

ANNEX 5: ENGINEERS MINI WORKSHOP PROCEEDINGS

CENTRE FOR ENERGY, ENVIRONMENT, SCIENCE AND TECHNOLOGY (CEEST) FOUNDATION

Proceedings of the Mini-Workshop on Capacity Development  
for Clean Development Mechanism (CD4CDM) held at Courtyard Hotel

on  
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P. O BOX 5511

DAR ES SALAAM

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# Opening Session

## *Introductory remarks by Hubert Meena, Director, CEEST Foundation*

Honourable Guest of Honour,

Let me take this opportunity to thank you for finding time to come and share your experience with your fellow engineers this morning on issues related to the Clean Development Mechanism (CDM). I welcome you to this mini workshop and I welcome the participants to this important event.

The Centre for Energy, Environment, Science and Technology, CEEST Foundation in collaboration with the EPMS, With support from the UNEP Risø Centre are implementing a project on Capacity Development for the Clean Development Mechanism” financed by the Dutch Government. CEEST Foundation and EPMS are the local partners in implementing the project in Tanzania.

The CD4CDM project is designed in line with the emphasis in the decision on full utilization of national and regional institutions and “learning by doing” combined with a large element of experience sharing ([www.cd4cdm.org](http://www.cd4cdm.org)), ([www.ceest.co.tz](http://www.ceest.co.tz)) ([www.epms-tanzania.org](http://www.epms-tanzania.org)).

The project is intended to help to establish CDM projects that are consistent with national sustainable development goals, It will develop national capabilities so that at the project’s conclusion there are persons in the country that are capable of analyzing the technical and financial merits of projects and negotiating possible finance agreements with Annex 1 countries or investors.

### **Objectives of the CD4CDM**

- ✓ Improving Tanzania’s institutional preparedness for hosting CDM projects, including kickstarting
- ✓ Conference of the Parties Decision 17/CP.7 Defines CDM modalities and procedures, paper FCCC/CP/2001/13/Add.2 Stating, among other things that:
  - Participation in a CDM project activity is voluntary
  - Parties participating in the CDM shall designate a national authority for the CDM
- ✓ It is therefore, the objective of the CD4CDM project to ensure that the Designated National Authority (DNA) has its capacity built so as to be able to efficiently approve CDM projects consistent with the country’s sustainable development priorities.
- ✓ Building the capacity of local experts in key sectors in the identification, design, and implementation of CDM projects.
- ✓ Building the capacity of relevant institutions in appraising, funding, and promoting CDM projects and carbon offset investments in Tanzania.
- ✓ Promoting Tanzania as a CDM investment destination.

- ✓ Supporting the development of a pipeline of actual CDM projects.

### **Initial CD4CDM activities in Tanzania**

- ✓ Identification of the key local stakeholders expected to play a role in CDM project development, approval &/or facilitation, so that the capacity of the target group is developed, including training on PIN/PDD preparation.
- ✓ Preparation of a CD4CDM project fact sheet and introductory letter to be sent to relevant ministers & stakeholders.
- ✓ Assist and advise the government in operationalization of DNA (e.g. formulate project review/approval committee, design procedure for project review by DNA, formulate job descriptions for DNA staff, etc.) Assess office equip. needed for DNA. Procure approved items for DNA.
- ✓ Design a proposed Sustainable Development Criteria to be used by Project Review Committee for CDM project approval.
- ✓ Design a national, English CDM web site for Tanzania (site contents to include the national CDM portfolio, Project idea Notes (PIN(s)), Project Design Document (PDDs), steps for national CDM Project Approval Procedure, info on CDM potential in the country, etc.).
- ✓ Design a proposed CDM Project Review Procedure.
- ✓ Organize two national workshops as well as relevant training of the relevant stakeholders.
- ✓ Arrangement for the development of a national portfolio of CDM project PINs and PDDs, as well as invitation for submission of PINs. The Pins shall also be discussed in the national workshops.
- ✓ To influence the policy, legal and institutional process for CDM approval in the country
- ✓ Support DNA on issues pertaining to CDM project promotion: Development of a "CDM Investors' Guide for Tanzania". Advise DNA on publications and material to be taken to Carbonexpo
- ✓ In cooperation with URC and World Bank's CF-Assist to arrange for Tanzania's participation Carbonexpo 2007 or 2008. CD4CDM to support travel of two Tanzanian stakeholders.

### **Other Project Deliverables include**

- ✓ Inputs to DNA Statutory Regulation and Cabinet Paper/National CDM Action Plan
- ✓ Operational Guidelines for DNA and its sub-committee members
- ✓ National CDM website: design, hosting, updating and maintenance
- ✓ Several PIN(s) meeting quality criteria with meeting quality criteria and should lead to obtaining up to 2 validation quality PDDs.
- ✓ Project mini-workshops
- ✓ Newspaper articles as well as radio/TV segments for public awareness-raising
- ✓ One Parliamentary briefing and one Ministerial luncheon briefing, and summary reports of the proceedings with recommended actions

*Opening remarks by Prof. M.J. Mwandosya, Minister of State, Vice President's Office (Environment)*

A talk on CDM by Prof. M.J. Mwandosya, Minister of State, Vice President's Office (Environment) to Engineers

The Guest of Honour Hon. Prof. Mark Mwandosya started by saying that Tanzania and the African continent in general, were far behind in the issue of Clean Development Mechanism (CDM) as compared to other continents like Europe, Asia and Latin America. He said that CDM owes its origin from the Climate Change Convention which resulted from Rio convention in 1992 where the head of states agreed on several issues which included, among others, the issue of climate change. Concerns of climate change causing the rise of sea levels, occurrences of extreme weather events, occurrence of floods and severe drought were among indicators of climate change. The summit agreed to adopt the climate change Convention which came into force in 1994, and became a legally binding to its Parties.

The objectives of the Climate Change Convention were to stabilize the GHG concentrations at levels that would prevent dangerous anthropogenic interference with the climate system that would pose a threat to food production and human development.

Article 4 and article 2 paragraphs 3 and 5 of the convention commits developed countries to provide financial support and transfer of technology needed by developing countries in order for them to meet what will be agreed as full incremental costs of implementing commitments by developing country parties. Parties to the Convention found in the beginning that the commitments were not enough and therefore allowed for the review of the Convention in order to strengthen the commitments. Therefore, the convention is constantly reviewed to see whether it addresses the issues proposed. At the First Conference of the Parties (COP I) which took place in Berlin, it was realized that measures that had been formulated were inadequate to bring the GHG concentration at level that existed in 1990 and therefore began to negotiate for a protocol that would strengthen the commitments. The negotiations led to the Kyoto Protocol agreement in 1997, which came into force in 2004.

Where does an engineer come in?

The Convention and the Kyoto Protocol indicate the greenhouse gases in question to be Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O) Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF<sub>6</sub>). It is in the sectors of energy, especially fuel combustion and energy industries, manufacturing industries and construction, transport, industrial processes, forestry, land use, agriculture and livestock, among others, almost in every sector, engineers are involved in the way of designing cost effective and win-win technologies which is also environmental friendly.

Kyoto protocol:

The Protocol binds the developed countries to implement the United Nations Framework Convention for Climate Change (UNFCCC) in 1994 negotiation process. In the protocol there is a provision that parties can undertake activities jointly (developed and developing countries) to implement their obligations. The principles of the convention were i) Equity (we live under the same planet), and common but differentiated responsibilities and respective capabilities. This is reflected in the differences inherent in different counties with respect to environmental destruction and abatement.

Where does CDM come in?

CDM is defined in Article 12 of the Kyoto Protocol to the UNFCCC during the 3<sup>rd</sup> conference of parties (CoP3). It is an instrument aimed at fostering the cooperation between Annex1 parties to the convention (developed country parties) and non-annex 1 parties (developing country parties) in the attainment of sustainable development and in meeting the ultimate objective of the convention. CDM is the ultimate product of what was a proposal by Brazil on what to be included in the protocol to strengthen the commitments of Annex 1 Parties.

In future emissions would come from developed as well as developing countries (Brazil, India, China South Africa etc) meaning that Co2 levels would continue to increase. Therefore developed countries compromised with developing countries to adopt CDM. Countries implementing CDM are not legally bound to do so. However, in so doing they should use climate friendly technologies and the CDM projects should be sustainable and should be within the priority areas of the developing country concerned. On the other hand, developed countries get credits from Carbon Emission Reductions (CERs).

CDM is a mitigation process, achieved in three ways including (1) Joint implementation (developed country working together with another developed country on a climate change mitigation project in a developed country or country in transition), (2) Emissions Trading (Carbon Marketing) and (3) Clean Development Mechanism (CDM) where developed country works with a developing country on a mitigation projects in the developing country.

Worldwide the carbon trading/market is a big business e.g. in 2005 there were 710 million tones of carbon worth \$10 billion were transacted and in 2006 there were 1639 million tones of carbon worth \$30 billion transacted. European Union is the most active and earned \$ 7 billion from carbon trading in 2005. New markets are now open elsewhere in the world. There are primary and secondary CDM projects in place. It is hoped that knowledge in CDM will help us to enter these markets in the near future.

Of the countries currently implementing CDM projects, India with 283 projects ranks number one. Other countries involved in CDM projects include, China (120), Brazil (108). The African continent has only 21 projects, of which South Arica alone has 10, while others include Egypt (3) Morocco (3) Tunisia (2) Nigeria (1) Uganda (1) and Tanzania (1). The project in Tanzania is the 'Mtoni Landfill Project' with aim of converting methane to generate electricity. It is anticipated to generate 2,500 CERs per year for 10 years. It intends to sell 2.3 – 5 Megawatts of electricity to the Tanzania Electric Supply Company Ltd (TANESCO). 2.5 % of the CERs will go to DNA. The guest of honour also said that the private sectors were the key drivers in the CDM project.

Importance of the Meeting:

The Green House Gases (GHGs) concerned in mitigation were carbon dioxide, methane, nitrous oxide, Hydro fluorocarbons, chlorofluorocarbons (CFCs) and Sulphur hexafluoride (SF6). On the other hand, the sectors that were potential emission sources are energy, fuel combustion, industry, transport, solid waste disposals, and process of mineral products, others are agriculture, savannah burning, and waste disposal. In all sectors where there are potential for CDM projects there must be an engineering problem to have an engineering solution. Therefore it has been found important to interest engineering into involving themselves in CDM projects so as to utilize effectively the capacities available in the country so as to contribute to sustainable development while at the same time contributing towards solution of the global problem of greenhouse gas emission mitigation.

*Vote of thanks by Mr. K. F. Manyika, Vice President's Office (division of Environment)*

Mr. Manyika, thanked the Guest of honour for his educative lecture /speech he delivered and hinted that the workshop participants would use his lecture as a backbone to the deliberation in the mini-work, intended mainly for engineers.

## PRESENTATIONS

The Mini-Workshop was chaired by Eng. S.N.A Kassera, Secretary ..... Repporteurs were Mr. Maynard Lugenja and Ms Mariana H Massawe.

*How to Make CDM Implementation Succeed in Tanzania: The role of Engineers: By Hubert E. Meena<sup>1</sup>*

### The presentation

- § Overview:
- § Clean development Mechanism
- § Modalities for implementation of CDM
  - Participation

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- Implementation process
- Methodological issues
- § Roles of various stakeholders
  - Ownership of projects and process
  - Profit motives (more credits at less costs)
- § Challenges

## The Clean Development Mechanism (CDM)

- § Clean Development Mechanism (CDM): essence and objectives
  - CDM was established in Kyoto, Japan in 1997 at the third Conference of the parties to the UNFCCC;
  - CDM is a mechanism for achievement of the UNFCCC through collaboration between developed and developing countries
- § Principles that need to guide CDM
  - Protection of climate system by ensuring that Developed (Annex I) countries meets their obligations of reducing GHG emissions
  - Promotion of sustainable development for the developing countries (non Annex I countries)
  - Addressing specific need and circumstances of developing countries
- § Criteria for implementation of CDM
  - Voluntary participation approved by each party involved
  - Real, measurable, and long-term benefits related to the mitigation of climate change
  - Reductions in emissions to be additional to any that would occur in the absence of CDM projects
- § CDM Process
- § Modalities for CDM Implementation
- § Referred to in Decision 17/CP.7
- § Recognises the need for guidance for project participants and Designated Operational Entities in particular, for establishing reliable, transparent and conservative baselines.....
- § Participation Requirements

- § COP Decision 17/CP.7 Defines CDM modalities and procedures, paper FCCC/CP/2001/13/Add.2 Stating, among other things that:
- Participation in a CDM project activity is voluntary
  - Parties participating in the CDM shall designate a national authority for the CDM
  - A party not included in Annex I may participate in a CDM project activity if it is a Party to the Kyoto Protocol
  - Project Design Document (PDD)

## EIA

Description of (local) public consultation and resulting adjustments to the plan

Proposed monitoring methodologies conform M&V requirements

Project must not divert ODA,

Technology (transfer) must be sound and safe.

Written approval must be obtained from donor and host countries, stating their voluntary participation

## § Project Design Document

### § To guarantee successful registration and validation, the PDD must include:

- calculations of baselines and additionality
- description of boundaries,
- leakage potential,
- national policy and context of host country,
- Crediting period.
- CDM Project Development

## § Project Appraisal Involving

- Definition of Project Boundaries
- Assessment of Country Context
- Assessment of Additionality
- Definition of Crediting Lifetime

- Projection of Baseline Scenario
- § Determination of Emission Reductions
  - Project emissions based on
    - emission factors (e.g. tCO<sub>2</sub>/MWh) - can be zero
    - project activity (e.g. MWh)
  - Baseline emissions based on
    - emission factors (e.g. tCO<sub>2</sub>/MWh)
    - level of baseline activity considered 'appropriate'
      - e.g. MWh from plant, number of kerosene lamps
  - Equivalence of service where possible
  - CDM Analytical Process
- § Methodological Issues
- § Development of the baseline scenario
  - Macro economic projections and long term development scenario
    - *This is the main input in any mitigation analysis. It also feeds the energy system analysis with the data on potential economic growth and associated energy demand.*
  - Technological development in the baseline scenario
    - *This provides data for the energy demand and supply options. It also provides an input for computation of associated greenhouse and other environmental pollution due to energy production.*
  - Greenhouse gas emissions from important sectors under the baseline scenario
    - *These are measured on the basis of energy system expansion by source and fuel. Using the relevant emission factors the baseline emissions are evaluated and mitigation options proposed.*
- § Development of the mitigation scenario
  - Macro economic and technological implications
  - Emissions reduction implications
  - Costing of the technological options for GHG mitigation

- Multi criteria analysis
  - Decision Aiding Tools
    - *These are models and other tools which are used to assess the energy systems emissions and other environmental impacts.*
- § Role of Governments in CDM
- § Define sustainable development
- § Set priorities
- § Identify project areas
- § Approve CDM
- § Providing incentives for private sector investment in CDM
- § Set up legal and regulatory and administrative framework
- § Coordination at country level
- registration of projects
  - registration of certifiers
  - registration of independent verifiers
  - auditing
  - clearing house
  - information
- Who funds CDM country administration?
- Decide on proceeds of CER
- CoP/MoP
- Executive Board
- Challenges
- § Institutional framework for CDM implementation: Formation of CDM entities:-
- Institutional and technical arrangements should be put in place
  - The role of current National Climate Change Committee

- Involvement of other institutions with investment and sustainable development relevance, (Investment Promotion Centre, President's Office-Planning and Privatisation, Ministry of finance, Cleaner Technology Centre, Chambers of Industry, etc.)
  - Secure capacity building resources from international agencies for this process
- § Project based activities conception approval and implementation
- Ø Develop technical skills for handling of project activities
  - Ø Develop institutional framework for the same
  - Ø Develop the approval process
- Selection and analysis of CDM projects
- Identification of implementation barriers, capacity needs and institutional framework.

## Discussion

The audience raised several issues on the presentation as follows:

**Qn.** Do we have national audited documents where a CDM project can invest/start?

**Response:** In environmental management section there is auditing which is guided by environmental management plans which come in operation after EIA. We also have a websites in which areas of investment have been posted. This website will start any time.

**Qn.** Can an existing industry become a CDM project?

**Response:** Yes, it only depends on the methodology how it was and after the project how will it be to become additional. Example Mtibwa Sugar factory is generating electricity from the waste products – bagase. This electricity is being used to run the industry and the excess units will be fed into the National Grid.

**Qn.** Wandered, if there were any local designated operational entities (DOE) and who appointed them?

**Response:** They apply to the Executive Boards but with some criteria.

**Qn.** Wandered, if CERs taxable?

**Response:** Yes, income tax is paid just as any other investment enterprises. Besides, all CDM projects go through Environmental Impact Assessment (EIA). Usually CERs for developing countries are not taxed. Although in Tanzania part of the money obtained from selling of CER has to be used by DNA for coordination of activities. However, in other countries e.g. India, 2% levy is charged for the country development.

**Qn.** What is safe and sound technology?

**Response:** Not any technology is accepted in Tanzania. The technology used should be tangible and has to be verified through COSTECH. It should be straight forward.

**Qn.** Copies of presented papers to be provided to participants for easy of following

Response: ok

Qn. wondered why there were no many projects?

Response: Limited by lack of local initiatives. Once the website has been established it will be easy to see which areas are acceptable for CDM projects.

Comment: awareness in CDM project is the problem in our country but this is a good start

## *Status of CDM project Activities and Approval Process in Tanzania: By K. F. MANYIKA<sup>2</sup>*

### The Presentation

Introduction:

The DNA

Tanzania officially established her DNA in 2004

The DNA of Tanzania is the Division of Environment, Vice President's Office

Its responsibilities include:-

- ü Issue approval letter of CDM projects,
- ü Confirmation of national sustainable development criteria
- ü Coordination of national agencies/stakeholders
- ü Provision of procedures for registering and in-country monitoring of CDM project activities

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<sup>2</sup> Environmental Officer, Division of the Environment, Vice Presidents Office (VPO), P.O.BOX 5380 DSM.

Clear guidelines on priority areas for projects, and on national project approval criteria

The DNA is assisted by a review committee with members from various sector

Tracks and controls CDM project activities in the country

CDM project activities Implementation Guide

Structure of the DNA

(Figure)

Eligibility criteria for CDM projects in Tanzania

The Tanzania's DNA has identified the following criteria for CDM projects: Project should address:-

National Strategy for Growth and Reduction of Poverty (2005), the National Vision 2025 and Zanzibar vision; that it should aim poverty alleviation by generating additional employment and improving standard of life bring in additional in additional investment.

- Environment Management Act, 2004 and its EIA and Audit regulation 2005
- Transfer appropriate environmentally sound technologies
- Address National Environmental Policy and related action plans and strategies
- Partnership with some local institutions
- Energy projects particularly in rural areas are accorded the highest priority;

CDM Projects Approval Process in Tanzania:

Project developer submit a PIN and PDD to the DNA (in this case the VPO – DOE)

The DNA will check whether the project address the following;

Social warefare: the CDM project activity should be consistent with NSGRP/MKUKUTA 2005, and that it should aim at poverty alleviation by generating additional employment and improving standard of life

CDM project approval... checklist...

Economic warefare; the CDM project activities should bring in additional finance investment and should be consistent with the Vision 2025 and 2020 for Tanzania mainland and Zanzibar respectively.

Environmental friendly; the project activities should be consisted with EMA 2004, and its EIA and Audit Regulation 2005

The project should reflect resource sustainability and resource degradation if any, impact on biodiversity, human health and other environmental issues

Technological issues; the CDM project activities should lead to transfer of environmentally benign and sound technologies to Tanzania

Status of CDM projects in Tanzania:

1 Registered project: Land Fill gas and Electricity generation at Mtoni damp site (202,271 CERs, 3.5 - 5 MW annually)

1 PIN – given letter of no objection: Wind Energy- Singida, 70,000 CER, 50MW annually)

About 7-10 PINs under development through CDCDM capacity building project UNEP RISO): Examples:-

Methane recovery and destruction through bio-digester- 9859m<sup>3</sup> methane, 6935.85 tCO<sub>2</sub> eq in 10 yrs

2 Afforestation projects

1 biogas production from sisal (Katani Ltd- Tanga, 150kW currently being produced, 4MW from four sites)

Challenges/constraints

Inadequate awareness to some key stakeholders in the industrial sector

Lack of funds to finance upfront costs (PINs, PDDs)

Slowness in getting feedback from stakeholders

Inadequate financial resources to support DNA activities- awareness

Few numbers of staff at the DNA

Reluctance of some business/financing sector to support implementation of CDM projects

Conclusion:

- Approval and register of some CDM project activities at country level stimulates interest for participation in CDM project activities
- Capacity building on project development should be emphasised to foster active participation in CDM project activities
- CDM projects activities are likely to grow in a near future
- Practitioners such as engineers have very significant role and challenge to foster implementation of CDM projects in the country

Discussion:

**Qn.** Is there any indication that foreigners are interested in making partnership?

**Comments:** Katani Limited is doing fuel switch – an opportunity for CDM. They are using the decorticator (sisal waste) which produces methane to generate electricity through gas engine. Since 90%

of the sisal leaves are waste then it is a potential source of energy. CH<sub>4</sub> –is a good source of energy with high BTU. They generate 150 KW electricity. Several companies are now doing energy switch e.g. Tanga cement needs a lot of waste material to generate electricity. Also ATMAS in Lindi and Mtwara are using natural gas which has less emission. It is also fuel switch and it falls within the responsibility for an engineers.

**Qn/.Suggestions** – Organize a visit to see Mtoni project to expand the know how!

**Challenge:** CDM is a business undertaking, business people are interested in social and financial viability of any project while the government is interested in social benefits, and therefore private sectors want to see the profitable financial returns in any CDM projects

**Qn.** Worried about Mtoni that the project can be lost to ‘wazungus’ and that many foreigners are ready to invest- what they need is only permission from the DNA.

### *Project and Project Idea Note (PIN): By Steven M. Mwakifwamba<sup>3</sup>*

## The presentation

### CDM Projects

- CDM projects allow Annex 1 countries, which have ratified the Kyoto protocol to invest in projects, which reduce GHGs in non Annex 1 countries while contributing to sustainable development.
- By investing in non Annex 1 countries, investors from Annex 1 countries can earn certified emission reductions (CERs) that they can use to meet their GHG reduction commitment under the Kyoto Protocol.
- CDM projects help both developed and developing countries work together to achieve sustainable development and decrease GHG emissions.

### § Goals

### § Article 12 of the Kyoto Protocol sets out three goals for the CDM:

- To help mitigate climate change;
- To assist Annex I countries attain their emission reduction commitments and;

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- To assist non-Annex I countries achieve sustainable development
- § Criteria for CDM projects
- § CDM projects have to meet the following criteria:
- CDM projects are voluntary, and must have the host country's approval;
  - Projects must be able to show long-term climate change mitigation benefits;
  - CDM projects must meet the sustainable development goals defined by the host country;
  - Projects must contribute to emissions reductions above-and-beyond business-as-usual (so called "additionality");
  - CDM projects must account for GHG emissions that occur outside the project boundary that are attributable to the project; (the so called "leakage")
  - CDM projects must include the participation of stakeholders and their opinions have to be taken into consideration;
  - CDM projects are limited to non-nuclear technology and there is a limited amount of forestry credits that are eligible;
  - CDM projects must not divert from other development assistance;
  - CDM projects are limited to strict physical boundaries within which GHG emissions will be reduced or sequestered;
  - CDM projects are limited to those countries that have ratified the Kyoto Protocol;
  - Projects do not have negative collateral impacts on the local environment;
  - Projects are able to show quantified real long-term climate change mitigation benefits;
  - Projects are related to the gases and sectors defined in Annex A of the Kyoto Protocol or related to afforestation and reforestation.

#### GHGs and Gas Classes

§According to the Kyoto Protocol, projects that reduce six GHGs and gas classes may qualify for CDM projects; these come from various sources of the economy as shown in Table 1 & 2 below.

Table 1: Different GHG/classes and their sources

GHG or GHG Class	Sources
CO2: Carbon dioxide	Fossil fuel combustion; deforestation; agriculture

CH4: Methane	Agriculture; land use change; biomass burning; landfills.
N2O: Nitrous oxide	Fossil fuel combustion; industrial; agriculture
HFCs: Hydro fluorocarbons	Industrial/Manufacturing
PFCs: Per fluorocarbons	Industrial/Manufacturing
SF6: Sulphur hexafluoride	Electricity transmission; manufacturing

Table 2: Eligible Sectors and Sources

Sector	Source Category
Energy	Fuel combustion: energy industries; manufacturing industries and construction; transport; and other.
	Fugitive emissions from fuels: solid fuels; oil and natural gas; other.
Industrial processes	Mineral products; chemical industry; metal production; other production; production and consumption of halocarbons and sulphur hexafluoride; others.
Solvent and other product use	Agriculture; enteric fermentation; manure management; rice cultivation; agricultural soils; prescribed burning of savannas; field burning of agricultural residues; others.
Waste	Solid waste disposal on land; wastewater handling; waste incineration; others
Land-use, land-use change, and forestry	Afforestation and reforestation; woodlots; plantations; agroforestry.
Renewable	Wind; solar; biomass; hydro; geothermal
Efficiency	More efficient equipment processes or design.
Industry Efficiency	Boilers; motors; lighting
Cogeneration	Chemical, paper and metallurgy, oil refining
Retrofits	Iron and steel sector
Production process	Efficiency improvements in design and production
Waste fuels recovery.	Cement sector; landfills.
Household Conservation	Education and outreach
Appliances	Solar water heaters; biomass cooking stoves
Lighting	Fluorescent light bulbs; interior design.
Transportation Fleet vehicles	Alternative fuel vehicles
Mass transit	Expand existing forms; light rail.

#### § The Roles of Engineers in the CDM Projects

#### § Project Consultant

- Project write-up
- Local Partner with foreign companies
- Developing baseline scenarios

- Calculation of CER
- § Project design
  - Energy efficiency (in industries and commercial buildings)
  - Co-generation in industries
  - Mini-hydro projects
    - § CD4CDM will;
    - § Assist local project developers to prepare Project Idea Notes (PINs)
    - § Create a national CDM web site
    - § Create a network
    - § Project brochure
    - § Produce articles/features in Newspapers and TV

#### Discussion/Comments:

- The amount of GHG production and why it is a problem to start a CDM project in Tanzania is associated with getting reliable data especially in energy sector therefore it was argued that people have to keep data properly and that CDM process is cumbersome so something has to be done to attract many private investors.
- Recommended the idea of workshop, and wondered if the bodies like Tanzania Investment Center (TIC) disseminate the information as it is required. He added that people need to change altitude on the whole issue of capacity building and getting important information and that we have to trust our own people.

Qn. Whether there were any tools available to measure GHG emissions.

Response: IPCC & WMO – established methodology for calculating emission factor. Also there are different methods; we can use National methodologies to calculate emissions.

## WAY FORWARD

### *Lessons learned*

- CDM and carbon trading are potential business opportunities in Tanzania
- CDM process and approval procedure,
- CDM implementation and development in TZ, and the awareness of these projects in institutions, industries etc.
- The CDM project procedures including the PIN, PDD etc.
- CDM projects and appraisal processes.

- CDM opportunities offer enormous energy and environmental conservation business opportunities.
- Areas of CDM projects in Tanzania and how practitioners and the environment sectors can contribute to make it sustainable
- The roles of engineers in implementation of CDM projects.
- The role of engineers in sustainable development of the country and the world at large by just participating fully on the issue of preserving our environment (i.e. reduction of GHG) and most of all to be responsible for the issues of cleanness of the environment
- There is business to be made in west especially in GHG
- Promotion of clean environment by mitigating the GHG Project idea note (PIN) needed to prepare CDM projects.
- Clean Development Mechanism as derived from the Kyoto Protocol and conventions and the stand of Tanzania on this issue.
- The background of Kyoto protocol adopted in 1997 and the GHG emissions
- Developments in designing and implementing sustainable engineering practices in conformity with Kyoto protocol
- The meaning and objectives of CDM, and what is a PIN and its inclusions
- Carbon business on implementing CDM
- Presence of CDM projects in Tanzania, carbon market and CERs
- Made aware of the existence of CEEST – foundation and the DNA entities involved in promoting and creating awareness on CDM as well as their roll in initiating beneficial CDM projects to Tanzanians but at the same time creating employments and business opportunities.
- The government involvement in encouraging CDM projects development in Tanzania.
- The economic, social and environmental values that accrues from implementation of CDM projects.
- The baseline of the project is the reduction of the gas being emitted currently and after the project implementation is expected to be achieved socially and economically
- It is possible to electrify rural areas through CDM projects
- It is possible for an individual to initiate a proposal in CDM
- CEEST capacity and knowledge base for references on CDM
- Have a potential for developing a potential CDM project [salewi@hotmail.com](mailto:salewi@hotmail.com)/[ilo.org](http://ilo.org) , Mobile07842125207
- Involvement of engineers in CDM activities and how a project developer and consultant can work with engineers.
- Tanzania is too much behind on CDM projects while it was supposed to have hundreds of such projects.

### *What could have been improved?*

- City council engineer should be invited to explain Mtoni CDM project
- More people/engineers should be invited
- Encourage many engineers especially from higher learning institutions to attend such type of w/shop for wide dissemination of CDM issues to students

- Other stakeholders such as private sector entrepreneurs, bankers, construction firms, industrial, transportation sectors etc should be invited in the workshop for different ideas and challenges
- Invite academicians so that we can get local DOEs
- Presentation was usually impaired by the choice of the color used
- The workshop should be longer than one day to cover topics thoroughly and to elaborate emerging issues.
- Raising awareness by arranging more frequent seminars/workshops etc.
- Copies of papers presented should be handed for participants references
- Presentation of CDM project and examples for better understanding
- More presentations with additional clarification on the role of each project participant
- The min-workshop should have told us why we come in too late
- Devise programs of creating awareness to grassroots so that there is transparency
- Training local participants on CDM

### *What should be the way Forward*

- Improve dissemination of information to various stakeholders and the general Tanzania community over the issue
- Publicize CDM in TVs using examples of existing projects
- Small scale CDM project should be accepted provided they have similar objectives
- In the coming workshop invite the same members so as to get good feedback
- Devise ways of creating awareness to all stakeholders about CDM projects
- Sensitization seminars and future field visits to industries /institutions to discuss with the management
- Massive mobilization on the importance of CDM projects to the population because engineers alone cant do without the beneficiaries
- Many stakeholders should be educated to enable them participate in formulation and implementation of CDM projects
- Engineers to come up, with a list of potential & CDM projects in different sectors
- Engineers to be involved in project development and to be committed in a number of PINs and PDDs
- Engineers to be involved in implementing CDM projects to enhance Tanzania environment and the world as a whole
- Encourage the business community to venture in viable CDM projects if possible with minimum dependence from outside
- The website should be highly publicized so that many people can participate in the process
- Prepare PINs of projects that have been identified jointly with w/shop participants
- NEMC and DNA to collaborate in identifying CDM projects

## How do participants think they may be involved in the CDM process in Tanzania?

- Check UNFCCC /CDM website for more information
- To partner with any foreign consultant in any stage of development of CDM projects
- Development of PIN/PDD
- As consultant as well as CDM project implementation
- Interested in DOE – (Eng. Msowoya)
- Through developing CDM project, reading, sharing information related to CDM projects and getting more involved in more CDM workshops to get more insight in the project
- Writing a proposal and indicate how the environment will be protected
- Being responsible for the protection of the environment
- Promoting CDM process by using my knowledge in industrial field
- Preparation of baseline information and project proposals, projects implementation and introducing the CDM process to other people (engineers and other professionals)
- Identification of the areas that are source of GHG in Zanzibar
- I will participate in rural electrification and energy management/efficiency in industries as I did 3 years ago (ikungu@gmail.com 0754889740)
- Implementing my project idea which I have for quite long time.
- Would prefer to participate in another workshop
- Suggest areas where CDM projects are viable
- I can support this process through online publication because this is my line of profession
- I am going to organize a seminar for CET in which DNA will be called to address the participants

## Closing of the workshop

The chairperson Eng. S. N. A Kassera appreciated the way the workshop was organized and therefore thanked the organizers for that matter. He promised that he would be responsive to any subsequent measures/arrangements which would be made to initiate CDM project. However, he noted that cooperation was highly needed in this endeavour.

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