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Capacity Building for CDM in Angola

MEMBER OF THE PÖYRY GROUP

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Abbreviations

A/R	Afforestation/Reforestation
AM	Approved Methodology
APG	Associated Petroleum Gas
bcm	billion cubic meters
CD4CDM	Capacity Development for CDM
CDCF	Community Development Carbon Fund
CDM	Clean Development Mechanism
CER	Certified Emission Reduction (for CDM)
CO_2	Carbon Dioxide
COP	Conference of the Parties
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	(CDM) Executive Board
EDEL	Empresa de Electricidade de Luanda
EIA	Environmental Impact Assessment
ENE	Empresa Nacional de Electricidade
FAO	Food and Agriculture Organization (UN)
FCPF	Forestry Carbon Partnership Fund
GGFR	Global Gas Flare Reduction Partnership
GHG	Greenhouse Gas
GoA	Government of Angola
IEA	International Energy Agency
IFC	International Finance Corporation
LDC	Least Develop Countries
LFG	Land fill gas
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MDG	Millennium Development Goals
MICOA	Ministry for Coordination of Environmental Affairs
MOU	Memorandum of Agreement
MW	Mega Watt
MWh	Mega Watt hours
NAPA	National Adaptation Programmes of Action
Norad	Norwegian Agency for Development Cooperation
NFA	National Forestry Resources Assessment
NGO	Non-Governmental Organisation
PDD	Project Design Document
PIN	Project Information Note
PoA	Programme of Activities
PV	Photovoltaic
pCDM	Programmatic CDM
REDD	Reduced Emissions from Deforestation and Degradation
SAPP	South Africa Power Pool
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

The objective of this study was to identify potential CDM projects in Angola that could be supported and to assess the status of the institutional framework for CDM in Angola, and also how Norway could support the CDM process in the country. This was done through background research, followed by a series of interviews with relevant stakeholders in Angola. This report summarises the findings of the study.

Priority areas for CDM capacity building in Angola

Establishment of the DNA

The most significant barrier to adoption of the CDM in Angola is the fact that the DNA is not yet in place. Establishment of the DNA is a political/legislative process, and from interviews with relevant stakeholders this process is under way. Although no timetable was provided, it is thought that it would be technically possible to have the DNA formally established within the first half of 2009, providing the political will was in place. In our opinion, capacity building is not required at this stage for establishment of the DNA, but will be required once the DNA is established, and the conclusions below are only valid once the DNA is established.

Norway could potentially play a role in bringing establishment of the DNA forward. We would advise against making any commitment to investing in capacity building and training in Angola until the DNA has been established, or at least until strong commitment is made to establishing the DNA accompanied by a road map and timetable. However a commitment from Norway to provide the relevant funds and know-how once the DNA is in place could act as an incentive to fast track the process of establishing the agency. The Embassy in Luanda would be best placed to approach the National Focal Point, Lucas Miranda, and the Director of the Cabinet of External Exchange at the Ministry of Environment, Arsenio Machado, in order to express an interest in providing support once the DNA is established.

Operational support for the DNA

Angola has only relatively recently ratified the Kyoto Protocol, and, until very recently, there has been no Angolan involvement in any climate change negotiation. There is therefore currently very limited CDM know-how and capability within the country and for potential staff within the proposed DNA. The most pressing issues which a newly established DNA will need to address include defining precise roles of the DNA, development of Angola's sustainable development criteria with respect to CDM, defining procedures for project approval and designing a publically accessible website containing all of the DNA procedures, criteria, and forms all in one place, as well as CDM resource material.

DNA staff training

Once established, the staff of the DNA will require training on the CDM rules and procedures pertaining to DNAs. The DNA staff will also require training on how to assess projects with respect to the newly defined sustainable development criteria and procedures for project approval. In addition, for the DNA to be a resource centre, or at least an entry point, for project developers, they should be knowledgeable about

accessing international CDM resources and information, organisation that can assist with CDM project development, and the basics of the international approval, certification and credit issuance process.

In order to reinforce the training provided above, the DNA staff would strongly benefit from working with project developers on concrete CDM project proposals. This would allow them to apply much of the "theoretical" lessons that they have been taught to real projects, and to appreciate the barriers which project developers face in preparing CDM projects.

Energy sector – calculation of the grid emission factor

Technical assistance and training is required for newly established DNA staff, in cooperation with relevant staff from the Ministry of Energy and from the state electricity generation and distribution companies (ENE and EDEL) to determine the emission factors for the separate grids, and for potential off grid developments. If these emission factors are found to be more significant for certain parts of the grid, focus could then be placed on using the CDM to attract private investment. As this is usually time consuming exercise, having the grid emission factor already determine and approved will facilitate the process for potential projects developers, and is therefore expected to encourage them to invest in CDM project development.

Energy sector – integration of CDM into development strategy

There is already awareness, specifically in the Ministry of Energy, that CDM can provide required revenues for development of the hydro power sector in Angola, in particular the small-scale hydropower sector, and potentially other renewable energy projects. However, there is limited appreciation of how to integrate the CDM into any long term strategy for development of the sector, and more specifically how to use the CDM to attract foreign investment in the sector. A review is needed of the "Programme for development of small hydro electric plants" to determine the potential for CDM to attract carbon revenues for implementation of the small scale hydro power plants, to what extent the CDM can be integrated into the Programme and how it can be used to attract investment into the sector. The outcome of the grid emission factor calculation presented above will also influence this review.

Oil & gas sector

The oil and gas sector in Angola is the one sector where capacity building has already been undertaken, and where there is an awareness of the CDM. However, due to the delays in establishment of the DNA, developments to reduce flaring of gas have gone ahead independent of the CDM. This includes the Angola LNG project and the pressure from the Angolan government on oil companies to reduce flaring and re-inject associated gas into the oil reservoirs for future use. These developments serve as a barrier to the use of CDM for reduction of gas flaring, as it becomes difficult to argue additionality for any gas flaring projects already planned and approved as part of the development of the LNG plant. However, following completion of the Angola LNG project in 2012, it is estimated that 1 bcm of associated gas will still be flared in Angola, mainly in marginal, small and/or mature fields where there are no economically viable alternatives to flaring.

Soon after the DNA has been established, Norway should initiate a dialogue with the relevant stakeholders at state and private company level to determine how the CDM can be integrated into current programmes and plans (where additionality is not compromised) and to determine the real potential for use of the CDM to further reduce associated gas flaring.

Other sectors

A project identification and development programme is required once the DNA is set up to raise awareness of the CDM and identify private and public sector organisations who may have potential CDM projects in the pipeline. Potential CDM projects would be expected in the industrial sector, the transport sector and the agricultural sector. These capacity building/project development programmes have been taken in many parts of Africa, and the experience from these should be reviewed in order to determine what would be successful in Angola.

Forestry - Capacity building of relevant staff

Given the significant forestry coverage, and the equally significant rate of deforestation[1] in the country, forestry is an area which holds significant potential for carbon reductions. But, as admitted by the Director of the Forestry Development Institute there is no know-how or competent experts in Angola to promote and effectively utilize the CDM in any national projects.

Development of A/R CDM projects

Many companies were said to be interested in exploiting Angola's forest resources, but not many were known to be interested in A/R CDM. However, there is a basis to start a dialogue with the private sector, and again, once the DNA is established, a CDM awareness raising and project development programme could be initiated.

Programmatic CDM

The newly approved "CDM Programme of Activities" (PoA) process has been developed by the UNFCCC to respond to the challenge of using CDM to promote investments in renewable energy and energy efficiency where individual installations and sites are too small to be viable as CDM. Potential PoA projects in Angola include:

- Installation of pico and micro-hydro plants: the Ministry of Energy plans to install 10 – 15 of these units in the near future, at a cost of USD 8 million;
- Solar PV programmes for rural electrification;
- Improved cookstoves;
- Installation of small scale biogas units;
- Community based biofuel projects (based on jatropha).

The PoA process is a relatively new one, and training would be required in developing the relevant projects. Probably the best target organization for developing a first PoA

[1] Tomás Caetano, General Director , Forestry Development Institute

project in Angola would be the Ministry of Energy, who have concrete plans to implement the relevant pico and micro hydro projects.

Recommendations

The following concrete recommendations are made for interventions from Norway to promote CDM in Angola, in order of priority:

1. Norway should make a commitment to provide the relevant funds and know-how once the Angolan DNA is in, and communicate this commitment to the relevant authorities (National Focal Point and the Cabinet of External Exchange at the Ministry of Environment) as an incentive to fast track the process of establishing the agency. Norway could, in addition, support this incentive by establishing a dialogue with the relevant agencies in Angola through a local expert.

Once the DNA is established:

2. Provide operational support and training of the agency's staff, including for determination of the grid emission factor in Angola;
3. Undertake a project identification and development programme open to all sectors of the economy;
4. Possibly as part of item 3 above, initiate a dialogue with the relevant stakeholders in the oil and gas sector to determine how the CDM can be integrated into current programmes and plans and to determine the real potential for use of the CDM to further reduce associated gas flaring;
5. Possibly as part of item 3 above, provide technical assistance to the energy sector on integration of CDM into development strategy;
6. Deliver a capacity building programme for the forestry sector, aimed at both relevant government staff (from the Forestry Development Institute) and relevant private sector companies;
7. Undertake a project identification and development programme targeted at potential PoA projects.

1 Background

1.1 Objective and outputs

The primary objective of this project was to map existing CDM capabilities in Angola, identify areas where gaps in knowledge exist and provide a list of potential capacity building initiatives that could assist in closing these gaps.

The outputs from this project should be a clear path forward for targeting needed assistance that will result in tangible results: a functioning CDM infrastructure and projects that are eligible under the CDM. In short, this project was a first step from Norway in providing Angola with a solid foundation for actively participating in the carbon market. In addition, the project resulted in a list of potential CDM projects in Angola.

1.2 Methodology and team

The field mission was undertaken from 10th to 12th February 2009. The field visit to Angola was carried out by Francois Sammut from Econ Pöyry, with Maja Tofteng providing support in Norway. During the mission, the consultant was accompanied by Leif Tore Trædal from Norad. The Inputs and assistance from the Norwegian Embassy in Luanda were provided by Lars Ekman, Thorstein Wangen and Lise Stensrud.

The methodology used is described in the table below:

Ref.	Task	Output
1	Desk study and field work preparation	List of project developers, officials, and other experts to be consulted, scheduling visits when possible. Outline of areas to be addressed in field visit. Preliminary assessment of CDM capacity in each country based on review of publicly available and assessable information.
2	Field visit/interviews	Descriptive presentation of the current CDM framework and available information on potential CDM projects, identification of potential areas for support.
3	Report	Presentation of main findings, conclusions and recommendations, including specific proposals to assist countries in strengthening institutional framework for CDM facilitation.

1.3 Document review

The team first reviewed the status of CDM in Angola, through published reports and proceedings from workshops. In reality, limited information is available on this issue in Angola, and no PINs or project PDDs have yet been prepared. Focus was therefore placed on identifying the relevant stakeholders to meet during the field visit.

1.4 Interviews during mission

During the mission to Luanda, an introductory meeting with the Focal Point based at the Ministry of Environment, followed by meetings with relevant experts in the field in Angola, the Norwegian Embassy in Luanda and representatives from other ministries and public- and private sector stakeholders. The parties were interviewed about the status of CDM development in the country, their initiatives, projects and policies. The summary of these discussions is presented in Section 5.

2 Previous CDM capacity building programmes

Climate change and environment has not been high on the political or civil society agenda in Angola in recent years. This is in large parts attributed to the post-conflict situation, limited institutional capacity and focus on reconstruction and development. Angola signed the climate change convention in June 1992, which was ratified in May 2000 and entered into force in August of the same year. However, Angola only ratified the Kyoto Protocol in May 2007, which entered into force in august of that year. Angola is therefore a relative latecomer to the international climate change community, which is reflected in the limited amount of capacity building which has been undertaken in the country.

2.1 GGFR seminar on implementation of the Kyoto Protocol

The World Bank-led Global Gas Flaring Reduction Partnership (GGFR) held a workshop in October 2006 on implementation of the Kyoto Protocol in Angola, and opportunities for carbon financing of CDM projects.

The workshop's main objective was to support the Government of Angola (GoA) move forward toward ratifying the Kyoto Protocol and to start technical assistance related to the Clean Development Mechanism (CDM). This capacity building activity included a half day high level meeting chaired by the Prime Minister of Angola, and a two day technical workshop, opened by the Ministry of Urbanism and Environment an aimed at government and companies staff. As the GGFR is a public-private partnership aimed at overcoming the barriers to reducing gas flaring, the focus of the workshop was very much on use of the CDM to implement gas flare reduction projects in Angola. Related to this exercise, GGFR commissioned the preparation of a draft PDD for the registration of the Angola LNG project as a CDM project, although this PDD was never submitted for validation.

The workshop was well attended by local oil companies and in particular by representatives from Angolan Ministries. A list of participants is available on the GGFR website[2]. The focus, however, was very much on the oil and gas sector, which is reflected by the lack of participants from other sectors of industry and the economy.

[2] http://siteresources.worldbank.org/INTGGFR/Resources/578035-1164215415623/3188029-1164828496001/angolacdmworkshopparticipants.pdf

2.2 Regional capacity building programmes in Africa

There has been a distinct lack of engagement from the main CDM capacity building initiatives for Africa with respect to Angola. For example, the Nairobi Framework was initiated by UNDP, UNEP, World Bank Group, African Development Bank, and the Secretariat of the UNFCCC with the specific target of helping developing countries, especially those in sub-Sahara Africa, to improve their level of participation in the CDM. The initiative has neither undertaken, nor is it planning to undertake any capacity building programme in Angola.

Another example is the six-country CDM capacity development project launched in October 2007, which is jointly run by the UNDP and UN Environment Programme, and managed by a UNDP Regional Project Coordinator based in Addis Ababa, Ethiopia. The project covers Ethiopia, Kenya, Mauritius, Mozambique, Tanzania and Zambia, but not Angola.

Finally, the CD4CDM project has been very active in capacity building for CDM in sub-Saharan Africa, having undertaken programmes in Cote d'Ivoire, Mozambique and Uganda, and more recently in Mauritius and Tanzania, but the project has been absent from Angola. However, recent conversations with UNEP-Risøe have indicated that Angola could be a target country for a capacity building programme in the near future, although no preparatory work has yet been undertaken3.

[3] Interview with Glenn Hodes, UNEP-Risøe, February 2009

3 Current donor CDM capacity building programmes

Although no CDM capacity building programmes are currently running in Angola, a number of initiatives related to the countries ratification of the Kyoto Protocol in 2007 are being funded by the GoA and donor agencies. These include:

Preparation of the "National Adaptation Programmes of Action" (NAPA)

The NAPAs provide a process for Least Develop Countries (LDCs) to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. The steps for the preparation of the NAPAs include synthesis of available information, participatory assessment of vulnerability to current climate variability and extreme events and of areas where risks would increase due to climate change, identification of key adaptation measures as well as criteria for prioritizing activities, and selection of a prioritized short list of activities. The development of a NAPA also includes short profiles of projects and/or activities intended to address urgent and immediate adaptation needs of LDC Parties. Upon completion, the NAPA is submitted to the UNFCCC secretariat, where it is posted on the website, and the LDC Party becomes eligible to apply for funding for implementation of the NAPA under the LDC Fund.

Preparation of the NAPA for Angola is currently on-going, with the financial support of UNEP. The NAPA for Angola is expected to be completed by the end of 2009.

Preparation of the "First National Communication"

Parties to the Convention must submit national reports on implementation of the Convention to the Conference of the Parties (COP). The required contents of national communications and the timetable for their submission are different for Annex I and non-Annex I Parties, but the core elements for both Annex I and non-Annex I Parties are information on emissions and removals of greenhouse gases (GHGs), including a GHG inventory, and details of the activities a Party has undertaken to implement the Convention. National communications usually contain information on national circumstances, vulnerability assessment, financial resources and transfer of technology, and education, training and public awareness. Each non-Annex I Party shall submit its initial national communication within three years of the entry into force of the Convention for that Party (august 2010 for Angola). Preparation of the First National Communication is also being supported by contributions from UNEP, and is expected to be ready by the end of 2010 (including the GHG inventory).

National Forestry Resources Assessment (NFA)

This project on National Forestry Resources Assessment (NFA) is supported by the FAO and provides technical assistance and specialised equipment to undertake a forestry resources assessment programme. The agreement for the project was signed in June 2008, and the project is expected to last 24 months. The total budget of the project is defined at USD 963,370, with FAO providing USD 394 000 to support the project, with the remaining financing coming from the GoA.

The first set of seminars on "Identification of information needs" and "Methodology development" for the National Forest Assessment in Angola were held in October 2008 in Luanda.

4 Status of the DNA and supporting institutions

4.1 Institutional location, staff and management

There is currently no Designated National Authority (DNA) established in Angola. The National Focal Point is Mr Lucas Marcolino Miranda, who is attached to the Ministry of Environment.

Although the DNA has not yet been established, a "National Strategy for Implementation of the United Nations Convention on Climate change and on the Kyoto Protocol" was prepared by the focal point in September 2007. This presents a five-pronged climate change strategy which provides the basis for Angola's strategy with respect to the Kyoto Protocol and CDM. In addition to the preparation of the first national communication to UNFCCC and the NAPA as already mentioned, the strategy also includes preparation of a national action plan, establishment of a DNA and establishment of a national carbon fund.

With respect to the establishment of the DNA the strategy makes the following recommendations:

- Develop an institutional structure to ensure the functions of the DNA. The structure must be coordinated by the Ministry of Environment, and supported by the government bodies responsible for sectors of Oil, Industry, Geology and Mining, Transport, Energy, Posts and Telecommunications, Finance and Planning and Economy;
- Build capacity in the various stakeholders on the methodology, the definition of objectives and the development of the CDM projects;
- Identify key sectors and opportunities for specific projects within the framework of the CDM;

The strategy recommends that the government institution responsible for securing the implementation of these actions is the Ministry for the Environment in partnership with the Ministry of Finance and Planning.

The strategy has been accepted by the Minister of Environment, but one of the main barriers to establishment of the DNA appears to be the issue of where the Agency will sit. Two alternatives are currently under review:

- The Agency is attached to the Ministry of Environment, as recommended in the Strategy;
- The Agency is attached to the Prime Ministers Office.

A decision on the above was expected by the end of 2008, but the elections and new government which was formed in October 2008 has led to significant reorganisation at ministerial level, delays and re-evaluations of proposed strategies.

During meetings with the focal point, it was not possible to get any precise indication on when a final decision will be made on establishment of the DNA and when the latter could be expected to be operating. However, given the status of preparation of the necessary strategy and documentation, it would be technically possible to have the DNA formally established within the first half of 2009, providing the political will was in place.

Despite the relative slowness in establishment of the DNA, the Government has recently taken steps which indicate a more proactive focus on environment and climate change, manifested through the President's speech in the UN General Assembly, ratification of Kyoto Protocol, active participation at the Bali meeting, and speeches from the Minister for Environment at Poznan. In addition, the Ministry of Environment organised a top level seminar in January 2009 aimed at defining the forms and instruments to implement the Kyoto Protocol in Angola.

4.2 Regulation

There is currently no regulation related to establishment of the DNA. However, it is understood that lawyers have been engaged to review the rules and regulations related to establishment of the DNA in Angola[4]. However, it is expected that this process cannot be completed until it is decided where the DNA is to sit.

4.3 Procedures for project approval

Procedures for CDM project approval differ from country to country, but often incorporate the following phases:

- Presentation of a PIN to the DNA for pre-screening (maybe optional);
- Issuance of a Letter of Endorsement by the DNA;
- Presentation of the PDD to the DNA for final review and approval;
- Review by DNA, Technical Advisory Group or similar, with emphasis on the project meeting the country's sustainable development criteria;
- Recommendation to the relevant Minister;
- Decision by the Minister;
- Final approval/rejection letter.

In Angola, no procedures for project approval have yet been defined.

[4] Interview with Lucas Miranda, Focal Point, 10.02.09

4.4 Sustainable development criteria

Each country will need to develop its own sustainable development criteria against which to assess proposed CDM projects. In general, in order to meet sustainability criteria, CDM projects need to:

- contribute to the UNFCCC objective of stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system;
- lead to the transfer of environmentally safe and sound technology and know-how;
- contribute to the conservation of biological diversity and sustainable use of natural resources;
- comply with all other pertinent laws and regulations;
- provide measures to alleviate poverty.

No sustainable development criteria for Angola have yet been defined.

4.5 Organisations with CDM capabilities

For the reasons stated above, there are no organisations in Angola with effective CDM capabilities, know-how and experience. Of the parties interviewed, the focal point has obviously the most capabilities and know-how with respect to CDM, but no concrete experience of the mechanism. Outside the focal point, Vladimir Russo, who works as a consultant for the Ministry of Environment on climate change issues, is considered to have the most know-how on the subject, but again has no concrete experience of CDM.

Most of the stakeholders interviewed have an awareness of what the CDM is and the potential for CDM to facilitate implementation of projects in their sector. In particular, Tomás Caetano, Director General of the Forestry Development Institute, was very aware of the potential for the CDM to promote Afforestation/Reforestation in the country. Discussions with the Ministry of Energy also confirmed that there is good awareness of the potential for use of the CDM to provide carbon revenue for renewable energy projects, in particular hydropower projects.

Awareness of the CDM within the NGO sector is considered to be limited, with only a few organisations seemingly being aware of the mechanism and its possible potential for their activities. This is maybe not surprising given the lack of an established DNA, meaning that NGOs have so far not been able to access the mechanism. Also, much of the work of NGOs in recent years has, quite rightly, been focused on rebuilding the country after the ceasefire – mainly projects on peace building, land tenure, resettlement and demobilisation and housing of former soldiers. The NGOs, however, represent a potentially important source of CDM projects, specifically programmatic CDM projects. Two NGOs in particular were identified as potential partners in development of CDM, and particularly pCDM projects:

1. ADRA - Acção Para O Desenvolvimento Rural E Ambiental (Action for Rural Development and Environment): Founded in 1990. Its main objective is the empowerment of rural communities and their greater integration in the life of the country.
2. Development Workshop (DW) first came to Angola in 1981 to assist in developing policies and programmes for human settlements and self-help housing. DW's main focus is on human settlements, shelter, peri-urban upgrading, water supply and sanitation, microfinance and small enterprise development, peace building, governance and disaster mitigation. This NGO does, however, have some experience relevant to CDM in Angola, including work on cookstoves and household fuels, demostration projects on micro-hydro and agro-forestry and community based biofuels.

5 Summary of CDM project concepts

5.1 Registered CDM projects

As Angola has only relatively recently ratified the Kyoto Protocol, and as the DNA has not been established, no CDM projects have been registered in the country.

5.2 CDM project pipeline

For the same reasons as stated above, there are currently no CDM projects in any "official" CDM project pipeline[5]. This is not surprising, as potential project developers will be reluctant to invest in CDM project development until the DNA is established.

Although there is no existing project pipeline, the field visit confirmed that a number of opportunities exist within certain sectors in Angola. The ones which show the most potential for CDM are presented below.

Energy sector

The electricity sector is operated the public utility in charge of electricity generation and transmission, Empresa Nacional de Electricidade (ENE), which supplies most of the country excepting Luanda, where distribution is the responsibility of EDEL (Empresa de Electricidade de Luanda). Three separate electrical systems are used to supply electricity in Angola, mainly to major towns in each province. The Northern System supplies the provinces of Luanda, Bengo, Kuanza-Norte, Malange and Kuanza-Sul. The Central System provides for the provinces of Benguela, Huambo and parts of Bie. The Southern System supplies to Huila and Namibe provinces. Although main population centres are connected to the grid, huge parts of the country do not have access to the electricity grids. The government aims to link the systems there to create a national grid through the South Africa Power Pool (SAPP). Approximately 23% of Angola's population has access to electric power, although this is an increase from the 15% figure quoted for earlier in the decade. However, the level of access to electricity is much greater in Luanda than in other parts of the country, with the capital accounting for approximately 80% of all those with access to grid based electricity.

[5] http://cdmpipeline.org/publications/CDMpipeline.xls

Hydroelectric facilities generate around two-thirds of Angola's electricity. The Matala dam, which began operations in 2001 on the Cunene River, is the main source of electricity in southwest Angola. The Cambambe dam (180 MW) and Capanda dam (520 MW, fully commissioned in 2007), both on the Kwanza River, the Mabubas dam (17.8 MW) on the Dande River, and diesel generators are the main sources of electricity in northern Angola. In northeastern Angola, the Russian-based Alrosa Vneshtroy LDA recently completed the Chicapa hydroelectric dam (16 MW capacity) on the Tchicapa River, which began operations in August 2008.

Angola has an ambitious programme of rehabilitation of existing, and often non-operational, hydro power plants and of construction of new hydro power capacity. The Ministry of Energy and Water has recently prepared a "Programme for development of small hydro electric plants" which is a proposal to undertake feasibility studies, technical-economic viability studies and project implementation for hydro power plants with a capacity less than 10 MW. The programme has been approved by the government, and foresees construction of approximately 50 small and mini hydropower plants in the short term (up to 2013), with a combined capacity of 95 MW. The investment costs for this phase of development is estimated at a total of approximately USD 900 million (USD 765 million for hydropower plants, USD 135 million for transmission and distribution). In addition to the small and mini hydropower plants, installation of 10 to 15 micro and pico hydropower plants are also planned, at an estimated cost of USD 8 million. The programme foresees that the state will finance 60% of total investment costs (approx. USD 120 million per year), whereas the private sector will finance the remaining 40%. The programme is expected to benefit more than 4.4 million inhabitants in 15 provinces, and lead to the creation of 7 000 temporary and permanent jobs.

The energy sector, and the on-going rehabilitation and planned capacity increase present a potentially significant opportunity for carbon financing through the CDM. Two potential barriers exist, however, which may affect the potential for CDM:

- The grid emission factor
- The additionality of the projects

As approximately 67 % of generated electricity comes from hydroelectric plants, whilst only 33 % comes from conventional thermal sources such as diesel generators, it could be expected that the grid emission factor for Angola is low. Based on previous experience, it could be expected that an emission factor as low as 0.2 – 0.3 tCO2/MWh would be applicable to at least some of the Angolan grid. This would obviously have an impact on the viability of developing CDM projects. This is compounded by the fact that significant new hydropower capacity has recently been put on line (Chicapa hydroelectric dam), and that work is on-going on rehabilitation of other plants. However, it is also clear that diesel generators are also being installed at an increasingly faster rate, both by the generator and by private individuals, in order to meet demand at a relatively low capital cost and rapid installation time. It should also be highlighted that three separate electrical systems are used to supply electricity throughout Angola, and that the generation mix for these three separate grids differs significantly, which would also lead to potentially significant differences in the grid emission factors. Hydropower and diesel generators are the main

source of electricity for Northern Angola, which includes Luanda. Both the Central and Southern grid are more dependent on hydropower. However, there is also significant and increasing dependence on connecting diesel generators to these grids, as evidenced by the recent announcement that ENE will be installing a further 8 diesel generators in Lubango (Southern grid) in addition to the existing 30 units[6]. It is therefore possible that a much higher emission factor could be applicable to the separate grids, in particular the Northern grid, if it can be argues that diesel generators are currently the preferred option to increase installed electricity capacity. For reference purposes, this is the situation in Uganda, which has a similar generation mix to Angola (approx. 70% hydro), and has led to an emission factor of 0.66 tCO_2/MWh being calculated for the national grid[7].

The issue of additionality is related to the status of implementation of the various hydropower projects. For projects which have reached financial closure or are currently in implementation, which is understood to be the case for a number of the hydropower rehabilitation projects, it would be difficult to argue additionality. However, for the small scale plants mentioned in the "Programme for development of small hydro electric plants", additionally would be easier to argue as these projects are some way to being financed and implemented. However, if some of these small hydro power projects start to be implemented without reference to the CDM, it will become more difficult to argue that this option is not business as usual.

In addition to the hydro power sector, opportunities for other renewable energy options have also been identified and studied. In particular in the south of the country where hydropower resources are more limited, studies have been undertaken to identify the potential for both wind and solar power plants. These include a 4 MW wind plant and a 3 MW solar plant in Tombua, with further solar plants being installed in Namibe and Benguela. A wind mapping study is also planned for the country.

Oil and gas sector

The economy of Angola is dominated by oil production and its supporting activities which contribute about 50% of GDP, and the sector accounts for over 95% of the country's exports[8]. Angola has proven oil reserves of 9 billion barrels as of January 2008, with the majority of the reserves located in the country's offshore blocks. Angola became a member of OPEC in late 2006 and in late 2007 was assigned a production quota of 1.9 million barrels a day, somewhat less than the 2-2.5 million bbl Angola's government had wanted. In March 2008, Angola was considered by IEA to be the third largest oil producer in Africa behind Nigeria and Libya and is expected to have significant oil production increases in the short-term as new offshore projects come online. Angola exports more than 90% of its crude oil primarily to China and the US.

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6 Journal de Angola, as reported by Lars Ekman 20.02.2009

7 Bugoye 13 MW hydropower project, http://cdm.unfccc.int/Projects/Validation/DB/QSITHCKNSOSGOGKJF8O50FVCGW0KUR/view.html

8 Lars Ekman, Norwegian Embassy in Luanda

According to the Global Gas Flaring Reduction Partnership (GGFR), in 2007 Angola ranked 8th in the world with respect to estimated flared gas volumes, with 3.5 billion cubic meters (bcm) being flared during that year. As seen from table 1, this figure, however, represents a significant reduction from previous years. Angola is a partner country of the GGFR, which illustrates a wish to reduce flaring in the country.

One of the major developments related to associated gas flaring in Angola is the Liquefied Natural Gas (LNG) train to be located in the Zaire province (near the city of Soyo). The plant will have:

- Nominal LNG capacity of 5.2 million tonnes/year (6.8 bcm/year).
- Storage for LNG, Liquefied Petroleum Gas (LPG) and condensate.
- Loading jetty to accommodate 145,000 - 205,000 cubic meter LNG ships.

Table 5.1 Estimated flared volumes from satellite data

Estimated flared volumes from satellite data

Volumes in bcm	2005	2006	2007	Change from 2006 to 2007
Russia	55.2	48.8	50.0	1.2
Nigeria	21.3	19.3	16.8	(2.5)
Iran	11.3	12.1	10.6	(1.5)
Iraq	7.1	7.4	7.0	(0.5)
Kazakhstan	5.8	6.0	5.3	(0.7)
Algeria	5.2	6.2	5.2	(1.0)
Libya	4.4	4.3	3.7	(0.6)
Angola	4.6	4.0	3.5	(0.5)
Saudi Arabia	3.0	3.3	3.4	0.0
Qatar	2.7	2.8	2.9	0.2
China	2.8	2.8	2.5	(0.4)
Indonesia	2.7	3.0	2.4	(0.6)
Kuwait	2.5	2.5	2.1	(0.4)
Venezuela	2.1	2.0	2.1	0.1
Uzbekistan	2.5	2.8	2.0	(0.8)
USA	2.0	1.9	1.9	(0.0)
Oman	2.5	2.2	1.9	(0.3)
Mexico	0.9	1.2	1.7	0.6
Malaysia	1.7	1.8	1.7	(0.1)
Gabon	2.2	1.9	1.6	(0.4)
Total top 20	142	136	128	(8)
Rest of the world	20	21	19	(1)
Global flaring level	162	157	147	(10)

Red=Partner countries

The first LNG from the project is expected by early 2012, to be delivered to the US & Atlantic markets. The project is also expected to lay the foundation for natural gas-based industrial development by providing 125 million standard cubic feet per day (2.1 million cubic meter per day) of gas for domestic use. The primary source of supply for the LNG plant during the early years of operation will be Associated Petroleum Gas (APG).

In 2005, the Global Gas Flaring Reduction partnership (GGFR) commissioned a draft PDD for the Angola LNG that concluded that the diversion of flared APG streams to the LNG plant from the offshore Blocks of the participating companies would potentially save many millions tonnes of GHG emissions. The baseline for this PDD was based on the premise that the project would utilize associated gas that would otherwise have been flared.

In 2006, Chevron Angola commissioned a report from URS on the potential for CDM for the Angola LNG project[9]. This report concluded that the basic premise for the baseline used in the GGFR draft PDD could not be supported, and that the oil companies operating the new fields stated categorically that development of these offshore areas would, as a matter of their respective corporate policies, be accomplished without routine flaring, whether or not the Angola LNG project goes forward. This is in part due to the Government of Angola's successful drive to reduce gas flaring, and introduction of a range of legal and regulatory requirements for operators in the oil and gas sector in Angola. The most recent is the Petroleum Law of 12 November 2004. Article 73 of the 2004 Petroleum Law states that "exploitation of the natural gas produced in any oil deposit is obligatory and burning it is expressly prohibited" although "in the case of marginal or small size deposits the Ministry may authorize the burning of associated gas to make its exploitation viable".

The report concluded that there were significant challenges faced in getting the Angola LNG project, or parts of it, registered as a CDM project, and the probability of successful registration may not be high, but that further pursuit of CDM registration could still be warranted if the potential exists for substantial emission reductions due to the project. However, for the Angola LNG project to be a viable option under the CDM framework, the following requirements and challenges were highlighted:

- A new baseline methodology would need to be developed and submitted for approval to the CDM Methodology Panel. A careful evaluation of the most defensible baseline scenario would need to be made, which may need to incorporate differences in production operation and the maturity of the fields in the various participating Blocks;
- Certainty about when flaring (or recycling) would start and associated APG volumes for each of the production operations in the absence of the Angola LNG project would probably require reservoir modeling and engineering estimates to justify the figures presented in the project design document;

[9] CDM eligibility for the Angola Liquefied Natural Gas (LNG) project, URS, December 2006 (confidential)

- A preliminary analysis of the potential emission reductions that would result from the Angola LNG project's effect on reducing associated gas re-injection volumes and associated energy expenditures in the Blocks indicates that this may *not* result in a significant overall emission reduction compared with the baseline condition in which essentially all produced gas would be re-injected. While a more detailed analysis might show the potential for a small emission reduction, it is doubtful whether this would be large enough to justify the substantial effort required to make such a demonstration and to overcome the other difficult aspects of project registration summarized in this report;
- Angolan government ratification of the Kyoto Protocol and establishment of the Designated National Authority in Angola (this latter point has now been partially resolved).

Although this report was published in 2006, the majority of assumptions remain valid today. However there have been some significant changes to the two methodologies reviewed which might make them more applicable to this project, and therefore there may no longer be a need for development of a new methodology. The need for reservoir modeling to determine the baseline, and the uncertainty as to whether the baseline is flaring of associated gas, still remains.

It should be noted, however, that construction of the LNG plant will not completely eliminate flaring of associated gas, and it is expected that 1 bcm/yr of gas will continue to be flared once the LNG plant comes on line10. This is mainly due to a number of fields which are not planned to be connected to the Angola LNG plant (e.g. Block 2), and where the maturity of the fields means there are no viable alternatives to flaring. As oil fields mature and associated gas production declines, non-associated gas (NAG) from previously discovered gas fields will feed the plant. Flaring could still be undertaken despite the practice being banned by the 2004 Petroleum Law for two reasons. The first is that dispensation from the law is given to specific fields where recovering the associated gas would impact the viability of the activity (as stated in the law). The second reason for continued flaring is that although a law is in place, it is not enforced and common practice is to ignore the law. In both these cases, a CDM project for reduction of gas flaring could still be considered to be additional.

Historically, associated gas flaring has been carried out at the older oil fields closer to shore, where permanent rigs are installed. For the fields further out to sea, the oil is recovered from Floating Production, Storage and Offloading (FPSO) vessels. These vessels recover the crude oil and associated gas, and the latter, which officially belongs to the Angolan government, is re-injected back into the oil reservoir. This practice facilitates oil recovery, but also stores the associated gas in the depleted oil wells, which can be recovered at a later date, when the LNG plant will come on line. There is therefore minimal gas flaring at the FPSO's, as flaring is only occasionally carried out for safety reasons.

[10] Interview with Jose de Oliveira, Luanda, 11.02.09

Given the significant volumes of associated gas that are still expected to be flared in Angola, the oil and gas sector would appear to be a candidate for carbon financing through the CDM. However, a number of issues may have an impact on the potential for CDM to be used in this sector in Angola. These are:

- The Angola LNG project faces significant challenges with regards eligibility of CDM. The plant has planned on the basis that recovery of associated gas and production of LNG is a viable option, which would make it difficult to argue additionality;
- Associated gas flaring is mainly connected to the older fixed platform fields, many of which have peaked or are expected to peak between 2007 and 2011. The time frame for making viable investments, even with CDM, could therefore be limited.

Forestry sector

Angola's forest resources are abundant, well distributed across the country, and have high potential to supply sufficient quantities for internal consumption as well as export. The estimated harvestable area is approximately 40 percent of the country's 53 million ha of forest area (45 % of Angola's total surface).

The absence of a national forest inventory hampers the availability of precise information, but the average growth rate of commercial timber is estimated at 0.3 m3/ha/year. Annual allowable cut is estimated at 326.000 m3 of logs, and figures for deforestation rate differ from 0.2 % to 0.4% per year. Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland area minus net plantation expansion) for the 1990-2005 interval, Angola lost 3.1% of its forest and woodland habitat[11]. However, in some regions, in particular Huambo, Huila and Bié, deforestation is estimated to have reached rates of 15%[12], mainly as a result of the displacement of people during the civil war and their need for firewood[13].

Responsibility for Forestry at Government level lies within the Forestry Development Institute, which is part of the Ministry of Agriculture. In the past 6 years there have been significant developments in government strategy related to forestry, specifically with the support of the FAO. This has included the development of laws on forestry, wildlife and national parks. Angola is now embarking on undertaking a national forest inventory, financed in part by the GoA, with the support of the FAO. Apart from the FAO, no other international agencies have been active in developing the forestry sector in Angola.

[11] http://rainforests.mongabay.com/deforestation/2000/Angola.htm

[12] Interview with Tomás Caetano, General Director , Forestry Development Institute, Luanda, 11.02.09

[13] http://www.wrm.org.uy/bulletin/28/Angola.html and interview with Tomás Caetano

The Forestry Development Institute is aware of the CDM as a tool for promoting good practice in forestry management. Due to a lack of know-how and competent personnel (only 12 qualified forestry engineers in Angola), however, the Institute feels unable to promote and effectively utilize the CDM in any national projects, and is expecting the private sector, with the cooperation of local communities, to take a leading role in this respect.

There is an increasing interest from international companies in the forestry sector in Angola, in particular from Portuguese and Spanish pulp and paper concerns, specifically related to eucalyptus plantations as a source of cellulose.

6 Conclusions on capacity building needs

6.1 Establishment of the DNA

The most significant barrier to adoption of the CDM in Angola is the fact that the DNA is not yet in place. Establishment of the DNA is a political/legislative process, and from interviews with relevant stakeholders this process is under way (although no timetable was provided). In our opinion, capacity building is not required at this stage for establishment of the DNA, but will be required once the DNA is established.

6.2 DNA training and support

6.2.1 Operational support

Angola has only relatively recently ratified the Kyoto Protocol (May 2007), and, until very recently, there has been no Angolan involvement in any climate change negotiation. As highlighted in section 4.5, there is currently very limited CDM know-how and capability within the country and for potential staff within the proposed DNA. The most pressing issues which a newly established DNA will need to address are:

- Defining precise roles of the DNA;
- Development of Angola's sustainable development criteria with respect to CDM;
- Defining procedures for project approval;
- Designing and maintaining a publically accessible website containing all of the DNA procedures, criteria, and forms all in one place, as well as CDM resource material.

6.2.2 Short term staff training

Once established, the staff of the DNA will require training on the CDM rules and procedures pertaining to DNAs. This training should also be extended to members of any technical committee taken from other government bodies (see section 4.1) who are expected to assess proposed CDM projects. The DNA staff will also require training on how to assess projects with respect to the newly defined sustainable development criteria and procedures for project approval. In addition, for the DNA to be a resource centre, or at least an entry point, for project developers, they should be knowledgeable about accessing international CDM resources and information, organisation that can assist with CDM project development, and the basics of the international approval, certification and credit issuance process.

This type of training should be provided very soon after the DNA is established and the agency staff have been recruited. This need is best met by undertaking training workshops specifically targeted at the new agency staff.

6.2.3 "On the job" training

In order to reinforce the short term training provided above, the DNA staff would strongly benefit from working with project developers on concrete CDM project proposals. This would allow them to apply much of the "theoretical" lessons that they have been taught to real projects, and to appreciate the barriers which project developers face in preparing CDM projects. This training would increase their understanding of how a PDD is prepared and should be interpreted. This type of "on the job" training would also make it easier for new DNA staff to understand some of the more complex concepts and issues in CDM, in particular that of additionality, baseline setting, monitoring and the mechanisms used for stakeholder consultations. This type of training has usually been provided through a combined DNA staff training/project development programme.

It is expected that there will be a delay between establishment of the DNA and identification/proposal of potential CDM projects. For this reason it is recommended that the "theoretical" short term staff training detailed in section 6.1.2 is provided first, but should be undertaken in parallel with potential project identification so that the project development programme can begin soon after to provide "on the job" training presented in section 6.1.3.

6.3 Sector specific needs

6.3.1 Energy sector – calculation of the grid emission factor

As approximately 67% of generated electricity comes from hydroelectric plants, it could be expected that the grid emission factor for Angola is low. This conception could deter potential project developers and investors. However, due to the significant and increasing dependence on connecting diesel generators to these grids, or to using diesel generators for local mini-grids, it is possible that a high emission factor could be applicable to the separate grids.

Technical assistance and training is required for newly established DNA staff, in cooperation with relevant staff from the Ministry of Energy and from the state electricity generation and distribution companies (ENE and EDEL) to determine the emission factors for the separate grids, and for potential off grid developments. If these emission factors are found to be more significant for certain parts of the grid, focus could then be placed on using the CDM to attract private investment. As this is usually time consuming exercise, having the grid emission factor already determine and approved will facilitate the process for potential projects developers, and is therefore expected to encourage them to invest in CDM project development.

Once the DNA staff have been trained to calculate the grid emission factor, it is expected that they will be able to undertake a review of the emission factor on an annual basis, as it will need to be updated as year end electricity generation data is made available.

6.3.2 Energy sector – integration of CDM into development strategy

There is already awareness, specifically in the Ministry of Energy, that CDM can provide required revenues for development of the hydro power sector in Angola, in particular the small-scale hydropower sector, and potentially other renewable energy projects. However, there is limited appreciation of how to integrate the CDM into any long term strategy for development of the sector, and more specifically how to use the CDM to attract foreign investment in the sector. It should also be highlighted that the more projects in the sector that are implemented without the use of CDM, the more difficult it becomes to argue additionality for future potential CDM projects.

Through a combination of workshops and technical assistance, it is recommended that a review is carried out of the "Programme for development of small hydro electric plants" to determine the potential for CDM to attract carbon revenues for implementation of the small scale hydro power plants, to what extent the CDM can be integrated into the Programme and how it can be used to attract investment into the sector. The outcome of the grid emission factor calculation presented above will also influence this review.

Similarly a review should also be carried out on the existing plans for rehabilitation of the existing larger scale hydro power plants to determine the potential for use of the CDM to attract carbon revenues for implementation of these projects.

With respect to potential reputational risks associated with facilitating the development of hydro power projects, this is not considered significant providing the projects developed are mainly small scale hydro or rehabilitation of existing plants. Reputational risks may be more significant if new large scale hydropower projects are developed, and these should be assessed individually if proposed. However, the emphasis of the "Programme" referenced above remains with development of small scale plants.

6.3.3 Oil & gas sector

The oil and gas sector in Angola is the one sector where capacity building has already been undertaken, and where there is an awareness of the CDM. However, due to the delays in establishment of the DNA, developments to reduce flaring of gas have gone ahead independent of the CDM. This includes the Angola LNG project and the pressure from the Angolan government on oil companies to reduce flaring and re-inject associated gas into the oil reservoirs for future use. These developments serve as a barrier to the use of CDM for reduction of gas flaring, as it becomes difficult to argue additionality for any gas flaring projects already planned and approved as part of the development of the LNG plant. However, following completion of the Angola LNG project in 2012, it is estimated that 1 bcm of associated gas will still be flared in Angola. There is therefore still significant potential to use the CDM to reduce emissions from these remaining flaring activities.

Interest for CDM in this sector has probably also been dampened by the report commissioned in 2006 which concluded that there were significant challenges faced in registering the Angola LNG project as a CDM project, and that the emission reductions

were not certain to be significant. However feedback from experts and stakeholders in Angola would suggest that there is still interest in the sector in using CDM, and that this interest will be revived once a DNA is finally established[14].

Soon after the DNA has been established, a dialogue should be started with the relevant stakeholders at state and private company level to determine how the CDM can be integrated into current programmes and plans (where additionality is not compromised) and to determine the real potential for use of the CDM to further reduce associated gas flaring. This is best achieved through a series of workshops targeted at the oil and gas, where both representatives from state level and private companies are invited to discuss the potential for use of CDM in the sector, to identify specific projects where CDM could be used to reduce gas flaring and to formulate a strategy for use of CDM in connection with the Angola LNG project.

Reputational risks for Norway may arise if CDM is used for projects where flaring is banned by national law. However, in this situation the project could not be considered to be additional, and would therefore not be expected to be registered. Only if:

1. dispensation from the law is given to specific fields, or
2. it can be shown that the law is not enforced;

can a project be considered to be additional and a candidate for CDM. Norway may, however, run a reputational risk if it is seen to support a project which falls under the second scenario, as it is contentious issue as to whether these projects should be considered additional.

6.3.4 Other sectors

A project identification and development programme is required once the DNA is set up to raise awareness of the CDM and identify private and public sector organisations who may have potential CDM projects in the pipeline. These capacity building/project development programmes have been taken in many parts of Africa, and the experience from these should be reviewed in order to determine what would be successful in Angola. This programme should also involve DNA staff in order to provide them with relevant "on the job" training (see section 6.2.3).

6.4 Forestry

6.4.1 Capacity building of relevant staff

Given the significant forestry coverage, and the equally significant rate of reforestation in the country, forestry is an area which holds significant potential for carbon reductions. But, as admitted by the Director of the Forestry Development Institute there is no know-

[14] Meeting with Vladimir Russo, 10.02.09

how or competent experts in Angola to promote and effectively utilize the CDM in any national projects. The Director was particularly interested in learning how the CDM is potentially used in other African countries, and suggested holding regional workshop on the subject to exchange ideas and experience. If this has not been done before, it would seem to be an appropriate idea. This could also be followed with further training, potentially through exchanges with other African countries, and participation in project development programmes in order to increase the know how of relevant forestry staff.

6.4.2 Definition of forest for CDM

For a project developer to submit an afforestation or reforestation project proposal under the CDM, the host country DNA must first have agreed on a definition of "forest", within UNFCCC guidelines, and notified the UNFCCC of this definition. The ranges agreed by the UNFCCC are as follows:

- Crown cover of 10 to 30%
- Minimum land area of 0.05 ha to 1.0 ha
- Potential to reach minimum height at maturity of 2 to 5m

Angola has adopted one of the FAO definitions of forestry as having 10 – 15% crown cover. As Angola does not have an established DNA, this definition has not been submitted to the UNFCCC, so it may be a useful exercise to review whether the country's definition of forest is appropriate within the context of the CDM. This could be done as part of the capacity building for relevant staff presented above.

6.4.3 Development of A/R CDM projects

Many companies were said to be interested in exploiting Angola's forest resources, but not many were known to be interested in A/R CDM. However, there is a basis to start a dialogue with the private sector, and again, once the DNA is established, a CDM awareness raising and project development programme could be initiated. The participation of companies that are actively involved in A/R CDM projects in other countries in Africa (e.g. Green Resources AS[15]) would be invaluable in transferring experience.

6.5 Programmatic CDM

The challenge of using CDM to promote investments in renewable energy and energy efficiency in Angola, as in many African countries, is that the individual installations and sites are too small to be viable as CDM. For these small installations, the carbon revenue is too small to offset the transaction costs for preparing the CDM project documentation and getting the project registered. One solution is the newly approved "CDM Programme of Activities" (PoA) process, where a project document is prepared for a large

[15] Capacity building for CDM in Mozambique, Econ Pöyry, 2008

programme with many small sites, even if not all of those sites are known in advance. This allows the coordinating entity of the programme, whether a public or private entity, to apply for carbon credits for the entire programme, and pass those benefits along to the individual site owners. As this mechanism is relatively new, no CDM PoA projects have yet been registered, although 16 projects are currently at the validation stage[16].

Potential PoA projects in Angola include:

- Installation of pico and micro-hydro plants: the Ministry of Energy plans to install 10 – 15 of these units in the near future, at a cost of USD 8 million;
- Solar PV programmes for rural electrification;
- Improved cookstoves;
- Installation of small scale biogas units;
- Community based biofuel projects (based on jatropha).

The PoA process is a relatively new one, and training would be required in developing the relevant projects. Probably the best target organization for developing a first PoA project in Angola would be the Ministry of Energy, who have concrete plans to implement the relevant pico and micro hydro projects.

[16] http://cdmpipeline.org/publications/CDMpipeline.xls

7 Potential areas of intervention for Norway

Angola is one of the few countries in Africa where capacity on the CDM has been very limited. The main reason for this is that environment and climate change have not been high on the GoA's list of priorities since 2002, as the focus has been on rebuilding the economy after 27 years of war. However, the GoA has recently taken steps which indicate a more proactive focus on environment and climate change, manifested through the President's speech in the UN General Assembly, ratification of the Kyoto Protocol in May 2007, active participation at the Bali meeting, and speeches from the Minister for Environment at Poznan. As very little has been done with regards to capacity building for CDM, any financial contribution from Norway in this respect would make a significant impact. It will also allow any capacity building programme to be well targeted, and for different parts of the programme to be coordinated with each other for maximum effect (e.g. using the CDM project development programme as on the job training for DNA staff).

7.1 Providing an incentive

The main obstacle to seeing CDM projects being implemented in Angola is now the lack of a DNA. Until a DNA is established, further work on capacity building and identification of CDM projects is academic. Although, as concluded in section 6.1, establishment of the DNA does not require any capacity building programme, Norway could still potentially play a role in bringing establishment of the DNA forward. Meetings with relevant stakeholders has highlighted that there is a strong need for capacity building and training at all levels of the CDM establishment in Angola. Norway could play a very significant role in providing funds and know-how to satisfy these capacity and training needs. We would, however, strongly advise against making any commitment to investing in capacity building and training in Angola until the DNA has been established, or at least until strong commitment to establishing the DNA accompanied by a road map and timetable, approved at the highest possible government level, to how and when this DNA will be established. But a commitment from Norway to provide the relevant funds and know-how once the DNA is in place could act as an incentive to fast track the process of establishing the agency. Norway could, in addition, support this incentive by establishing a dialogue with the relevant agencies in Angola through a local expert. At this stage the most competent expert to fulfil this role in Angola is considered to be Vladimir Russo, although his current role as a consultant for the Ministry of Environment on climate change issues should be clarified to avoid any conflicts of interest. The role of this local expert would also include monitoring the process of establishment of the DNA on behalf of Norway.

7.2 Support and capacity building of the DNA

Once the DNA is established, assistance will be required in order to ensure that the new agency quickly becomes an effective and operational entity. This will require support in defining the DNA's roles and procedures, and support in developing the DNA's website. This should then be closely followed by training of staff to ensure that these roles can be effectively filled.

7.3 Technical assistance on CDM project identification and development

Project identification and development should start in those sectors where there is already an awareness and interest in CDM, and where a potential has already been identified. This included the energy sector and the oil and gas sector. A review of these sectors is required in order to evaluate the real potential for CDM. Priority should then be given to developing any necessary tool which may benefit a multiple developers/projects within these sectors. Examples of these include:

- Definition of the emission factor for the different grids and off grid projects which will facilitate the review of a number of projects in the sector;
- Development of new methodologies for the oil and gas sector, if required.

In parallel to working on sectors where the potential for CDM has already been highlighted, awareness of the CDM should also be promoted in other sectors where the mechanism is not well known in order to identify new project opportunities.

Project identification and development should also focus on the potential for use of the PoA mechanism in Angola, starting with the energy sector.

7.4 Support for the forestry sector

Responsibility for Forestry at Government level lies within the Forestry Development Institute, which is part of the Ministry of Agriculture. Although there is awareness of the CDM as a tool for promoting good practice in forestry management, there is also a complete lack of know-how and competent personnel to allow the Institute to promote and effectively utilize the CDM in any national projects. At the moment many companies are apparently interested in exploiting Angola's forest resources, but few interested in A/R CDM. This forms a basis for combining support and capacity building of the Forestry Development Institute staff with starting a dialogue with the private sector, and, assuming the DNA is established, a CDM awareness raising and project development programme could be initiated. There is a potential to make this part of a wider initiative aimed at sharing experience and know-how on how the CDM is potentially used in other African countries.

7.5 Recommendations

The following concrete recommendations are made for interventions from Norway to promote CDM in Angola, in order of priority:

1. Norway should make a commitment to provide the relevant funds and know-how once the Angolan DNA is in, and communicate this commitment to the relevant authorities (National Focal Point and the Cabinet of External Exchange at the Ministry of Environment) as an incentive to fast track the process of establishing the agency. Norway could, in addition, support this incentive by establishing a dialogue with the relevant agencies in Angola through a local expert.
2. Once the DNA is established:
3. Provide operational support and training of the agency's staff, including for determination of the grid emission factor in Angola;
4. Undertake a project identification and development programme open to all sectors of the economy;
5. Possibly as part of item 3 above, initiate a dialogue with the relevant stakeholders in the oil and gas sector to determine how the CDM can be integrated into current programmes and plans and to determine the real potential for use of the CDM to further reduce associated gas flaring;
6. Possibly as part of item 3 above, provide technical assistance to the energy sector on integration of CDM into development strategy;
7. Deliver a capacity building programme for the forestry sector, aimed at both relevant government staff (from the Forestry Development Institute) and relevant private sector companies;
8. Undertake a project identification and development programme targeted at potential PoA projects.

Table 2 presents a proposed plan of activities and timescale for interventions proposed above. This assumes a start date as soon as the DNA is formally established. It should be emphasized that many of the activities are interdependent. For example, awareness raising and project ID, and development of CDM strategy in the energy sector, will lead on to project development activity.

Table 7.1 Proposed plan of activities and timescale

Activity	Timescale							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
DNA staff training: short term								
DNA staff training: “on the job”								
Energy Sector: emission factor								
Energy Sector: CDM strategy								
Oil & gas: Opportunities for CDM								
Other sectors: Awareness raising and project ID								
pCDM: Awareness raising and project ID								
Project development: Large and small scale projects								
Project development: pCDM								
Forestry sector: Capacity building of staff								
Forestry sector: Project development								

Appendix A: CDM Stakeholders contacted

Institution	Name and position	Email	Cell
ADRA	Sérgio Z. Calundungo	s.calundungo@adraao.org	
Chevron / Angola LNG	Laurentino Silva	silvaml@chevron.com	+244 912 507067
Development Workshop	Allan Cain, Director	allan.dwang@angonet.org	+244 222 449494
Forestry Development Institute	Tomás Pedros Caetano, Genral Director	idf@netangola.com	+244 222 323934
Ministry of Energy and Water Affairs	Francisco Talino, National Director of Energy	talino@netangola.com	+244 222 39 18 39
Ministry of Energy and Water Affairs	Monzila Jackson		
Ministry of Environment,	Mr. Lucas Marcolino Miranda, CDM Focal Point	lcs_miranda@yahoo.com	+244 222 386650
Ministry of Environment	Arsénio Machado, Director of the Cabinet of External Exchange	arseniomachado@yahoo.com	+244 924 340630
Ministry of Environment	Amelia Gomes	ameliagomes@hotmail.com	+244 292 7230493
Ministry of Environment	Vladimir Russo, Special Advisor, Energy and Climate	roquerusso@nexus.ao	+244 912 321918
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Royal Norwegian Embassy	Thorstein Wangen, First Secretary	thwa@mfa.no	+244 923 41 6264
Royal Norwegian Embassy	Lise Stensrud, Minister Counsellor	lise.stensrud@mfa.no	+244 923 64 0196
StatoilHydro	Erik Holtar, Business Development Manager	erihol@statoilhydro.com	+244 222 398798
World Bank	Lisa Maier		+244 924 748832

Appendix B: Terms of Reference

"Clean Development Mechanism in Tanzania, Uganda and Angola"

B.I Background

Norad provides assistance to developing countries in the CDM field as part of its bilateral development cooperation. Funds for private sector development earmarked for climate related cooperation can be used for support to development of specific projects, as well as capacity building and institutional cooperation.

The distribution of CDM projects among Kyoto Protocol non-Annex B countries is highly uneven. Some countries, especially the Least Developed Countries (LDCs) are all but non-existing in CDM pipeline statistics. There are several reasons for these countries' lacking ability to benefit from the possibilities to promote investments and sustainable development. It is assumed that lack of capacity in the institutional framework and the CDM enabling framework are important factors, along with the general invetsment climate and risks.

Norad thus wishes to target our assistance towards strengthening these countries' capacity within CDM to enable them participate in the carbon market and reap the benefits from the mechanism.

Based on a pre-mapping and contact with the embassies in a number of countries, Norad has selected Tanzania, Uganda and Angola as focus countries for this effort.

B.II Purpose

The primary objective of this assignment is to map and analyze the capacity to identify and develop CDM projects, with the goal of identifying needs and propose areas of improvement for possible Norwegian support to capacity development.

The results will be used to advise Norad and the embassies on how to promote initiatives in cooperation with relevant stakeholders and how to strengthen the countries' capacities within CDM.

The team shall also present an overview of potential CDM projects with a brief analysis of major challenges related to the approval process

The assignment shall be carried out in close dialogue with key actors in the concerned countries.

B.III Scope of work/priority issues

The team has two major tasks:

1. to carry out a mapping of the CDM status for each country
2. to propose capacity building initiatives for possible Norwegian support

Task 1 should cover the following aspects:

- A general overview of the countries' ongoing an planned CDM activities;
- An overview of the institutional framework, players and stakeholders (e.g. DNA, local scientists and consultants, Department of Energy, etc.) and their strengths and weaknesses;
- Bottlenecks that hinder CDM development;
- Other donors' efforts and initiatives on CDM;
- Identify needs for capacity building, (preferably) avoiding overlap with ongoing efforts by other donors, so as to avoid duplication of other donors' efforts/programs.
- Potential for CDM projects for various sectors, including if possible concrete projects in the relevant sectors.

Task 2: A proposal for areas of CDM capacity building cooperation with Norwegian assistance should be developed in line with the following:

- The proposed areas should be based on identified bottlenecks and needs for capacity building
- Initiatives should target sectors or fields of expertise in which Norway has expertise and can add value
- Harmonization with other donors' programs – avoiding overlapping efforts
- Initiatives should be developed in understanding with the related authorities who will be the owner of the project(s)/programme
- In order to ensure good effect of the capacity building initiatives, concrete projects should be implemented in parallel. Identifying potential projects during the mapping phase will therefore be an advantage.
- The propsal should also consider how cross cutting issues such as gender and anti-corruption may be an integral part of the recommended activities

B.IV Implementation of the work

A. The plan for implementation

The plan for implementation shall follow the description given in 'Proposal T-2008-314 Clean Development Mechnism in Angola, Tanzania and Uganda'.

B. Team composition

The Team shall consist of:

- Francois Sammut
- Knut Ødegaard
- Maja Tofteng

Norad will include own staff in the team for certain parts of the assignment.

A. Source of information and methodology to be applied

The study shall (mainly) be done as field work in Tanzania, Uganda and Angola.

The team is expected to meet with:

- relevant project developers
- relevant government representatives (first and foremost representatives from the Designated National Authority)
- the Norwegian embassy
- other relevant donors
- other partners and stakeholders who might provide relevant inputs

It is also important that the team consults and coordinates its work with other relevant publications and work on CDM (e.g. other donors' efforts, scientific publications, relevant energy masterplans, etc.).

CDM-related information from the Embassies in each country will be made available to the team, giving an early indication of specific fields which may need special attention.

A. Timetable for preparation, field work and finalisation of report

Schedule and tentative time frame:

- The assignment shall be carried out and finalized by March 1, 2009.
- The total number of work days for the whole assignment is expected not to extend a total of 36 days, including travel. The work shall be done within the following time frame:
  a) 6 days of field work in each country, for a total of max 18 days,
  b) 3 days per country, for a total of 9 days, for preparations in Norway before the travel (to get an overview and get relevant contacts in the concerned countries, etc.); and
  c) 9 days for the finalization of the report and briefing(s) with Norad after the consultant has returned to Norway

B.V Reporting

- The report shall contain a summary of the main findings, main conclusions and recommendations. The specific proposals for initiatives to assist the countries in strengthening their institutional framework for CDM facilitation shall be a separate chapter in the report.
- The report shall be written in English and not exceed 20 pages for each country excluding annexes.
- A draft report shall be presented to Norad. The team shall deliver the final report based on comments given to the draft report.
- The final report shall be submitted in electronic form within two weeks after Norad and the embassy have given their comments to the draft report.

Mari Sofie Furu 18.12.2008