Foreign Affairs (MFA) who serves as the vice chair, Ministry of Finance, and Ministry of Agriculture. The agencies composing the Board are: National Development and Reform Commission (NDRC), as co-chair jointly with MOST, State Environmental Protection Administration and China Meteorological Administration.

This mix of EB members serves to provide the needed cross-sectorial prospective for managing CDM projects. It is clear that a correct vision of a CDM project must be formulated by joining different points of view and considering the large number of interrelated factors engaged. A various set of issues are involved in a CDM project: social participation and acceptance, environmental priority, technological development and transfers, economical and financial opportunities, international policies and relationships, internal policies and needs. It is a natural consequence that all the Ministries and agencies mentioned above take part in the body controlling the CDM development process.

²⁹ The reason lie in the scarcity of supply and the growing demand of electric energy in a country lacking in fossil fuel stock.

³⁰Article 24 of the Interim Measures for Operation and Management of Clean Development Mechanism Projects.

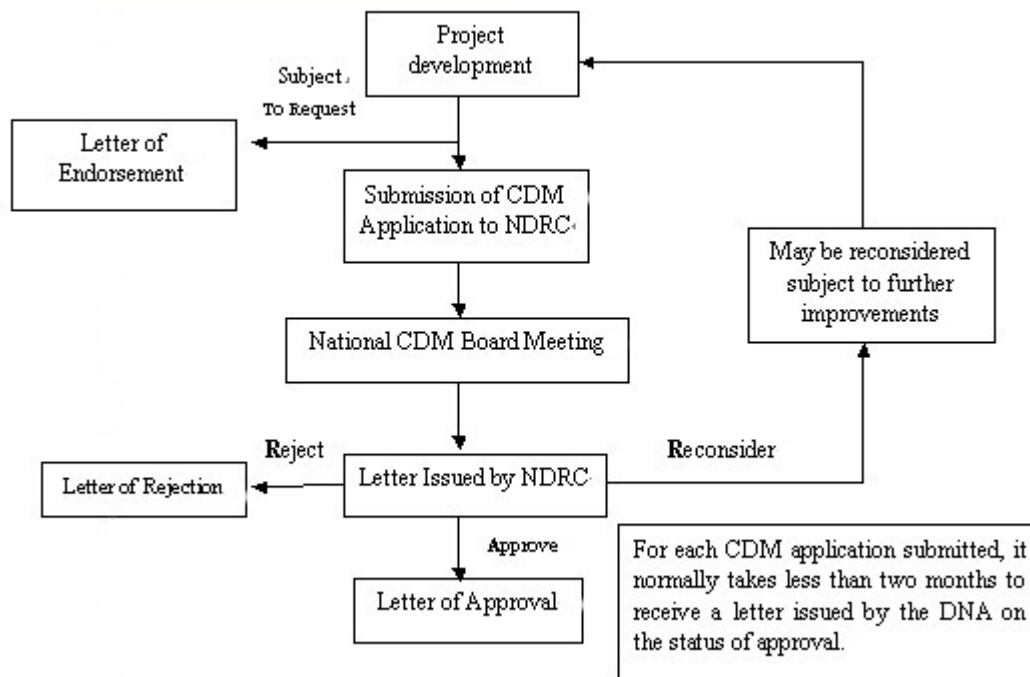


Figure 6: Project approval procedures. Source: <http://cdm.ccchina.gov.cn>

The following five steps for obtaining CDM project approval are scheduled:

- Step 1: The project owner or developer prepares the necessary documents, including the PDD
- Step 2: Project owner submits required documents to NDRC
- Step 3: independent experts invited by NDRC review the Documents and provide their comments to NDRC
- Step 4: The National CDM Board will review the application documents and makes its decision accordingly
- Step 5: NDRC will approve or reject the application in accordance with the decision made by the National CDM Board, and issue the approval letter on behalf of the Chinese Government to the applicant.

China distinguish itself for a special rule imposing that the project owner must be, in any case, a Chinese company or a Joint Venture owned for the minimum of the 51% by a Chinese company.

Why does China lead the CDM market?

China is largely the first country for CERs generation: every year the 161 registered CDM activities produce 92.902.049 tCO₂. The gap with the second country, India, in this list is huge: India will supply 29.026.737 tCO₂, meaning less than one third of the Chinese generation even if 306 projects have been registered in India. The global CERs annual generation (excluding China) is 99.034.142 tCO₂ which outnumbers China only by 7 millions tCO₂. The country is hosting the largest number of Wind projects and of Hydro as well, and also the only registered Reforestation project.

Tab. 2: Registered project in China

Sector	Sum of reductions	Number of projects	%of global projects	% of global emission
Animal Waste	152,341	2	0.21%	0.08%
Biomass	1,276,042	9	0.95%	0.66%
Hydro	4,997,754	51	5.40%	2.59%
Landfill	2,331,160	8	0.85%	1.21%
N2O	14,413,571	3	0.32%	7.47%
Wind	6,171,386	57	6.03%	3.20%
Reforestation	25,795	1	0.11%	0.01%
HFC 23	54,312,087	9	0.95%	28.13%
CMM	4,455,189	7	0.74%	2.31%
Gas/Heat recovery	4,142,936	13	1.38%	2.15%
Total	92,902,049	161	17.04%	48.12%

What's the reason behind this impressive result?

Firstly, it is sure that China is representing the global engine for economy. Since the country is hosting the production of large part of global goods³¹, the GDP is soaring almost every year with a double digit, per capita income is increasing; it is easy to expect that also most of the foreign investments in the CDM sector are attracted in China.

China has abundance for renewable energies potential, almost half of the world's HCFC₂₂ production occurs in the country; it is experiencing fast increase in energy demand largely satisfied with coal; there is big potential for energy efficiency since most of the plants and facilities are old or suffered poor management and maintenance. These reasons make China one of the best host countries in terms of potential projects.

But it is not enough to explain the big gap between China and the other fast developing countries, such as India and Brazil.

The reason for the Chinese success lies in the institutional and regulatory framework set up by the Chinese government. China created the DNA and issued the procedure rules in 2004, and this framework has been stable and clear for all the investor: China has a clear legislation over CERs ownership as well as for taxation on the different kind of projects.

China has made a great use of capacity building with the help of foreign countries raising awareness at national and regional level: every province hosts a CDM center and the government officers are familiar with CDM and its procedures, a large number of consulting companies provide support and services to project owners and investors who want to participate in the CDM cycle. These conditions are leading to low transaction costs and to reducing part of the project risk.

Coupling the macroeconomic and demographic characteristic of the country with the stability of the regulation, China has become one of the best host countries and the largest generator of CERs.

The China CDM Carbon Fund

In mid 2007 the Chinese Government established a CDM Fund collecting the revenues from CDM projects implemented in China. According to Chinese legislation, as said in Par. 5, emission

³¹ IEA estimates that in 2006 around 34% or 1.6 Gt of CO₂, of the total Chinese emissions are due to the production of exported goods.

reduction resources are owned by the State government, while gains from selling CERs is owned jointly by Government and the Project Owner. The share allocated to the Government is 65% for HFC₂₃ projects, 30% for N₂O, and 2% for the rest of the project type.

The stated objective of the Fund is to support and promote national activities for addressing Climate Change. It will provide support for activities addressing Climate Change in the shape of grants, loans and other financial instruments.

The resources collected by the CDM Fund will be used for supporting:

- Capacity building and public awareness activities for addressing Climate Change
- Mitigation activities, including activities on CDM projects
- Adaptation activities
- Activities for achieving the general objective of the fund and increasing its financial resources
- Other actions in areas identified by the State Council

The CDM Fund will support project proposals collected through NDRC and evaluated by the CDM Fund Board, composed by Ministry Of Science and Technology, Ministry of Foreign Affair, Ministry of Finance, Ministry of Agriculture, State Environmental Protection Agency, China Meteorological Administration, National Development and Reform Commission. The CDM Fund Board is the legal management institution.

In addition to the CDM related revenues, the CDM Fund can rise other funding from: donations by domestic and international institution; funding and grand by financial institution such as World Bank, Asian Development Bank; revenues from the CDM Fund activities, other resources approved by the State Council.

6. What happens in Italy?

National Allocation Plan and the role of CDM

The objective for Italy under the Kyoto Protocol is to reduce GHG emissions by 6.5% comparing to 1990 levels. According to the National GHG emission inventory, total emission rose to 519.5 MtCO₂eq in 2004, meaning an increase of 11.8% and a difference of 95 MtCO₂eq with the Kyoto goal (485,7 MtCO₂eq).

The Italian NAP for the second Phase, receiving the Commission's decisions, sets the new CAP at 201.52 MtCO₂eq annually, and lowers the limit to the use of CDM at 15% from the previous 25%. Table 3 shows the new NAP submitted to EU Commission in December 2007.

Tab.3: Allocation for the period 2008-2012. Source National Allocation Plan

	2008	2009	2010	2011	2012
Existing Plants (Mt)	199.1	191.04	183.88	179.35	176.24
New comers (Mt)	15.65	15.65	15.65	15.65	15.65
Total	214.75	206.69	199.53	195	191.89

Italy is quit active on the carbon market: World Bank registered an increase on the Project based market by Italy, from 1.5% of the total market in 2005 to 10% in 2007, ranking second following

United Kingdom, which is accounting for 50% of the market³². Most of the purchases are performed by private companies and on bilateral basis. Compliance buyers largely dominate the scene, with the big electricity companies taking the lion's share.

Moreover Italian government financed 3 different World Bank carbon funds: Italian Carbon Fund, Community Development Fund and Biocarbon Fund totaling around 105 million USD.

On April 2007, the Voluntary Market for CO₂ Emission Units has been established, and 35 companies are participating; among them there are large utilities, public companies and mixed private-public entities.

As for the EU directive to raise the share of renewables to 20% of the total energy demand by 2020, Italy has needs serious efforts and effective policies. According to Mr.Gatta³³, chairman of the Italian Association of Electricity Enterprises (Assoelettrica), the European target is unfeasible. The request of the Commission is around 26 Mtoe, 5 Mtoe over the total theoretical potential for renewable energies in Italy.

Beside the physical limits to the expansion of renewables in Italy, one more remark can be done. Italian companies suffer from long and complex bureaucracy for opening new facilities: due also to the procedure for revising new projects by the local Regional bodies, time for receiving the approval can be extremely long and procedures complicated.

Looking at the incentives for the production of energy from renewable sources, Italy set up two instruments that are providing some interesting results: Green Certificates (energy producers must produce or import at least 2% of the total by renewable energies, if the target is not met the companies can buy the green certificate, certifying a certain amount of energy has been produced by clean sources) and White Certificates (certificates attesting the energy saved by distribution companies or Energy Service Companies, obtained through specific energy saving projects). But still market share for clean energies is relatively small: in 2005 the total share for renewable sources was 5.2%, and in power generation it is dominated by Hydropower and Geothermal, leaving little room for "new" sources such as wind and solar, the ones with biggest potential for development.

The European Fund for Regional Development, allocated 1.85 billion € for the development of renewable energies in the period 2007-2013, energy efficiency and efficient transportation systems in Italy, of which 1.45 billion € will be allocated in 5 regions³⁴. This amount of funds, the highest allocated, could boost local development and increase the weight of new energies in Italy.

On the financial side, the adjustment needed to reach the EU targets for Renewables and to reach Kyoto targets require massive investments. Only the investments needed to reach the Renewable target are estimated to be between 75 and 85 billion € by 2020. The task is hard, but it could provide new business opportunities and boost the economic development in several regions of the Country.

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³² Data refers to volumes transacted. Source World Bank: "State and trends of the Carbon Market 2007".

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