



REGIONAL ASSOCIATION OF OIL AND NATURAL GAS
COMPANIES IN LATIN AMERICA AND THE CARIBBEAN

19th Upper Managers Report on Climate Change

*GHG Emissions Reductions Projects and
Carbon Markets*

Prepared by
Miguel Moyano



19th Upper Managers Report on Climate Change

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Executive Summary

The oil and gas industry sector can contribute to reduce the greenhouse gas (GHG) emissions worldwide. This ARPEL Upper Managers Report is intended for executives to understand the basic and key elements that oil and gas companies need to address to maximize the benefit of GHG emissions reductions projects by obtaining carbon credits from regional and international markets.

Since the Clean Development Mechanism (CDM) of the Kyoto Protocol is an international reference framework, this report will display how the Latin American and Caribbean oil and gas sector can put CDM into practice. Other carbon credit markets are also discussed while they can link to CDM.

Readers will learn about: the key participants –including financing institutions- project types and their preparation as well as the whole process of CDM. They will also learn how to manage the risks of these projects and those associated to managing carbon credits. Web sites where further information can be obtained are included in this report.

Some Fundamentals for this Report

- ❖ Burning fossil fuels add to greenhouse gas (GHG) emissions and global warming. **The contribution of oil and gas industry operations in Latin America and the Caribbean can be estimated in ca. 0.4% of the world total CO₂ emissions derived from fossil fuels' production and consumption.**
- ❖ The Kyoto Protocol is an international agreement signed in 1997 and linked to the United Nations Framework Convention on Climate Change (UNFCCC). It entered into force in 2005 (see http://unfccc.int/kyoto_protocol/items/2830.php for further information). In order to assist in the reduction of GHG emissions utilizing market mechanisms, the Kyoto Protocol developed –among other mechanisms- the Clean Development Mechanism (CDM). The CDM would assist developed countries to obtain credits for GHG emissions reductions obtained from projects implemented in developing countries. **Companies operating in developing countries are expected to implement GHG emissions reductions projects and the credits obtained through CDM will assist them in implementing those that would otherwise not be economically feasible as much as in accomplishing the sustainable development of the host country.**
- ❖ GHG are those gases that trap the heat from the sun into the atmosphere. There are six GHG listed under the United Nations Framework Convention on Climate Change, each with different global warming potential – GWP (written between brackets): carbon dioxide - CO₂

(1), methane - CH₄ (23), nitrous oxide - N₂O (296), hydrofluorocarbons – HFCs (140 - 12,000), perfluorocarbons – PFCs (5,000 – 12,000), and sulphur hexafluoride - SF₆ (22,200). This means that – from the GWP point of view- **reducing the emissions of one tonne of CH₄ is equivalent to reducing the emissions of 23 tonnes of CO₂ and –thus- 23 times more valuable from the carbon credits point of view.** For this reason, GHG emissions reductions are expressed in equivalents of carbon dioxide (CO₂eq).



- ❖ CDM rules and procedures have somehow impaired the oil and gas industry participation. However, following CDM, other carbon markets have been created (e.g., European Union Emissions Trading Scheme) in which this industry sector can participate; their rules and procedures resemble those of CDM, although less bureaucratic. **The global carbon markets were worth more than 40 billion Euros in 2007, up by 80% from 2006.**
- ❖ **By 2012, new rules are expected to apply internationally.**

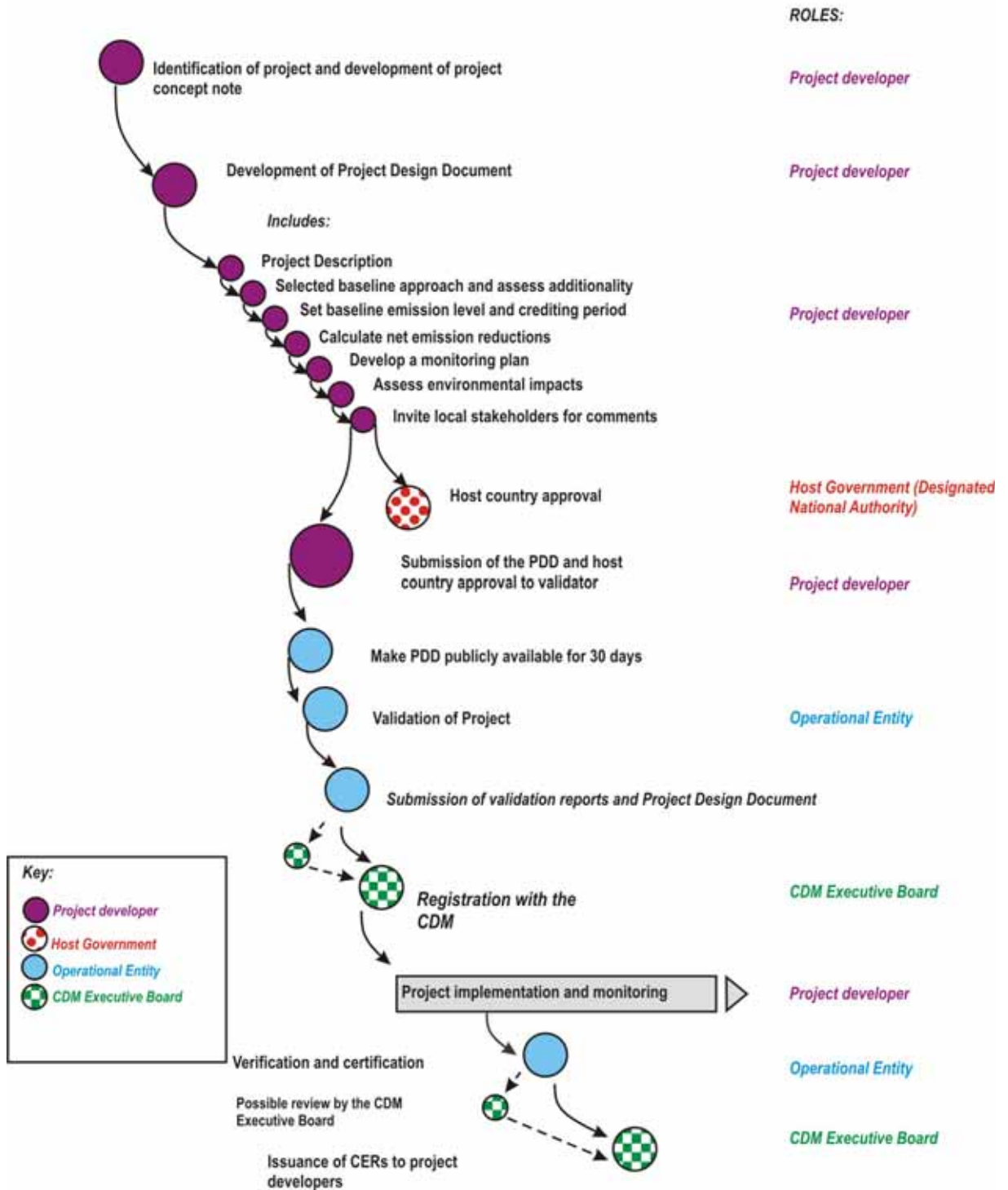
The CDM can potentially redirect the flow of investments to a variety of different GHG emissions reductions projects. To ensure that the CDM accomplishes the goals it is intended to fulfill, numerous safeguards and checks have been included in the rules of its implementation, and many participants will have a say in the process. All projects that aim to generate Certified Emission Reductions or CERs under the CDM rules must essentially meet the same criteria and complete the same steps. This process is commonly known as the CDM project cycle. Figure 1 shows the steps and key stakeholders involved in the process of obtaining credits from a CDM Project.



19th Upper Managers Report on Climate Change

January, 2009

FIGURE 1: A SIMPLIFIED CDM PROJECT FLOW



Source: www.undp.org/energy/docs/cdmchapter2.pdf



19th Upper Managers Report on Climate Change

January, 2009

CDM Participants – Who is who?

Every CDM project involves a standard set of key participants. While the range and types of stakeholders may vary from project to project, the following discussion describes the key participants with specific roles in all projects:

Project developer / operators

The following types of organizations can develop and operate CDM projects: private sector companies, governmental bodies (usually, departments of government), municipalities, foundations, financial institutions and NGOs.

CDM investors / CER purchasers

An investor is an entity that purchases CERs from a CDM project. The investor is usually from a developed country and can be a corporation, a government body or non-governmental organization. Although readers can check the different means and status of CERs issued and requested under the CDM at <http://cdm.unfccc.int/Issuance/index.html>, the links with the global marketplace for CERs is addressed later.

Host governments and designated national authorities

In order to participate in the CDM, a country needs to be a Party (signed and ratified) to the Kyoto Protocol (check http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php for status of ratification). CDM host countries also have to specify a domestic institutional body – a designated national authority or DNA – for approving CDM projects (check data of countries DNA's at <http://cdm.unfccc.int/DNA/index.html>)

The CDM Executive Board

The CDM Executive Board supervises the CDM and reports directly to the Conference of Parties to the UNFCCC / the Meeting of Parties to the Kyoto Protocol (COP/MOP). Among other responsibilities, the Executive Board is responsible for:

- ❖ approving new methodologies related to baselines, monitoring plans and project boundaries;
- ❖ accrediting and suspending of operational entities;
- ❖ issuing verified CERs; and
- ❖ reviewing project validation and verification reports;

Check <http://cdm.unfccc.int/EB/index.html> for further information on the CDM-EB.

Designated Operational Entities

Designated operational entities, or DOEs, are domestic or international legal entities that have been accredited by the CDM Executive Board. Among others, their responsibilities include:

- ❖ validation of CDM activities at the outset of the project;
- ❖ liaison between the CDM documents and other

stakeholders; and

- ❖ verification and certification of CERs during the operation of the project;

Check <http://cdm.unfccc.int/DOE/index.html> for further information on DOE.

Other Stakeholders

The CDM process cycle calls for two rounds of stakeholder comments. Developers must invite local constituencies who will be affected by a project to review and comment on the project design document before it is submitted for host country approval. Later, subsequent to project approval, the project design document must be posted for 30 days to allow interested parties at the local, national or international level to comment on it.

CDM Project Types – Examples of GHG Emissions Reductions Projects

A generic description of CDM projects that can be implemented by the oil and gas sector include:

- ❖ **Energy efficiency:** increasing commercial/industrial energy efficiency through measures such as recovery and use of flared or vented gas, closing open-cycled turbines, cogeneration, upgrading instrumentation, controls, and/or equipment. Actually there are 57 energy efficiency projects of the oil and gas industry in the pipeline, equivalent to 61 MMtCO₂eq by 2012.
- ❖ **Fuel switching:** substituting more carbon intensive fuels for less intensive fuels in industrial processes and power generation. Examples include substituting fuel oil or diesel for natural gas or LPG in boilers, heaters and turbines. Such projects can be applied to existing projects where real substitution occurs or to new projects where business-as-usual would be the use of more carbon intensive fuels. Actually there are 4 fuel switching projects of the oil and gas industry in the pipeline, equivalent to 0.6 MMtCO₂eq by 2012.
- ❖ **Renewable energy:** energy generated from sources that are naturally replenished, such as sunlight and wind, have the highest potential to displace carbon





19th Upper Managers Report on Climate Change

January, 2009

emissions from fossil fuel combustion. Actually there is 1 renewable energy project of the oil and gas industry in the pipeline, equivalent to 11 ktCO₂eq by 2012.

- ❖ **Methane recovery:** capture and utilization of fugitive gas from gas pipelines and storage tanks. Also includes methane recovery from water treatment facilities. Actually there is 1 methane recovery project of the oil and gas industry in the pipeline, equivalent to 160 ktCO₂eq by 2012.
- ❖ **Cogeneration:** the use of waste heat from electric generation, such as exhaust from gas turbines, for industrial purposes or heating. Actually there are 15 cogeneration projects of the oil and gas industry in the pipeline, equivalent to 4.6 MMtCO₂eq by 2012.
- ❖ **Carbon Capture and Storage (CCS):** although not yet approved by the CDM-EB, the potential of this technique (which involves the re-injection of CO₂ emitted from fossil-fueled power generation or from oil and gas production, into the reservoir or rock-sealed geologic structures) is enormous and being considered for qualification for CDM.

In order to prove how much CO₂eq the project will reduce and how much it is actually being reduced annually, the project must have a baseline and monitoring methodology approved by the CDM-EB (for a list of approved methodologies, check <http://cdm.unfccc.int/methodologies/index.html>).

A Roadmap to Obtaining Credits from GHG Emissions Reductions Projects

This chapter brings the reader through a logical pathway of how a company can bring an idea of a GHG emissions reductions project into a certified emissions reduction carbon credit. However, in order for companies to systematically and orderly travel through this process, it is strongly recommended they have an organizational structure in place. Each company should find the management structure that best fits its purpose, and this report is not intended to provide recipes. However, the experience says that several divisions must be involved. Operations, environment, business development, financial, legal and other departments must be strategically articulated if the structure is to be successful and sustainable.

1.- Project Identification

Once a project is identified, the company should ascertain whether the project is eligible under the CDM and will have the support of the host country. As the first step, the company can make an initial assessment as to whether the project is eligible under the CDM (see Box 2.3, Eligibility Exercise at www.undp.org/energy/docs/cdmchapter2.pdf).

2.- Project Idea Note

If the answers to the questions in the eligibility exercise were favorable, the company and/or its advisors should develop and submit a Project Idea Note, or PIN, to one or more carbon credit buyers in the marketplace to gauge a level of interest in the project. The PIN will subsequently be screened by the recipient entities against the CDM rules and their investment criteria.

Notes:

- ❖ *Development of a PIN is not a requirement of the CDM process. The PIN represents an inexpensive way to get market feedback without engaging the entire CDM process (see Box 2.4, Project Idea Note at www.undp.org/energy/docs/cdmchapter2.pdf).*
- ❖ *There are several carbon project developers worldwide that can help companies prepare the PIN or latter stages of a CDM project, as well as web sites where companies can search for investors to invest in their projects (please visit <http://www.carbonfreezone.com/ProjectDeveloper.aspx> for further information on project developers and carbon markets).*
- ❖ *At this stage, companies will need to start thinking of the financial structuring (i.e., which parties are expected to provide the project's financing and suggested CER price in US\$/tCO₂ equivalent reduced). This will become a more important issue at later stages.*

3.- The Project Design Document

The project design document, or PDD, is the key documentation in the project cycle, and completing it is complex undertaking. As illustrated in the CDM process flow chart in page 2 of this report, the PDD is submitted to a Designated Operational Entity for validation, and once validated, to the CDM Executive Board for registration.

Notes:

- ❖ *PDD is a necessity. No project can earn CERs without the development, validation and Executive Board acceptance of it. The PDD can also be a valuable sales tool for potential investors.*
- ❖ *Usually, companies entrust internationally recognized project developers at this stage. Those interested in learning the structure of PDD as well as in gaining insights on the jargon and concepts (and their definitions) handled while developing a PDD can check <http://cdm.unfccc.int/Reference/Guidclarif/pdd/index.html>.*

4.- Stakeholder Participation

For CDM projects there is a specific requirement to invite local stakeholders for comments on the PDD and address their concerns inasmuch as feasible.





19th Upper Managers Report on Climate Change

January, 2009

Notes:

- ❖ *This local stakeholders' consultation process is distinct from:*
 - o *the invitation for comments from stakeholders by the DOE, during the project validation phase, and*
 - o *the consultation process that takes part of the social-environmental impact study, should the project require it by the local authorities*

5.- Host Country Approval

CDM projects have to be approved by the host country, since it is its responsibility to confirm whether a CDM project activity will help it meet its own sustainable development criteria. Subject to further clarification from the Executive Board and COP/MOP, an official Letter of Approval from the Designated National Authority will serve as evidence of host country acceptance.

Notes:

- ❖ *Check with your DNA any guidelines or procedures for approving CDM projects as well as eligibility criteria for the CDM*

6.- Validation by the Designated Operational Entity

Once the project design document has been completed and the host country approval has been received, all documents have to be submitted to a Designated Operational Entity, or DOE, for review and approval – a process called validation. Validation is the process of evaluation of all relevant documents for a CDM project activity against the requirements for CDM.

Notes:

- ❖ *It is generally the responsibility of the project proponent to arrange for validation and to contract, and pay for, the services of a Designated Operational Entity. Though there are purchasers who will absorb these costs, it should be expected that those costs will ultimately be subtracted from the eventual CER transaction*
- ❖ *The DOE allows 30 days, from the date from which the PDD is made publicly available, for receipt of comments.*
- ❖ *The list published at the UNFCCC website (<http://cdm.unfccc.int/DOE/index.html>) does not point out if a DOE has specific qualifications. The Executive Board does not prescribe which of the DOE should be used, and this is the project developer's decision. However, experts in the field should be able to assist developers in this regard.*

7.- Registration

Registration of the project with the CDM Executive Board is the act of formal acceptance of the validated project. The

request for registration of a CDM project is the responsibility of the designed operational entity. The DOE submits the validation report and host country approval to the CDM Executive Board for registration. The registration of the project with the CDM-EB will be final after a maximum of eight weeks after validation and the submission of the project to the CDM-EB, unless a review is requested.

Notes:

- ❖ *Apart from the mandatory registration of the CDM project with the Executive Board, the host country may also require registration of the project. It is advised to check with the designated national authority in the host country for requirements regarding registration of CDM projects.*
- ❖ *For an updated analysis of registered CDM projects, we suggest the reader to check <http://www.cdmpipeline.org/>.*

8.- Implementation and Monitoring

Once the project has been registered, it can be implemented. From the point of implementation on, the project developer needs to start monitoring the project performance, according to the procedures laid out in the validated monitoring plan of the Project Design Document. The monitoring results have to be submitted to a Designated Operational Entity for verification and certification. At the very minimum, technical project performance, including the project output and the related greenhouse gas emissions has to be monitored. In addition, environmental impacts and leakage effects of the project have to be monitored.

Notes:

- ❖ *CERs can only be issued after verification of the monitored data. The frequency of monitoring does not necessarily have to be equal to the frequency of verification. Based on the monitoring results, the greenhouse gas emission reductions from the CDM project activity can be calculated and submitted for verification as CERs.*
- ❖ *CERs are based on reductions during the specific time period for which the monitoring results are provided.*

9.- Verification

The project developer is responsible for contracting a Designated Operational Entity to carry out the verification process. Verification is the periodic review and ex-post determination of the monitored greenhouse gas emission reductions that have occurred as a result of the CDM project. The verification process confirms the total number of CERs resulting from CDM projects during a specific period of time.

Notes:

- ❖ *Frequent verification (for example, every year instead of every three years) increases transaction costs, but also allows for more frequent transfer of CERs.*





19th Upper Managers Report on Climate Change

January, 2009

10.- Certification and Issuance of Credits

Certification is the written assurance by a Designated Operational Entity that during the specified time period, a project activity achieved the reductions in greenhouse gas emissions as stated and verified, in compliance with all relevant criteria. The certification report prepared by the DOE should consist in a request to the CDM Executive Board to issue the amount of emission reductions that have been verified by the DOE as CERs. When the Executive Board approves the issuance of CERs, the CDM registry administrator, working under the authority of the Executive Board, will forward the CERs into the appropriate accounts.

Notes:

- ❖ *Once the DOE has signed off, any underperformance of the CDM project with respect to the quantity or quality of the CERs is the responsibility of the DOE.*
- ❖ *For CDM projects, 2 per cent of the CERs is deducted and allocated into an Adaptation Fund established by the Kyoto Protocol.*

Risk Management – Some Key Hints

As in any project and commercial transaction, developing a GHG emissions reductions project aimed at acquiring carbon credits entails some risks. Since 1999, the ARPEL Climate Change Working Group (now Climate Change and Energy Efficiency Committee) has been closely following the CDM process from different angles: technical, financial, procedural among others. The experience gathered –both individually and collectively- by oil and gas companies in Latin America and the Caribbean has been shared through ARPEL. This chapter is aimed at highlighting some key issues that should be taken into consideration when developing a GHG emissions reductions project aimed at acquiring carbon credits in the CDM and other markets.

- ❖ **Additionality. Business as usual?** A crucial feature of an approved CDM carbon project is that it has established that the planned reductions would not occur without the additional incentive provided by emission reductions credits, a concept known as «additionality». The CDM project developer needs to

warrant the additionality of the project, a feature that is an integral part of the project approval. A discussion of the issue including a step-tool to identify additionality can be found at http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf.

- ❖ **Financing the project. Where can I get the money from?**
 - o Many project developers identify lack of access to financing as one of the key reasons why numerous CDM project concepts never materialize. At the same time, local financial intermediaries in developing countries continue to play a limited role in financing CDM projects. Lack of knowledge about CDM modalities and procedures and about approaches for financial appraisal of CDM projects are among the reasons for this lack of participation in the CDM by local banks in host countries. UNEP's Capacity Development for CDM (CD4CDM) Project has collaborated with EcoSecurities (www.ecosecurities.com), a CDM project development and consultancy firm, to produce the «Guidebook to Financing CDM Projects» (www.cd4cdm.org/Publications/FinanceCDMprojectsGuidebook.pdf) with the objective of closing the communication gap between financial intermediaries in host countries and project developers. The guidebook –edited in May 2007- will assist the reader in having a consolidated list of financing institutions and the framework under which loans can be requested. Please note that the list grows every year as the carbon market represents an opportunity for financing institutions to diversify their investment portfolios.
 - o The CDM Executive Board, at its 21st meeting (2005), in discussing work on the registration of CDM project activities and related issues as part of the CDM Management Plan, decided to «Make publicly available relevant information, submitted to it for this purpose, on proposed CDM project activities in need of funding and on investors seeking opportunities, in order to assist in arranging funding of CDM project activities, as necessary». In response to this mandate, the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat and the UNEP Risoe Centre on Energy, Climate and Sustainable Development launched the UNFCCC CDM Bazaar (<http://www.cdmbazaar.net/>). The site contains information for project developers, sellers, investors and buyers. This includes contact information, characteristics of project activities seeking funding or of interest to buyers





19th Upper Managers Report on Climate Change

January, 2009

(e.g. type, size, country, etc.), the nature of relationship e.g. buyer, technology provider, equity/debt and the project support documentation at various stages. Project Ideas can be uploaded to the UNFCCC CDM Bazaar when they are developed to the stage that they at least have the potential to become Project Ideas Notes, which are preliminary CDM feasibility studies often produced to facilitate host country approval and/or financing of a project.

- ❖ **Negotiating the Emissions Reduction Purchase Agreement (ERPA). Who gets the credits?** An ERPA is a legally binding contract which describes – among other issues- how to actually transform emissions reductions (seller) into money (paid by the buyer) and helps manage the major risks in relation to the project and the international and domestic legal systems within which it is based. A standard example of ERPA can be found at <http://www.ieta.org/ieta/www/pages/getfile.php?docID=1318>.
- ❖ **How much can I get for my credits?** Depending on several issues, the price agreed for the transaction of carbon credits varies. The seller is expected to receive a low price for non-firm volumes to be delivered; the buyer purchasing what the seller sells even if they are not certified emissions reductions (CERs). The highest price can be expected if the seller guarantees a firm volume of CERs issued by the CDM or secondary CERs from credit-rated institutions. However, most transactions of primary CERs (CERs yet to be generated and credited) are what are considered «standard off-take»; the buyer agrees to pay a fixed or indexed price (or combination of both) for a maximum amount or percentage of the CERs generated and delivered in a given period whereby failure to deliver such amounts carries no penalty or compensation.

Also, and as with any other commodities' market, there is a risk of excess supply or low demand of credits.

- o For CERs in the CDM market, it is the issue of Russia's 'hot air'. Hot air refers to the large amount of excess emission rights that Russia has accumulated. At the end of the 1990s, Russia had recorded an unintended 30 percent reduction in CO₂ emissions from the 1990 level due mostly to economic stagnation. Developed countries, with a shortage of emission rights, would have little choice except to buy 'hot air' at exorbitant prices in one-on-one negotiations with Russia.
- o Cap-and-trade systems such as the European Union Emissions Trading Scheme, allocate allowances to different industry sectors to emit GHG. An allowance is a permit to emit 1 ton of CO_{2eq}. In these systems, if there is over-allocation of allowances, the carbon credit price plummets.

- ❖ **Post Kyoto. What will happen to my credits after 2012?** The Kyoto Protocol mandates developed countries to accomplish GHG emission reductions by 5.2% between 2008 and 2012. A decision on the role the CDM might play under this new regime has not yet been agreed upon. 'Post-Kyoto risk' is therefore due to the uncertain international demand and recognition for CERs beyond 2012. Negotiations are under way at the international level to re-frame the obligations worldwide. This will have an impact on supply and demand of carbon credits and –thus- on the price of these credits. While the future of CDM and other market mechanisms is contingent upon governments reaching an agreement in November/2009 at the 15th Conference of the Parties of the Kyoto Protocol, we encourage the reader to read «*A reformed CDM – Including New Mechanisms for Sustainable Development*» (<http://www.cd4cdm.org/Publications/Perspectives/ReformedCDM.pdf>) to evaluate the opinions of different experts on the subject.
- ❖ **OK with CDM. What about the other markets?**
 - o The European Union Emissions Trading Scheme (EU-ETS) is still dominating the global carbon market. The EU-ETS saw a traded value in 2006 of 28 billion Euros.
 - o Regional voluntary markets such as the Regional Greenhouse Gas Initiative are paving the way toward a nationwide cap and trade system in the United States, which emits over 20 percent of worldwide greenhouse gas emissions. In an international market, the United States could be an important purchaser of carbon credits from Latin America.
 - o It is increasingly likely that, for the foreseeable future, instead of a single global emissions trading scheme, there will be a patchwork of schemes, as a number of mandatory and voluntary schemes are now operating or being developed around the world. Many governments involved in developing emissions trading schemes want to link their scheme with others, to achieve the benefits of a larger market. However, carbon markets are still, and will remain, politically driven markets, as supply and demand for credits are determined to a significant degree by political decisions. Furthermore, and as an example, there are still some uncertainties about the legal regimes for exchanging allowances and CERs across national borders in Europe.
- ❖ **Partnerships and project ownership.** The age of easy oil is gone. With the increasing risk of unconventional oil and gas projects, companies seek to share their risk with partners. Implementing innovative, more expensive technologies that reduce or avoid greenhouse gas emissions through partnerships can





19th Upper Managers Report on Climate Change

January, 2009

be challenging. There is a risk of not reaching consensus among the partners and delaying or canceling the project altogether. The majority owner has more weight in the decision process.

- ❖ **Project timeframe. How do I deal with bureaucracy?** When considering the undertaking of a CDM project, it is important to have realistic expectations of the time and resources required to take the project through the process. This is particularly true of projects for which a new methodology would need to be developed. There is relatively little that can be done to expedite the process but sellers do have many options to contract-out the management of the CDM process. In the forward sale of the CERs, the seller can opt for the buyer to assume responsibility and costs for the CDM process.
- ❖ **Other barriers/issues:**
 - o The increasingly growing market of brokers, consultants, buyers, multilateral financing agencies, etc., involved in the process impacts the strategies of those companies that are just starting the process. The search for free and unbiased opinions from peers participating of industry associations such as ARPEL is suggested.

- o The low capacity building and infrastructure of some companies and DNAs may impair companies' efforts to go through the CDM projects' approval process. In this case, outsourcing the endeavor to a local office of international project developers may reduce the effort that would otherwise have to be 100% responsibility of the company.
- o CDM methodologies applicable to the oil and gas sector are limited and often too specific to be applied to projects of the same type. Flare gas recovery projects often suffer from the limited scope of methodologies despite the similar nature of these projects whether they be in upstream or downstream. Three different methodologies apply to such projects, yet new or revised methodologies are being contemplated for flare gas projects with small differences.

For further insights on these and other issues related to GHG emissions reduction projects and carbon crediting, ARPEL Member Companies can benefit from the experience and information exchange by posting their concerns and/or comments in the virtual forum of the ARPEL Climate Change and Energy Efficiency Committee (ccee@arpel.org.uy). In case you need support to join this forum, please contact Irene Alfaro, ARPEL Projects Manager (irene@arpel.org.uy).

*Written by Miguel Moyano
(ARPEL- mmoyano@arpel.org.uy)
Reviewed by the ARPEL Climate Change and
Energy Efficiency Committee*