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Contribution of CDM Projects to Sustainable Development: Dutch case study

In 2006, the Policy and Operations Evaluation Department (IOB) of the Netherlands Ministry of Foreign Affairs launched a study to evaluate the contribution of AIJ and CDM projects in the portfolio of the Netherlands Government to sustainable development in the host countries. The starting point for the study was that sustainable development is a country-context specific concept, which has for the CDM been underscored by the Marrakech Accords.[1]

The study has been carried out by Foundation Joint Implementation Network and the Institute for Environmental Studies, both in the Netherlands (see also *JIQ*, July 2006, p.7). Its aim was to explore how GHG emission reduction projects with Dutch investment involvement and Government approval have thus far contributed to sustainable development in the host countries and what contributions can be expected from these projects in the future. For the first part of this aim, five Dutch AIJ projects have been studied on the basis of project documents (plans and realised outcomes) and field trips (including interviews with stakeholders). This part will be discussed in the next issue of *JIQ*. For the second part of the study, 44 CDM projects have been studied on how these are expected to contribute to sustainable development. The latter part is the topic of this article.

For the CDM part of the study, the following three questions have been addressed:

1. What contribution to sustainable development can be expected from CDM projects in the Dutch portfolio according to the project identification notes (PINs), project concept notes (PCNs), and project design documents (PDDs)?
2. What contribution to sustainable development can be expected from CDM projects according to the CDM Designated National Authorities (DNAs) in the host countries?
3. What could, given the answers to the above two questions, be the total expected contribution to sustainable development in the host countries provided that all CDM projects will be fully realised?

Box 1. The Dutch CDM activities

The Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM) is responsible for the overall climate change policy of the Netherlands and is designated as the responsible CDM authority. The Netherlands Government has allocated more than € 402 million (to VROM) for the purchase of CERs (non-ODA). At the same time, the Netherlands Government has been involved in programmes to build capacity for CDM project cooperation in developing countries. Via these programmes, potential CDM host countries are assisted in establishing a DNA for the CDM and are trained on the modalities and procedures of the CDM as formulated in the *Marrakech Accords*. The Ministry of Foreign Affairs (Development Cooperation), within the Netherlands Government, is responsible for these capacity building programmes. The Ministry of Agriculture is responsible for Land use, land use change and forestry (LULUCF) under the CDM (particularly in relation to approval of CDM projects), while the Ministry of Economic Affairs and VROM have a shared responsibility for emissions trading policy.

[1] This article has been written by the researchers and does not necessarily reflect the views of IOB.

The sample of study projects was compiled in order to reflect the geographical and technological spread within the Dutch CDM portfolio (see also Box 1), as well as the different stages that projects are in (*e.g.* validation, registration). Eventually, 44 projects were selected for analysis in 18 countries. Approximately one third of selected projects can be classified as small-scale.

As the CDM projects analysed in this study have been either operational for a few years only, or will become operational in the near future, most of their contributions to sustainable development are *expected*. Nonetheless, CDM projects contain an implicit incentive to monitor project performance in order to be able to generate CERs, which is crucial for the success of a project. This CER incentive to carry out CDM projects according to plan also increases the likelihood that planned contributions to sustainable development will be delivered.

Indirect benefits

However, it would be incorrect to conclude that all expected contributions to sustainable development would be ‘automatically’ delivered when a project reduces GHG emissions according to plan. For instance, it is reasonable to assume that local air improvement will take place if a project, in order to reduce GHG emissions, switches from fossil fuels to a renewable energy source. Similarly, in such a project technology transfer takes place, which is also considered by most project documents a contribution to the sustainable development of the host country.

Other aspects of sustainable development, however, are less tightly connected to the success of the GHG emission reductions. For instance, the reduction of drudgery for women and children in the biogas projects studied (*i.e.* reduced need for collecting firewood for cooking and heating as in the business-as-usual case) will only take place if their firewood collection activities are not replaced by equally burdensome labour or if the firewood collection continues for another purpose.

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In addition, several projects promise local community development plans, but the success of these plans is hardly connected to the GHG emission reduction component, although in some cases, such plans are directly financed from CER revenues, thus providing a direct link with reducing GHG emissions. Moreover, for some projects it is claimed that the project activity will lead to lower electricity prices due to lower dependency on imported fuels.

Table 1 shows which sustainable development aspects identified in the study projects are *directly* or *indirectly* related to the successful abatement of GHG emissions. Aspects directly related to GHG emission reduction will be achieved when the CERs are successfully generated. Aspects that are indirectly related to the GHG component cannot be assumed to be realised *a priori*, even if the GHG component of a project will be successful.

Job creation

Within the portfolio of CDM projects studied, the extent to which aspects of sustainable development have a direct or indirect link with successful CER generation has been analysed by counting occurrence of such aspects per project. It was found that most project plans studied contain aspects directly related to successful CER generation. Of the aspects with an indirect relation to CER generation, job creation and local community improvement are most often quoted (in 31 and 18 of the project cases respectively), followed by improved waste management, forest conservation, education, reduced soil and water contamination, improved sanitary conditions and job quality improvement. Whether those aspects will actually materialise can only be observed in the course of project implementation.

Monitoring

In order to assess whether these ‘indirect aspects’ will also be realised upon implementation of the projects, it has been checked whether the projects contain monitoring procedures for these aspects of sustainable development. A project with a positive score on ‘indirect SD aspects’ but without a monitoring procedure for these aspects is therefore less likely to deliver this contribution than a project with positive scores and a monitoring plan in place. Based on the projects’ PDDs it appears that in 29 cases, monitoring of so-called indirect SD aspects is foreseen, either in full or in part.

In a forthcoming issue of *JIQ*, the study’s conclusions and recommendations will be discussed futher.

Table 1. Relation SD aspects and successful GHG abatement

	Link with GHG emission reduction	
	Direct	Indirect
Economic sustainable development aspects		
- Energy for cooking/lighting	x	
- Useful by-products		x
- Energy supply diversification/security	x[1]	
- Reduced dependency on fossil fuels	x	
- Job creation		x
- Improved competitiveness of industry		x
- Technology transfer (incl. FDI)	x	
- Tourism		x
- Energy efficiency increase	x	
Environmental sustainable development aspects		
- GHG reduction	x	
- Forest conservation/reforestation		x[2,3]
- Reduced soil and water contamination	x[4]	x[4]
- Improved waste management	x[5]	x
- Improved biodiversity		x
- Improved river basin		x
- Cleaner local air/ reduced non-GHG	x	
Social sustainable development aspects		
- Poverty alleviation		x
- Improved (indoor) health conditions	x[6]	x
- Job quality improvement	x[7]	x
- Improved sanitary conditions		x
- Reduced drudgery for women/children		x
- Peace pact		x
- Education	x[8]	x[9]
- Infrastructure	x	
- Local community improvement		x

[1] In case of fuel-switch projects from fossil fuels to renewable energy.
[2] The biogas projects in question will replace firewood, but CO_2 sequestration through forest conservation is not credited as CERs. Despite reduced demand, it is unclear whether firewood will be used for alternative purposes in the course of the projects.
[3] Some LFG projects carry out forestry projects, which is not related to the success of the landfill gas capture.
[4] Some landfill gas projects are constructed with a technology that both capture landfill gases and reduces soil and water contamination (direct link), whereas in other cases the reduction in soil and water contamination relies on the project management (intermediate link).
[5] For the LFG projects improved waste management is an integral part of the investment and project performance; for the industrial sector project, waste is a key input in the production process.
[6] For some biogas projects, the use of biogas is crucial for the CERs so that in-house health conditions will improve.
[7] A direct link exists in the case of coalmine methane where the work will become safer.
[8] When it involves required training of employees to work with project technology.
[9] When it involves additional campaigns for local communities and schools.

Why EU Allowances Prices May Remain Low

by Sam Fankhauser*

In the April issue of JIQ, Catrinus Jepma observed that the price collapse during the first phase of the EU ETS was predictable, and that in phase II "a similar pattern of slightly rising but eventually almost collapsing credit prices" could be observed. Although not predicting a collapse, Jepma's view is broadly supported by two independent research organisations, IDEAcarbon and ECON in their 2007 Global Carbon Report.

The *Global Carbon Report* looks at the reason why phase I prices collapsed. The main factor was of course the over-allocation of allowances, but this is only half of the story. The market was also 'long' because the external environment had changed. Wetter-than-expected weather in the Nordic countries boosted hydropower production, while a slight dip in steel production depressed emissions in that sector. Crucially, the market was also long because – at least initially – people behaved as if carbon prices would remain high. There was some abatement.

Could this pattern be repeated in phase II? The *Global Carbon Report* expects a phase II price of around € 15–20 per allowance, which is lower than the current forward price of about € 20–22.

The main reason why phase II prices could fall so low is that the expected phase II shortfall is lower than permissible imports from the Kyoto mechanisms. The entire shortfall can, in principle, be met through CERs and ERUs. This puts a cap on the EU allowance (EUA) price. Unless there are differences in risk (the reason for the current price differential), compliance buyers will not pay more for an EUA than for a Kyoto (JI or CDM) credit.

But why would Kyoto credits cost so little? The CDM and JI pipeline looks healthy and continues to grow. Although the quality of some carbon portfolios – and their ability to deliver – is probably exaggerated, there should be more than enough inventory to meet the likely demand, both private and public. Sellers will then have to choose between selling surplus assets cheaply in the first commitment period or banking them into the post-2012 world.

The prospect of a tight (and well-regulated) post-2012 market would make banking more attractive and hence raise prices during the Kyoto Protocol period. It is likely that such a regime will eventually emerge (the EU, for one, is committed to a third ETS phase), but as long as the post-2012 world remains uncertain, traders will apply a hefty discount to post-2012 carbon - a discount that is sufficient to keep current prices below € 20.

More information on the Global Carbon Report 2007 is available from info@ideacarbon.com or on www.ideacarbon.com.

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Building Capacity for JI Projects in Russian Coal Sector

By Alexey Smyslov and Eugene Utkaev*

Presently, the Russian coal-mining sector is responsible for about 13% of the country's total anthropogenic emissions of methane, which is about 3% of the total Russian GHG emissions. Nearly 90% of all Russian methane emissions take place in Kuznetskii and Pechora coal basins. Despite the fact that improved capture of coalmine methane has become one of priority measures in the new 'Russian Energy Sector Strategy until 2020,' currently no approved standards and building codes exist for the design of coalmine methane utilization facilities (e.g. boiler houses, methane fueled generator station).

Consequently, most of the investments in the Russian coal-mining sector are nowadays directed towards expansion of coal production capacity. Only a few coal-mining companies in the Russian Federation are currently exploring investments in equipment for methane drainage and subsequent utilisation or destruction of the methane captured from the mines. Nevertheless, some pilot project activities are taking place in the field of coalmine methane capture and utilisation.

One example of these activities is the programme "Russia – Removing Barriers to Coal Mine Methane Recovery and Utilization", which has been managed by UNDP/GEF and which operates in Kuznetskii coal basin (Kuzbass), the leading coal mining area in the Russian Federation, located in the southern part of West Siberia within the Kemerovo region. The project aims at strengthening the institutional and financial framework for realizing coalmine methane utilization projects in the region.

Presently, in Kuzbass 44 underground coal mines are operational, which emit nearly 0.7 billion m^3 (bcm) of methane annually. None of this methane is presently utilized. An increase in coal production by 50% in 2010 would lead to an increase in annual emissions of methane of around 1.05 bcm.

The programme started in September 2003, with the Russian Ministry of Economic Development and Trade (before: Ministry of Fuel and Energy) acting as the National Executing Agency for the activity. The NGO 'Uglemetan', which is based in Kemerova, is the implementing agency for the programme (see Box 1). As part of the programme, currently the first demo project *'CMM Utilization in a Modular Boiler Station on Komsomolets Mine'* is underway.

Although the GEF financing terms do not allow considering this project as a JI activity (for reasons of financial additionality), it offers a good opportunity to realistically demonstrate what a JI project in coalmine methane capture and utilisation would look like in the Kuzbass context.

Thus, the demo project could provide a basis for replication activities in the Russian

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coal-mining sector under the emissions trading mechanisms of the Kyoto Protocol.

A specific characteristic of the demo project is the utilisation of captured methane for thermal energy production. For that purpose, a modular boiler station (MBS) with 0.7 MW designed capacity will be constructed, which will use methane supplied from the nearby vacuum pump station. The MBS, which is now being manufactured in the neighbouring Altai region by Biisky Kotelny Zavod, will be equipped with meters for monitoring, a gas preparation unit, an automatic burner with a flame arrester, moisture separators, and a safety shut-off valve.

It will be able to utilise 2 m^3 of pure methane per minute . The plant is expected to be commissioned in November of this year on the production ground of Komsomolets mine. It will be the first boiler station equipped with gas burners to combust coalmine methane for thermal power production and to demonstrate the coalmine methane utilisation potential in Kuzbass. The project has been discussed with the beneficiary organization OAO SUEK (Russia's major coal group which covers nearly 30% of the domestic coal market and which is responsible for 20% of all Russian coal exports) and the Kemerovo Regional Administration. It has undergone all required expertise checks.

In order to calculate the emission reduction of methane that such an investment could generate, the project participants applied GHG accounting methodologies for coalmine methane capture and utilisation projects already approved by the CDM Executive Board. In particular, for the baseline calculations, they applied the methodology ACM0008 'Consolidated Baseline Methodology for Coal Bed Methane and Coal Mine Methane Capture and Use for Power (Electrical or Motive) and Heat and/or Destruction by Flaring'. Using this methodology shows that the demonstration project results in a reduction of CO_2-eq. emissions of 172.6 ktonnes per year during the period 2008-2012 or 863.3 ktonnes CO_2-eq. for this entire period.

In order to further explore the potential for JI activities in Kuzbass coal mines, Uglemetan, with support of the Global Opportunity Fund (GOF) at the British Embassy in Moscow, and within the framework of its *Climate Change and Energy Programme*, started the project called 'Building Capacity for Effective Implementation of the Kyoto Protocol in Kuznetsk Coal Basin of the Russian Federation'.

Box 1. NPO "Uglemetan" – A knowledge center for modern CMM utilization technologies

Over the last 10 years, Kuzbass welcomed many international initiatives to improve the efficiency and safety of coal production and to reduce CMM emissions. Many of these initiatives were coordinated and initiated by the not–for profit organization "International Coal and Methane Research Center- "Uglemetan". The Center was set up jointly by the Institute of Coal and Coal Chemistry of Siberian Branch of the Russian Academy of Science (SB RAS) and U.S. EPA. Focusing its activity primarily on communicating international experience on CMM recovery and utilization to Russian coal companies, "Uglemetan" has evolved today into an experienced CMM utilization advisor and a carbon documentation developer for JI projects in coal mining sector. Possessing up-to-date laboratory equipment, "Uglemetan" conducts field tests for detection of coal seams filtration properties (permeability, skin factor etc.) and is certified to undertake leak detection and measurements on pipelines, gas holders and other technological facilities using GtiSM Hi-FloTM Sampler.

OAO SUEK has expressed its interest in taking part in this project and to install 68 gas generator units fuelled by captured methane. These units will have a capacity of 1.5 MW of electrical power and 1.6 MW of thermal power. The company will also develop methane emission accounting techniques in its five most gassy mines. Preliminary assessment indicates that these activities could lead to an emission reduction of 16.5 Mt CO_2-eq. during the first commitment period of the Kyoto Protocol.

Since decision making is often a slow process, it is important that assistance for JI project development, both in terms of technical implementation and GHG accounting, is provided in a timely manner. This enables an increased insight in the JI potential in coal-mine methane utilisation in the Russian Federation and may stimulate capacity building for effective Kyoto Protocol implementation in the Russian coal industry.

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Figure 1. Assembling the first methane fueled MBS for Kuzbass

Variables Underpinning Technology Transfers through the CDM

by Ana Pueyo Velasco*

Technology transfers play a crucial role in climate change mitigation, allowing developing countries to grow following low carbon patterns. This article focuses on factors that improve host countries ability to attract technology transfers through the CDM. Most of this ability is explained by the general investment climate in a country, but the carbon markets have also added new factors to the investment decision: natural resource endowment and effectiveness and transparency of climate policy institutions. The article is based on a study carried out by Ana Pueyo in the framework of PhD research on technology transfers and the CDM.

Definition

The IPCC defines technology transfers related to climate policies as "a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions." For the purpose of this study and to facilitate data gathering, this definition has been narrowed by only considering transfers of technologies that are not business-as-usual in the host country and where the knowledge and resources necessary to make them operational do not exist in the target location.

Methodology

For the purpose of the study, technology transfer flows have been analysed in a sample of 15 CDM host countries: Argentina, Brazil, Chile, Mexico, Peru, China, India, Indonesia, Malaysia, South Korea, Thailand, Vietnam, South Africa, Egypt and Morocco: 938 PDDs which represented around 60% of the CDM pipeline in April 2007 were reviewed for evidence of technology transfers. 674 of these PDDs have also been analysed by Haites, Duan and Seres (2006).[1]

Next, based on a thorough review of applicable economic theories, a set of independent variables have been selected to explain why some host countries show a higher potential to receive new technologies through the CDM than others.

These variables are classified in three groups (see Table 1):

- Climate policy variables: the host country's capacity to deliver emission reductions and the development of its climate policy institutions.
- Economic variables: the host country's ability to attract new investments.
- Natural resources variables: the host country's capacity to host renewable energy projects.

The significance of the set of variables has been tested through a simple cross-sectional regression analysis, where the number of projects with transfers of new technologies in host countries is the dependent variable.

Results

The analysis shows that only around 35% of CDM projects analysed involve transfers of new technologies. Some countries have a higher potential to attract new technologies than others. China, Mexico, Brazil and India attract the highest number of CDM projects with transfers of new technologies, even though in some cases, such as India, they have a small share in the portfolio of CDM projects hosted. Most projects in Argentina, Indonesia, Egypt and Morocco, involve new technology transfers, but due to the small number of CDM projects in these countries, the absolute number of technology transfers is small (see Table 2).

A number of models have been tested to identify the independent variables that make some countries more attractive to receive technology transfers through the CDM than others. A first tested model relates the number of CDM projects with new technology transfers per host country to only its FDI figures. The model shows that 78% of the dependent variable (CDM projects with new technologies) is explained through existing FDI flows. Therefore, a host country's investment climate is a very significant variable determining its attractiveness for transfers of new technologies through the CDM.

Table 2. Results

	% Projects with TT	Total TT projects
China	49	195
Mexico	94	142
Brazil	33	72
India	7	44
Malaysia	70	29
Thailand	65	18
Indonesia	86	18
South Korea	46	13
Argentina	78	10
Peru	38	6
Chile	17	5
Vietnam	50	5
Egypt	100	5
South Africa	29	5
Morocco	80	4
total	36	572

Table 1. Variables CDM technology transfer

Climate Change	
- Carbon intensity of power generation	tCO_2/MWh
- Country Energy intensity 2000	BTU/GDP PPP
- Country carbon intensity 2003	tCO_2e/GDP PPP
- Total emissions 2003	$MtCO_2$
- Rating Climate Change institutions 2006	1 to 10
Economic	
- Gross Fixed Capital Formation (GFCF) 2004	Million USD
- Annual growth of GFCF (2000-2004)	%
- Foreign Direct Investment (FDI)	Billion USD
- GDP growth 2004	%
Natural resources availability	
- Wind resources	GW
- Hydroelectric theoric gross capacity	TWh/year
- Forestry biomass	Million tonnes
- Potencial availability of bagasse	K tonnes
- Per capita availability of agricultural land	Ha

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[1] Haites, E.; Duan, M. And Seres, S. (2006). Technology Transfer by CDM Projects. Margaree Consultants and Tsinghua University. Basic Project.

In a second run, a model was used with more independent variables, which showed that 92% of the variation in new technology transfer through the CDM could be explained by the following variables:

- *Foreign direct investment*. Countries with high FDI have a relatively high probability to receive new technologies through the CDM. This variable shows the fraction of technology transfer taking place for purely economic reasons, independent of carbon market incentives.
- *Climate policy institutions rating* (as elaborated on by PointCarbon). Countries with experienced, transparent and effective climate policy institutions have lower transaction costs of CDM investments and are better able to attract technology transfers.
- *Net gross hydroelectric capacity*. Countries with a large hydropower capacity have a lower ability to attract new technology transfers through the CDM, as they usually have already developed local technologies to exploit this resource and have low emissions in their GHG emissions baseline due to the high percentage of renewable energy in their power generation mix.
- *Potential bagasse availability*. This is an indicator of the availability of biomass resources in the host country. Countries with high bagasse availability (Brazil, China, India) are better able to attract technology transfers through the CDM. Most CDM activities in the present pipeline are biomass projects and they deliver a large contribution to technology transfers through the CDM.

Readers who are interested in the individual contribution of each variable are kindly invited to contact the author.

Conclusion

Technology transfers are found more frequently in larger projects involving foreign investors. Investors in CDM projects do not only take into account purely economic variables of the host country, but also the effectiveness and transparency of its climate policy institutions and its natural resource endowment. Developing countries could increase transfers of clean technology by assessing their renewable energy potential and strengthening their climate policy institutions. It is also important that technologies are adapted to the needs of the host countries.

CDM Issues Addressed: Clean Coal and the ITL

During the past months, a number of technical issues were addressed by the CDM Executive Board and the UNFCCC Secretariat. Two of these issues attracted much attention: the decision on the eligibility of supercritical coal-fired power plants under the CDM, and the announcement by the UNFCCC Secretariat that in November of this year the International Transaction Log will be connected to the EU ETS.

Supercritical coal

The decision to make supercritical coal-based power plants eligible under the CDM was taken by the CDM EB at its 34th meeting on 12-14 September of this year. In supercritical plants coal is milled to a fine powder in a pulveriser and then blown into a combustion chamber of a boiler. The hot gases and heat energy from the combustion process convert water in tubes lining the boiler into steam. This high-pressure steam is passed into a turbine to produce electricity.

Conventional or subcritical coal-fired plants efficiencies typically reach efficiencies of 36-38%. Supercritical power plants, however, operate at higher temperatures and pressures and at significantly higher efficiencies (up to 45%) than subcritical plants for a given power output. In the future, even higher efficiencies can be expected in ultra-supercritical (USC) power plant, operating at very high temperatures and pressure.

When the business-as-usual practice in a country is subcritical coal-based power production, the introduction of supercritical power plants would reduce emissions of GHGs. However, there has been concern about including such modern coal-based plants under the CDM umbrella as this might imply competition with renewable energy technologies in developing countries. At the same time, it was acknowledged that upgrading the efficiency of coal-fired power production would result in additional GHG emission reductions and would in principle be eligible under the modalities and procedures of the *Marrakech Accords*.

The final decision of the CDM EB took the shape of approving a consolidated methodology for new (greenfield) fossil fuel power plants (ACM0013, see p.14 of this issue), and could thus also include natural gas-fired plants. However, in order to limit the scope for these projects, it was decided that the methodology can only be applied in those countries/regions which generate more than half of the electricity using coal or natural gas (measured for a period of three years). In practice, this limits this type of projects to countries such as China, India, and South Africa which presently rely heavily on coal.

Moreover, the number of coal (or gas-based) projects within these countries is also limited since the GHG emissions baseline must contain the emissions data of the 15% most efficient power plants operational in the country (or relevant region within the country), including existing CDM projects. The latter is meant as a limit to CDM fossil fuel plants.

ITL

On 27 August of this year, the UNFCCC Secretariat announced that in November of this year, the International Transaction Log (ITL) will be connected to the registries of the EU ETS. The ITL will, among other tasks, serve as a vehicle to enable international transfers of CERs between countries. For the EU ETS the ITL will be an important mechanism since all transfers between EU ETS installations during 2008-2012 need to be accompanied by similar transfers of assigned amount units (AAUs) between Member States where the trading installations are located.

At the time of writing, seven countries had been approved to operate with the ITL: Austria, the Czech Republic, Hungary, Japan, New Zealand, Switzerland, and the UK. According to the UNFCCC announcement, it is scheduled that in November of this year all EU Member States collectively switch to the ITL. This, however, requires that all states in the EU comply with the registry formalities. In case not all Member States have their GHG emission registries in order, the EU ETS-ITL connection will have to be delayed.

After the UNFCCC announcement in August, the EU ETS forward market showed some turbulence in terms of movement of prices of allowances with expiration dates in December 2008. At first, prices dropped due to expectations that more CERs would enter the market in 2008, which was followed by an increase (to around € 21/tonne CO_2-eq.) as some energy producing companies decided to purchase lower-prices forward EU allowances. The price of issued CERs increased, so that the price spread between EU allowances and CERs decreased to € 3 per tonne.

What Role for Market Mechanisms Post-2012?

by Aaron Cosbey*

A recent study by the International Institute for Sustainable Development (IISD) asks what the various possible post-2012 regimes might mean for a CDM-like mechanism, and what the various types of mechanisms might imply in turn for the regime.

A number of potential future climate change regimes are under discussion, both within and outside of formal UNFCCC processes. Literally, hundreds of proposals for the shape of the post-2012 international climate change regime have been put forward by Parties and the academic community. It is widely hoped that the upcoming Bali COP-MOP will produce some consensus on the broad parameters of the eventual successor regime, but for the moment nothing is off the table.

On one element of the successor regime there seems to be international agreement: it should make use of market forces to further the objectives of the Convention. The current regime employs CDM and JI to this end, but one could imagine a number of different market mechanisms for sustainable development (MMSD) that would play similar roles. IISD has recently surveyed 43 proposed post-2012 regime approaches to see what they implied for MMSDs

Targets with flexibility mechanisms

Some sixteen approaches of this type were identified, and all could accommodate the CDM in more or less its present form. The distinguishing characteristics of such a regime are two-fold. The first is the need for targets, whether they are specified in terms of overall emissions or intensity. The second is the need for the regime to differentiate between those Parties with targets and those without. This is fairly straightforward. The CDM as currently conceived acts as a bridge between these two groups. If there is no such distinction, such as in the case where all countries have similar targets, then there can be no CDM as currently construed.

Targets with emissions trading

Most of the eleven approaches that make up this category are variations on fixed and binding targets for all Parties. In the final event, any regime that assigns targets to all countries cannot have an MMSD that looks much like the current CDM. In such a context, emissions trading would probably be limited to mechanisms much like the current IET and JI, both of which occur between Annex I Parties. But there are a few issues worth considering in that context.

First, the CDM is explicitly aimed at fostering sustainable development in the host countries, and thus arguably delivers some degree of "development dividend". IET and JI have no such explicit aim. On the other hand, it can be argued that JI *implicitly* includes an imperative to foster sustainable development, or at least to serve national interests according to some definition. If a JI project offered no development dividend (*i.e.*, no social, economic or non-climate-related environmental benefits), there would be no reason for a host country to approve it, given that any ERUs it produced would result in increases to the host's emission reduction commitment. In fact, since some percentage of JI projects will inevitably be non-additional, the ancillary benefits of the project roster as a whole will have to be seen by the host to be sufficient to *more* than balance out the resulting effective increases in its assigned amount.

Another implication of JI as a replacement for the CDM is that such a regime would shift the burden for determining additionality away from the international toward the national level (to the extent that the new mechanism functioned like Track 1 JI). That is, at the global level the JI mechanism does not allow for a net reduction in emission reduction commitments, so only the host state needs to be concerned about non-additionality. This would greatly simplify the international administrative machinery as compared to the CDM, but it might also result in inefficient duplication of similar efforts at each national level.

From a developing country perspective, the CDM is a more or less unblemished good. A JI-type mechanism that covered developing countries would bring the same sorts of benefits to host countries, but unlike CDM where the host country receives a portion of the resulting credits, such a mechanism would see all credits accruing to the home country, counting toward its reduction commitment. In effect, this requires hosts to give up low hanging fruit for the emissions reduction benefit of others. As such, developing countries would presumably need to be compensated in the design of the regime for losing the CDM.

Expanded CDM

Nine of the approaches surveyed involved some sort of expanded CDM – one that seeks to overcome perceived constraints of the current project-based approach by resort to policy-based and programmatic CDM, or through an MMSD based on sectoral crediting.

From a regime perspective, the key difference between the narrow and expanded versions of the CDM is scale. It has been widely argued that the expanded version of the CDM would vastly increase the potential for generating credits, perhaps well beyond what the market would bear in terms of demand, and the study surveys research that seems to confirm this risk as credible. This may be good news for buyers, but only up to a point. If the market becomes swamped, it will crash, with values for CERs coming in at well below what proponents projected, potentially leading to significant abandonment of project-based initiatives. One clear implication for a regime that includes an expanded CDM is the need for ambitious reduction targets that will fuel demand for additional CERs, though if prices are low enough, the expanding voluntary market may pick up some excess supply – perhaps a significant amount.

It is also important to note that the more attractive the CDM becomes in a post-2012 regime, other things being equal, the less incentive any developing country has to take on targets that entail lost access to the mechanism.[1] If the post-2012 regime radically expands the capacity of the CDM to cover policy-based and programmatic initiatives, it is offering governments the opportunity to fund a variety of policies

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[1] The assumption of other things being equal is important. It is possible to imagine a regime with tough enough developed country targets and generous enough allowances for developing countries to overcome the disadvantage of losing the CDM as a mechanism.

that they might have as current priorities, but for which they lack the requisite resources. This clearly counts as making the CDM a more attractive mechanism.

Other approaches

Another possibility, not advocated in any of the approaches surveyed, is based on the original proposal from Brazil that led to the creation of the CDM. This fund-based mechanism is discussed because, uniquely among the options described, it can operate outside a regime of internationally agreed targets.

A fund-based mechanism could have a scope similar to the CDM and would consist of mandatory contributions from UNFCCC Parties, the nature and extent of the contributions being a matter of negotiation. This fund would purchase emission reduction credits from GHG-reducing projects, policies or programmes in developing countries. If the Fund operated under a regime with targets, the credits involved could be used to retire obligations of the funders, assigned in proportion to contributions. If it operated under a regime without targets, it would be considered a straight funding mechanism.

In conclusion, there is considerable uncertainty about the long-term nature of the carbon market, given that governments have not yet entered into explicit negotiations on future actions to reduce GHG emissions. The considerations noted here highlight the importance of foresight and planning in the regime design if indeed Parties want to preserve some sort of MMSD post-2012.

ENTTRANS Workshop on 'CDM energy technologies for sustainable development in Kenya'

A workshop was held on 10-11 July 2007 in Nairobi with a view to exploring how the CDM could be improved to enable low-carbon technology transfer. The workshop is part of the EU funded ENTTRANS project investigating the potential of transferring and implementing sustainable energy technologies through the CDM. Similar workshops have been held in Thailand, Chile, Kenya, Israel and China (see also JIQ, April June 2006). Reports on the these workshops will follow in forthcoming JIQ issues.

The main aims of the workshop were

- To feedback the results from the questionnaire on energy needs and technology priorities
- To explore the existing market system into which a new technology would be introduced through the CDM by using an approach called 'market mapping'.
- To explore how the CDM affected this process at the international and national levels and also how it could facilitate market adoption.

The participants were invited from a range of possible market actors and explored the existing market chains, enabling business environment and support services for a number of technologies using a 'market mapping' approach. The interface with the CDM was then explored to derive actions which could be taken to improve the operation of the CDM. A key outcome which was unforeseen was that the participants decided to form a network to be organised by KIRDI to progress the generation of CDM project proposals and market transfer.

The workshop took place over one and a half days. After the welcome, the results of the questionnaire survey and interviews with stakeholders in Kenya (held in 2006-07) on priority needs and technologies were presented by Daniel Theuri of Practical Action. This covered the ranking of the energy service needs, the list of technologies considered suitable to meet those needs within the country context and other technologies which were suitable but unfamiliar and therefore not given priority. This formed the basis for the selection of the technologies which would be used for the market mapping (see below).

The next sessions of the workshop were concerned with mapping the market into which these technologies would be placed. From the technologies list, it was agreed that concentrating solar power (CSP) as a large-scale technology and biomass gasification stoves (BGS) as a small-scale technology could be explored. The participants were then divided into two groups for the market mapping exercise (for the market mapping approach, see Albu and Griffiths, 2006[1]; see also *JIQ*, April 2007, p.6).

Information on the perceived performance of the CDM was elicited by examining the following set of questions in terms of the positive and negative aspects of the CDM performance.

1. How effectively does the CDM support technology transfer?
2. How well is the CDM aligned with the country strategy?
3. How efficient is the CDM host country operation?

For each question, possible ways for improvement were discussed and then these activities were prioritised into an action plan.

At the end of the final session and discussions the participants were asked for their advice and direction for the future. The following is a summary of the main comments made on the workshop and follow-up suggestions.

Most participants enjoyed the workshop and thought it useful, informative and timely. A possible follow-up workshop and the need for industry support were mentioned. The participants felt that an increase in awareness and chief executives involvement were necessary. The DNA for the CDM needs to be involved in a dialogue with industry.

The key outcome from the meeting was that participants recommended a follow-up workshop and said that they would organise themselves into a network to hold meetings to follow up on the issues raised on the operation of the market and technology transfer with the objective of progressing CDM project proposals. KIRDI (the Kenyan Industry Research and Development Institute), which is funded by the Government of Kenya, offered to organise the meetings, possibly on a monthly basis.

[1] Albu M. and A. Griffiths, 2006, Mapping the market: participatory market chain development in practice, *Small Enterprise Development*, Vol.17 No.2, pp12-22

Concentrating Solar Power

ENTTRANS

Concentrating Solar Power (CSP) systems transform the energy from the sun in electricity. They can be located in deserts or any high insolation area. The size of the area required for the mirrors varies according to the output required and the type of system. It has been calculated that if 0.5% of the world's deserts were used for this technology, it would supply all the world's electricity requirements by 2050.

There are three basic designs for CSP, which use mirrors to concentrate the energy from the sun onto a receptor vessel. Subsequently, a liquid or gas is heated and then used to power a steam turbine (see Figure 1 and Box 1). By using the heat from the system, the units can also be used in a combined heat and power mode. Heat can be used in a desalination plant and for solar assisted air conditioning. The *Parabolic Trough technology* has been pursued in Europe and the South-western USA. The most famous example is the 354 MWe Solar Energy Generating Systems (SEGS) plant in California, USA, which has been operating since the 1980s. The back-up energy is based on gas-fired burners when there is insufficient sunshine. The plant has 2 million m^2 of mirrors. Within Europe, Italy and Spain are very active while Germany is active in the field of technology development.

Box 1. Types of CSP

A simple *parabolic dish* focuses the sun's energy onto a thermal receiver mounted at the focal point of the dish. Temperatures higher than 1000°C can be reached. However, a dish is limited by size so that the output is about 25 kWe maximum from one dish. Another type is the *'central receiver'* type or solar tower, which has thousands of mirrors able to track the sun and these are arranged around a central tall tower. A heat transfer fluid (such as a molten salt, air, water/steam, liquid sodium) flows through the receiver collecting the heat. The temperatures involved are in the region of 300-1,000°C. This is then used to make steam to generate electricity with power outputs in the range 30-200 MWe. If air is used at 1,000°C, then it can be used directly in a gas turbine (60% efficiency) replacing natural gas.
The third type of arrangement is the *parabolic trough principle*. The parabolic trough mirror tracks the sun and may be up to 100 m long. At the focus of the mirror is a heat pipe, which carries away the heat produced. The temperature range is lower at 200-400°C and arranging the troughs in rows allows a flexible power output ranging from 30 to 350 MWe. Both the Parabolic Trough and the Power Tower designs allow thermal storage facilities, which can overcome the problem of providing power in the evening.

sustainable development

Environmentally there could be many benefits from CSP systems. An important possible application would be that through high voltage direct current (HVDC) grids different countries would be linked with countries with a high CSP potential. According to Trieb *et al.* (2002), Europe's electricity could thus be provided through a supergrid connection with countries in North Africa. By 2050, this could almost fully phase out the need for fossil fuels and nuclear power in Europe. This would allow a 70% reduction in CO_2 emissions from electricity production over the period until 2050. Next to the GHG emission reduction potential of any CSP plant, the environmental impacts to flora and fauna and biodiversity are very low with no pollution being emitted and no safety problems associated with the technology. Noise is also low and there are no decommissioning problems.

The energy potential from CSP is very large wherever there are desert regions on the globe. A combination of land area and direct normal irradiation (DNI) is required in order to fully exploit the resources. Suitable sites can be identified by combining satellite data on DNI with land use and topography data, which are then combined with information on infrastructure availability and natural risks. This enables a ranking of available sites with likely costs.

The potential for other sustainability benefits from CSP is large with the potential for local revenues from the electricity supply and from the possible desalination plants, as well as the possibility of other economic activities contributing to the local economy. Additional opportunities can arise from the configuration of the plant as the mirrors are very large and create shaded areas underneath, which can be used for horticulture irrigated by desalinated water generated by the plants. The cold water produced can also be used for air-conditioning, which implies that the overall energy efficiency of the plants can be increased to 80-90%.

Trieb F, Knies G, and Czisch G, 2002, Combined Solar Power and desalination plants for the Mediterranean region- Sustainable Energy Supply using Large Scale Solar Thermal Power Plants, EUROMED 2002, Sinai, Egypt.

JIQ Series on Clean Technologies

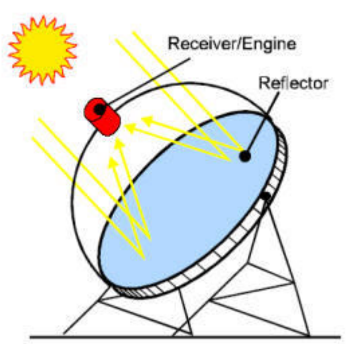
The EU-funded research activity ENTTRANS describes a number of low-carbon sustainable energy technologies in different categories: cooking, heating and cooling, electricity production, energy efficiency, lighting, and carbon capture and storage. For each of these technologies the main characteristics and functions are explored, as well as their availability in different parts of the world, their implementation chain characteristics, and how the CDM could enhance their implementation. JIQ briefly describes these technologies in a series of articles. This issue: CSP

The background description for this article has been prepared by ENTTRANS partner Dr. Katherine Begg (University of Edinburgh, UK).

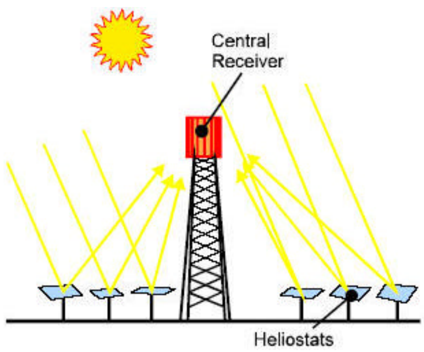
These benefits can accrue to the local economies containing the desert sites suitable for the technology, irrespective of whether they are in developed or developing economies. The vision of a pan European market using a new HVDC link, as explained above, with renewable power fed in from all member states and by North Africa means that both Europe and Africa would benefit with consequent economic benefits, such as, for instance, income increase, job creation and poverty alleviation. The Middle East could also benefit from such technology.

Applicability

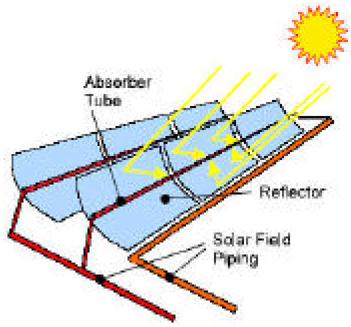
The economic and market potentials could be high if CSP capital costs would decrease with large-scale mirror production. The running costs of the systems are low. Coupled to that is the impetus to avoid climate change risks using low GHG emission technologies and the emergence of preferential feed-in tariffs. There are conflicting estimates of the future costs and market penetration, but Brakmann *et al.* (2005) predict that electricity from *parabolic trough* plants could fall to USD cents 7-8 in the medium term compared to the current USD cents 14-17 /kWh from the 354 MW installed in the USA. *Central receivers or solar tower* systems are not so well developed for commercial use yet, but there is investment for 30-50 MW in Spain. As discussed above, the technical potential of solar thermal systems is very large for those sites with the appropriate topography, DNI and infrastructure. Brakmann *et al.*



Parabolic Dish System



Power Tower System



Parabolic Trough Principle

Figure 1. Possible systems for CSP - source: http://www.solarpaces.org/csp_technology.htm

(2005) demonstrate that there are no barriers to supplying 5% of the world's electricity needs from solar thermal power by 2040. In order to make CSP competitive with other sources, which have been subsidised over a long period of time, political and financial support is required. The skills to make the plant are already available in the EU and USA and with experience being gained in many other countries these skills are expanding. As the technology tends to be in areas remote from centres of population, infrastructure is needed in the form of a HVDC link for long-distance transmission or the normal high-voltage alternating current (HVAC) links for shorter distances.

In order to lower investment risks, new solar power markets must be backed up by national laws for a stable and long-term market. The EU target of doubling the share of renewable energy sources from 6 to 12% by 2010, though not legally binding, is an example of the kind of incentive needed (EU Directive 2001/77/EC). The USA has the *Renewable Portfolio Standards* to increase the contribution of renewable power and to penalise utilities financially if they do not reach targets of 2-5% of total demand by 2005 and 2010 respectively. As a result, the states of Nevada and Arizona are negotiating their long-term power purchase agreements for new solar thermal power while California has raised their renewable energy target to 20% in 2015 and 30% in 2020. The Global Market Initiative (GMI, http://www.solarpaces.org/GMI.HTM) launched in 2003 to expedite the building of 5000 MWe of CSP systems worldwide to 2013 is open to all interested countries and states.

Other activities include research on new combinations and materials to increase efficiency and cost effectiveness, and scaling up systems in size with demonstration funding. In 2004-5, there were only 300 MW of firm projects, where several thousands of MW are required for a viable commercial competitiveness.

Mainly through funding from GEF and other international organisations, private companies and national governments, the following developing countries are already involved in developing CSP plants (all *parabolic trough* design plants). These include: Algeria, Egypt, India, Iran, Mexico, and Morocco. Other countries interested or actively pursuing CSP are Jordan and South Africa. The technology has a high potential for most developing countries and could contribute to a low-carbon, secure, and low-cost electricity future. However, most initiatives in developing countries seem to have been delayed by national institutional problems. This is an area that could be addressed by, for instance, the CDM.

Costs and opportunities

There are wide variations in assessments of costs of electricity production and capital costs of CSP plants depending on assumptions and state of development of the different designs. Brakmann *et al.* (2005) report that the costs of *parabolic trough* CSP dropped from USD 4,000/kWe to under USD 3,000/kWe due to scaling up from 30 to 80 MWe units between 1984 and 1991. In 1999, the World Bank assessment of installed capital costs were USD 3,000 – 4,000/kWe for 30-200 MWe *Rankine cycle* plants and USD 1,200/kWe for a 130 MWe *hybrid Integrated Solar Combined Cycle plant (ISCC)* with 30 MW equivalent solar capacity. Generation costs range from USD cents 13/kWh to less than USD cents 9/kWh for ISCC plants. The projections indicate that CSP plants at good solar sites can compete at peaking and mid-load with coal or oil-fired plants. Larger solar field areas also provide scope for cost reductions. Current generation costs of the *parabolic trough* grid in southern California are USD cents 12-15/kWe.

Among other EU-supported studies and activities, the European *parabolic trough R&D programme* consortium (EuroTrough), funded by the EU, is making improvements in structural design and optical accuracy of CSP systems (consortium: German Aerospace Center, Germany; PSA, Spain; Schlaich Bergermann und Partner, Germany; INABENSA, Spain; CIEMAT-PSA, Spain; FLABEG Solar International, Germany). Prototypes have been successfully demonstrated and were added to the SEGS plant in California in 2003 and have been in continuous operation. Funding has been made available by the German SKAL ET consortium and the German Ministry of Environment. In Australia a CSP technology is being supported with a plant attached to an existing coal-fired power station in New South Wales for pre-heating steam. An extension from 1 MWe to 5 MWe has been commissioned with plans for 35 MWe.

The International Energy Agency (IEA) manages a collaborative programme called *SolarPACES* (http://www.solarpaces.org/GMI.HTM) which is an international co-operative organisation bringing together teams of national experts from around the world to focus on the development and marketing of CSP systems.
The GEF and national governments have facilitated *parabolic trough* technology and specifically the ISCC hybrid projects in Algeria, Egypt, Iran, India, Mexico and Morocco. Algeria has set up its own national programme without GEF support for the promotion of renewable energy sources and proposes a 150 MW ISCC plant. Mexico is planning a 250 MWe gas fired CC plant with solar fields of 25 MWe with a grant from GEF for the solar part. In Morocco the African Development bank in co-operation with the GEF has helped to fund a 220 MW ISCC plant due to start operation in 2008. In Egypt the National Renewable Energy Agency has, with co-financing, commissioned a national utility-owned project comprising a solar plant and an ISCC to be operational by 2008.

Brakmann, G., R. Aringhoff, M. Geyer, and S. Teske, 2005. Concentrated Solar Thermal Power – Now!, Greenpeace, ESTIA, IEA Solarpaces.

Post Kyoto Talks and Negotiations

During the past couple of months, a number of important, high-level meetings took place on climate change policy. First, in July an informal thematic debate on climate change was organised by the UN General Assembly. In August, the Ad-hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol held its fourth session. In September, the US Government hosted a so-called Major Emitters' meeting.

UN General Assembly Climate Debate, July-August

The *Informal Thematic Debate of the UN General Assembly on Climate Change as a Global Challenge* took place in New York (USA) on 31 July – 2 August of this year. The discussions were organised in two panel meetings and a general discussion. One panel discussion was on the science, impact, and the adaptation imperative of climate change, and the second one was on mitigation strategies in the context of sustainable development.

The sessions were addressed by, among other speakers, Sir Nicholas Stern (London School of Economics, UK), Jeffrey Sachs (Earth Institute-Columbia University, USA), John Holden (Harvard University, USA), Sunita Narain (Centre for Science and Environment, India), Björn Stigson (World Business Council for Sustainable Development), and Yvo de Boer (UNFCCC Secretary General). During the general discussion, country representatives delivered statements.

The key themes of the discussion were:

- The relation between climate change and development.
- The synergies between climate change policy and energy policies.
- The need for adaptation strategies and funds.
- The shape of the post-2012 global climate policy framework, and
- The choice of the most effective instrument for meeting future emission reduction goals.

According to Stern, by 2020 developed countries would need to reduce their emissions by 20 to 30% below 1990 levels, to be followed by a further reduction of 75% by 2050. In this strategy, he suggested an extension of policy instruments for co-operation with developing countries beyond the CDM, in order to enlarge the scope for GHG emission reductions in these countries. He also expressed support for including clear measures for preventing deforestation in a future climate regime, as well as an increased focus on adaptation.

Sachs underscored that energy, transport and preventing deforestation will be three key activity areas for a new climate regime. He also mentioned that not all these sectors are ideally suitable for trading of GHG emission allowances, so that carbon taxes may be easier to regulate and monitor.

De Boer explained that the process to be started in Bali (generally referred to at the meeting as *Bali roadmap*) could lead to a climate policy regime with ambitious targets (as already announced by among others the EU) although industrialised countries will be cautious about negative effects on their competitiveness. On the other hand, for developing countries poverty alleviation and achieving economic growth are very important issues.

In De Boer's view, the post-2012 framework should also include incentives for developing countries to: limit growth of their GHG emissions, support clean energy technology transfer and implementation, and address concerns about competitiveness and economic growth.

Several speakers and country representatives expressed their hope that COP-MOP-3 in Bali (Indonesia, 3-14 December of this year) would lead to a decision on a 'Bali Roadmap' and also hoped that this roadmap would contain a stronger involvement of the private sector, given the latter's major role in investments in future energy and industrial infrastructure, which makes them an important overall climate policy stakeholder.

UN High-level Climate Change Summit, September

On 24 September of this year, during the same week of the Major Emitters Conference (see below), UN Secretary-General Ban Ki-Moon convened a high-level climate change summit in New York. Participants, whowere high-level government representatives including more than 70 heads of state, declared that "an ambitious, comprehensive climate agreement will be negotiated within the UN Framework Convention on Climate Change — building on the Kyoto Protocol — by no later than 2009".

This declaration was another token of the increasing support for the launch of negotiations on a future climate policy regime in Bali at COP-MOP-3 and COP-13, with a completion of those negotiations by 2009.

Vienna Climate Change Talks 2007

On 27-31 August of this year, in Vienna (Austria), the fourth meeting of the *Ad Hoc Working Group for Annex I Parties under the Kyoto Protocol* (AWG-4) and the fourth workshop under the *Dialogue on Long-Term Cooperative Action* under the UNFCCC were held. The sessions were considered important preparatory meetings for the upcoming climate regime negotiations at COP-MOP-3. The main objective of the meeting in Bali is that Parties agree on a mandate for negotiations on a future UN-based climate policy regime for the period after 2012.

The Vienna meeting was succesful in the sense that the outcome was a token of ambition, although delegates realised that much work remains to be done before a new climate policy protocol can be completed. At the 'Dialogue' workshop, it could be noted that among the topics discussed was that of differentiation of activities for developing countries. Presently under the Kyoto Protocol, developing countries are categorised as non-Annex I Parties, but during the workshop discussions delegates from least developed countries and the Alliance of Small Island States (AOSIS) mentioned that also within the group of non-Annex I Parties some differentiation might be needed in the future. This could imply that in a future climate regime some rapidly industrialising developing countries might undertake activities to limit the growth of their GHG emissions.

In the context of AWG-4, Kyoto Protocol Parties agreed that industrialised countries, as a group, would need to have the ambition to reduce their GHG emissions by 25 to 40% below 1990 emission levels by the year 2020. Although this agreement is not legally binding and no guarantee that one of these emission reduction percentages will be included in the text of a future climate policy regime, it is considered important, in particular because of Parties' motivation for the agreement. It was generally acknowledged by Parties that, given the recent IPCC reports, it is important that global GHG emissions must reach a peak at the shortest notice possible, *i.e.* between 10 or 15 years from now, and that emissions are reduced by 50% below 1990 levels by the year 2050. This would help to keep the average global temperature increase below 2^{0}C (compared to pre-industrial times levels).

With respect to policy instruments it was stated by countries that additional instruments beyond the CDM are needed to address the GHG emission levels in developing countries. In this context, there were references to 'other' or 'new' market mechanisms although no specific suggestions on this were included in the final texts.

See also http://www.iisd.ca/climate/awg4/ and http://unfccc.int/meetings/items/2654.php

Major Emitters Conference, Washington, D.C.

The US Administration organised a Conference on Climate Change in Washington, D.C. on 27-28 September of this year. Government representatives from the seventeen largest economies were present at the conference, which was also referred to as the Major Emitters meeting. In his address to the conference, US President Bush repeated his preference for a climate policy strategy focused on promoting clean energy technologies and voluntary actions by countries. He rejected solutions that would be based on legally binding national level, quantified GHG emission reduction commitments: "Each nation must decide for itself the right mix of tools and technologies."

President Bush also proposed the establishment of an international Clean Technology Fund. The key message from the discussion at the conference in Washington and delegates' reactions in the margin of the meeting, however, was that promoting transfers of clean technologies to developing countries is extremely important, but that this requires a firm international policy regime with targets and policy instruments instead of voluntary measures on an individual country basis. It was also underscored by several reactions that climate change is a global issue where actions by individual countries have international impacts in terms of sustainable development and economic competiveness.

Domestic pressure on Bush to support international climate targets

On 25 September of this year, shortly before the Major Emitters Conference, the Speaker of the US House of Representatives, Ms Nancy Pelosi, and US Senate Majority Leader, Mr Harry Reid, sent a letter to President Bush, in which they called upon him to support an international climate policy agreement with "mandatory limits for developed nations and creation of a global carbon market that enables enhanced participation by large developing nations."

They criticised the policy of the Bush administration to pursue an approach which is different from the Kyoto Protocol track and which is based purely on aspirational and non-binding targets: "This voluntary approach, Mr. President, cannot succeed in staving off catastrophic climate change impacts."

Ms Pelosi and Mr Reid asked President Bush not to start "a separate process competing with negotiations under the United Nations Framework Convention on Climate Change, to which the U.S. is a party, and which is the world's recognized forum for hammering out the international response to global warming."

Moreover, they expressed their disappointment that the nations that are most vulnerable for the adverse effects of climated changen were not invited to the above-mentioned Washington Conference of 27-28 September.

Yvo de Boer address at European Parliament hearing

On 4 October of this year, UNFCCC Secretary General Yvo de Boer addressed the second public hearing of the Temporary Committee on Climate Change (CLIM) of the European Parliament in Brussels, Belgium. The session's theme was the 'Climate Protection Challenge Post-2012'.

In his address, Mr De Boer gave an overview of the latest developments, initiatives and proposal taken and formulated by countries to shape a future climate policy regime. He mentioned the G-8 Communiqué at Heiligendamm (Germany) earlier this year, the EU intention to reduce GHG emissions by 20 to 30% by the year 2020, the common position of the EU and Japan that GHG emissions would need to be 50% below 1990 levels by 2050, and the clear call from the UN high-level Event on Climate Change in September in New York (see p.12 of this issue) for a breakthrough at the COP-MOP session at Bali in December.

Mr De Boer explained that the 'Bali Roadmap' "will need to set in set in motion negotiations and establish the two-year process to work on the … building blocks [adaptation, mitigation, technology, financial architecture, *ed*.]. This work will need to take inter-linkages among the building blocks into account and ensure that the synergies between the building-blocks are tapped, in order to ensure an enhanced and effective response to climate change post-2012."

He explained that the Ad-hoc Working Group on Further Commitments for Annex I Parties (AWG) is expected to "seek agreement on a timetable and date to conclude work to avoid a gap between the end of the first commitment period and a new regime in 2012."

Finally, Mr De Boer gave an overview of the major issues in the debate on a future climate policy regime. These are:

- Nature of the emission reduction target (*i.e.* medium-term or long-term, binding or non-binding, engagement and incentives for developing countries).
- Sufficient and sustained funding for adaptation.
- Deforestation, which presently contributes up to 20% of global GHG emissions.

For the full text, see: http://unfccc.int/files/press/news_room/statements/application/pdf/071004_eu_parliament.pdf

CDM Methodologies approved by the CDM Executive Board

(updated 8 October 2007)

Approved large-scale project methodologies (49)

Meth. No.	Type of project
AM0001	Incineration of HFC 23 Waste Streams
AM0002	Greenhouse gas emission reductions through landfill gas capture and flaring where the baseline is established by a public concession contract
AM0003	Simplified financial analysis for landfill gas capture projects
AM0007	Analysis of the least-cost fuel option for seasonally-operating biomass cogeneration plants
AM0009	Recovery and utilization of gas from oil wells that would otherwise be flared
AM0010	Landfill gas capture and electricity generation projects where landfill gas capture is not mandated by law
AM0011	Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario
AM0013	Avoided methane emissions from organic waste-water treatment
AM0014	Natural gas-based package cogeneration
AM0017	Steam system efficiency improvements by replacing steam traps and returning condensate
AM0018	Steam optimization systems
AM0019	Renewable energy project activities replacing part of the electricity production of one single fossil fuel-fired power plant that stands alone or supplies electricity to a grid, excluding biomass projects
AM0020	Baseline methodology for water pumping efficiency improvements
AM0021	Baseline methodology for decomposition of N2O from existing adipic acid production plants
AM0022	Avoided wastewater and on-site energy use emissions in the industrial sector
AM0023	Leak reduction from natural gas pipeline compressor or gate stations
AM0024	Methodology for greenhouse gas reductions through waste heat recovery and utilization for power generation at cement plants
AM0025	Avoided emissions from organic waste through alternative waste treatment processes
AM0026	Methodology for zero-emissions grid-connected electricity generation from renewable sources in Chile or in countries with merit order based dispatch grid
AM0027	Subsititution of CO2 from fossil or mineral origin by CO2 from renewable sources in the production of inorganic compounds
AM0028	Catalytic N2O destruction in the tail gas of Nitric Acid Plants
AM0029	Methodology for Grid Connected Electricity Generation Plants using Natural Gas
AM0030	PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities
AM0031	Methodology for bus rapid transit projects
AM0033	Use of non-carbonated calcium sources in the raw mix for cement processing
AM0034	Catalytic reduction of N2O inside the ammonia burner of nitric acid plants
AM0035	SF6 Emission Reductions in Electrical Grids
AM0036	Fuel switch from fossil fuels to biomass residues in boilers for heat generation
AM0037	Flare reduction and gas utilization at oil and gas processing facilities
AM0038	Methodology for improved electrical energy efficiency of an existing submerged electric arc furnace used for the production of SiMn
AM0039	Methane emissions reduction from organic waste water and bioorganic solid waste using co-composting
AM0040	Baseline and monitoring methodology for project activities using alternative raw materials that contain carbonates in clinker manufacturing in cement kilns
AM0041	Mitigation of Methane Emissions in the Wood Carbonization Activity for Charcoal Production
AM0042	Grid-connected electricity generation using biomass from newly developed dedicated plantations
AM0043	Leak reduction from a natural gas distribution grid by replacing old cast iron pipes with polyethylene pipes
AM0044	Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors
AM0045	Grid connection of isolated electricity systems
AM0046	Distribution of efficient light bulbs to households
AM0047	Production of waste cooking oil-based biodiesel for use as fuel
AM0048	New cogeneration facilities supplying electricity and/or steam to multiple customers and displacing grid/off-grid steam and electricity generation with more carbon-intensivefuels
AM0049	Methodology for gas based energy generation in an industrial facility
AM0050	Feed switch in integrated Ammonia-urea manufacturing industry
AM0051	Secondary catalytic N_2O destruction in nitric acid plants
AM0052	Increased electricity generation from existing hydropower stations through Decision Support System optimization
AM0053	Biogenic methane injection to a natural gas distribution grid
AM0054	Energy efficiency improvement of a boiler with oil/water emulsion technology
AM0055	Baseline and Monitoring Methodology for the recovery and utilization of waste gas in refinery facilities — Version 1
AM0056	Efficiency improvement by boiler replacement or rehabilitation and optional fuel switch in fossil fuel-fired steam boiler systems — Version 1
AM0057	Avoided emissions from biomass wastes through use as feed stock in pulp andpaper production — Version 1

For most up to date information regarding approved and consolidated methodologies, see:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

Approved Consolidated Methodologies (12)

ACM0001	Landfill gas project activities
ACM0002	Grid-connected electricity generation from renewablesources
ACM0003	Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture
ACM0005	Increasing the blend in cement production
ACM0006	Grid-connected electriciy generation from biomass residues
ACM0007	Conversion from single cycle to combined cycle power generation
ACM0008	Coal bed methane and coal mine methane capture and use for Power (electrical or motive) and heat and/or destruction by flaring
ACM0009	Industrial fuel switching from coal or petroleum fuels to natural gas
ACM0010	GHG emission reductions from manure management systems
ACM0011	Fuel switch from coal and/or petroleum fuels to natural gas in existing power plants
ACM0012	GHG emission reductions from waste gas or waste heat or waste pressure based energy system
ACM0013	Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology — Version 1

Approved Afforestation and Reforestation Methodologies (8)

AR-AM0001	Reforestation of degraded land
AR-AM0002	Restoration of degraded lands through afforestation/reforestation
AR-AM0003	Afforestation-reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing
AR-AM0004	Reforestation/afforestation of land currently under agricultural use
AR-AM0005	Afforestation and reforestation project activities implemented for industrial and/or commercial uses
AR-AM0006	Afforestation/Reforestation with trees supported by shrubs on degraded land
AR-AM0007	Afforestation and reforestation of land currently under agricultural or pastoral use
AR-AM0008	Afforestation or reforestation on degraded land for sustainable wood production — Version 1

Meetings, books, studies and reports

Recent meetings

EU Emissions Trading 2007: Preparing for Phase II, 10 July 2007, Brussels, Belgium,
Contact: Environmental Finance Conferences,
e-mail: info@enviromental-finance.com

Intersessional meeting of AWG and the 4th meeting on the 'dialogue' under the UNFCCC, 27 -31 August 2007, Vienna, Austria
Contact: Internet: http://unfccc.int

Latin American Carbon Forum, 5-7 September 2007, Lima, Peru
Contact: IETA, e-mail: info@ieta.org, Internet: http://latincarbon.com/2007

CO_2 capture and storage in the CDM, 6-7 September 2007, Dakar, Senegal & 10-11 September 2007, Gaborone, Botswana
Contact: Ms. Heleen de Coninck, ECN Policy Studies, e-mail: deconinck@ecn.nl, Internet: http://www.ccs-africa.org

Climate Changes Spatial Planning, 12-13 September 2007, The Hague, The Netherlands
Contact:
Internet: http://www.klimaatvoorruimte.nl/

Studies & Reports

Anger, N. C. Böhringer, U. Moslener, 2007. Macroeconomic Impacts of the Clean Development Mechanism: the role of investment barriers and regulations, Discussion Paper No. 07-026, ZEW Centre for European Economic Research, Manheim, and University of Oldenburg, Department of Economics, Oldenburg, Germany.
This paper quantifies the macroeconomic impacts of the CDM based on a computable general equilibrium model of international trade and energy use. Using CDM project data, the authors access the relative importance of transaction costs and investment risks as well as CDM regulations through supplementarity and criteria for additionality of projects' GHG emissions reductions.

Contact: Niels Anger, e-mail: anger@zew.de; Christoph Böhringer, christoph.boehringer@uni-oldenburg.de; Ulf Moslener, e-mail: moslener@zew.de
The report can be downloaded from: ftp://ftp.zew.de/pub/zew-docs/dp/dp07026.pdf

Cames, M, N. Anger, C. Böhringer, R.O. Harthan, and L. Schneider, 2007. Long-term Prospects of CDM and JI, Environmental Research of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, Research Report 204 41 192.
The report has been prepared by the authors on behalf of the German Federal Ministry for the Environment and in collaboration with researchers from Öko-Institute in Berlin, Germany. It discusses several aspects of the present state of play of the Kyoto mechanisms JI and the CDM and presents lessons learned, based on past experience that can be used for a future climate policy regime.

The report can be downloaded from: http://www.umweltdaten.de/publikationen/fpdf-l/3294.pdf

Davis, M., F. Sinner, D. Stowell, B. Tennbakk, Alldritt, M. Baker, S. Fankhauser, I. Johnson, and C. Stephens, 2007. Global Carbon Report 2007, IDEAcarbon and ECON.
The IDEAcarbon/ECON Global Report contains a comprehensive analysis of all aspects of the global carbon market. The September issue is the main report for 2007 and is complemented by quarterly updates published in December, March and June. For a brief description of the reports' findings and conclusions, see p.4.

Contact: Mr. Sam Fankhauser, Managing Director (Strategic Advice), IDEAcarbon, e-mail: sfankhauser@ideacarbon.com; tel.: +44 020 664 0200.

Douma, W.Th., L. Massai and M. Montini (editors), 2007. The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change, T.M.C. Asser Press, The Hague, The Netherlands, ISBN 9789067042284.
This volume contains the papers that were presented at two conferences on "The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change" organised in Sienna (Italy) in June 2006 and in The Hague (The Netherlands) in March/April of this year. The book addresses the present and future climate change policy regime and pays particular attention to the design of the future regime, notably where it concerns the position of developing countries.

Contact: Mr. Wybe Douma, T.M.C. Asser Institute, e-mail: W.T.Douma@asser.nl tel.: +31 (0)70 3420368; Internet: www.asserpress.nl/cata/Kyoto-Protocol/fra.htm

GtripleC and Ecofys, 2007. Sectoral Proposal Templates, Cologne, Germany.
These templates aim at supporting developing countries in proposing sectoral GHG emission baselines under a post-Kyoto climate regime. The sectoral approach underlying the work is seen as a means to scale-up investments in clean technology and systems in developing countries. Templates (in draft form) are available online for the sectors cement, electricity and transport.

Contact: Dr. Martina Jund, Ecofys, Cologne, Germany, tel.: +49 221 510 907 81, e-mail: m.jung@ecofys.de
The templates can be downloaded from http://www.sectoral.org

Hinostroza, M., Chia-Chin Cheng, Xianlu Zhu, and J. Fenhann, with C. Figueres and F. Avendano, 2007. Potentials and Barriers for End-use Energy Efficiency under Programmatic CDM, CD4CDM working paper series, working paper no. 3, UNEP/Risö Centre, Denmark.
This working paper addresses the implications of the recent CDM EB policy decision on CDM Programmes of Activities, which facilitates bundling of small-scale activities as one CDM programme. The paper explores how end-use energy efficiency improvement activities could become suitable under such programmes.

This report can be downloaded from http://www.cd4cdm.org

Streck, C. and T. B. Chagas, 2007. The Future of the CDM in a Post-Kyoto World, Carbon & Climate Law Review, Lexxion Berlin, Vol. 1, No.1, pp.53-63.
This article explains that the CDM's architecture is burdened by structural flaws, which must be dealt with if the CDM is to achieve its full potential. Two aspects are addressed: the limited focus on sustainable development aspects of CDM projects, and the governance architecture. The article discusses ways for international co-operation to realise sustainable development benefits and for international financial and commodity markets to pursue efficiency and transparency in regulatory procedures.

For further information about CCLR, contact: http://www.lexxion.de

The **Joint Implementation Quarterly** is an independent magazine established to exchange the latest information on the Kyoto mechanisms and emissions trading. *JIQ* is of special interest to policy makers, representatives from business, science and NGOs, and staff of international organisations involved in the operationalisation of the Kyoto mechanisms, including emissions trading.

The **eJIQ** is established as an addition to the regular *JIQ* in order to quickly respond to the latest developments in the field of the Kyoto mechanisms and emissions trading.

JIQweb Popular Downloads

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JIQ Vol. 10, No. 1	10,839
JIQ Vol. 12, No. 4	6,335

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Abbreviations

AAU	Assigned Amount Unit
AIJ	Activities Implemented Jointly under the pilot phase
Annex A	Kyoto Protocol Annex listing GHGs and sector/source categories
Annex B	Annex to the Kyoto Protocol listing the quantified emission limitation or reduction commitment per Party
Annex I Parties	Countries with a quantitative CO_2 target (OECD, Central and Eastern European Countries, listed in Annex I to the UNFCCC)
Annex II Parties	OECD countries (listed in Annex II to the UNFCCC)
non-Annex I Parties	Countries without a quantified CO_2 target (also non-Annex B)
AWG	Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol
CCS	Carbon Dioxide Capture and Storage
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction (Article 12 Kyoto Protocol)
COP	Conference of the Parties to the UNFCCC
DOE	Designated Operational Entity
DNA	Designated National Authority
ERs	Emission Reductions
ERPA	Emission Reduction Purchase Agreement
ERU	Emission Reduction Unit (Article 6 Kyoto Protocol)
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance (under the EU ETS)
GHG	Greenhouse Gas
IET	International Emissions Trading
ITL	International Transaction Log
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
KP	Kyoto Protocol
LULUCF	Land Use, Land-Use Change and Forestry
MethPanel	Methodology Panel to the CDM Executive Board
MOP	Meeting of the Parties to the Kyoto Protocol
MoU	Memorandum of Understanding
PIN	Project Information Note
PDD	Project Design Document
SBSTA	UNFCCC Subsidiary Body for Scientific and Technological Advice
SBI	UNFCCC Subsidiary Body for Implementation
UNFCCC	UN Framework Convention on Climate Change

JIQ Meeting Planner

15 October 2007, Brussels, Belgium
CDM 2.0: what post-2012 mechanisms do we need? – Meeting organised by Climate Action Network-Europe, Hivos, and Natuur & Milieu.
Contact: Mr. Matthias Duwe, CAN-Europe, 48 Rue de la Charité, 1210 Brussels, Belgium, tel.: +32 2 22 95224, fax: +32 2 2295229, e-mail: Matthias@climnet.org, Internet: http://www.climnet.org

24-26 October 2007, Montréal, Canada
Climate 2050: Technology and Policy Solutions, organised by Veolia Environment Institute (Canada), PEW Center (USA) and the National Round Table on the Environment and the Economy (Canada).
Contact: e-mail: climate2050@unisfera.org, Internet: http://www.climate2050.org

29-31 October 2007, New York City, USA
Carbon Market Insights Americas
Contact: Point Carbon, tel.: +1 202 289 3930, e-mail: conference@pointcarbon.com, Internet: http://www.pointcarbon.com

6-7 November 2007, Singapore
Carbon Forum Asia 2007
Contact: IETA, e-mail: info@ieta.org, Internet: http://www.carbonforumasia.com

14-15 November 2007, Belgrade, Serbia
Climate Change in South-Eastern European Countries: causes, impacts and solutions. Organised by UNDP, Joanneum Institute and Belgrade Chamber of Commerce.
Contact: Mr Daniel Steiner, Joanneum Institute, e-mail: climate@joanneum.at, fax: +43 316 8769 1432; Ms. Jelena Stankovic e-mail: workshop.Belgrade@gmail.com

19-21 November 2007, Groningen, the Netherlands
Energy Delta Convention 2007 (EDC2007) – the conference will focus on the growing importance of decentralised energy, gas as transition fuel and on energy transition in general
Registration: http://www.energyconvention.nl/

3-14 December 2007, Bali, Indonesia
COP 13 and COP/MOP 3
Contact: UNFCCC Secretariat, tel.: +49 228 815 1000, fax: +49 228 815 1999
e-mail: secretariat@unfccc.int, Internet: http://www.unfccc.int

24-25 January 2008, Vienna, Austria
4th Austrian JI/CDM Workshop, organised by Kommunalkredit, Austria.
Contact: Mr. Peter Kögler, p.koegler@kommunalkredit.at