Potential of Kyoto Protocol Clean Development Mechanism in Transfer of Energy Technologies to Developing Countries

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OBJECTIVES OF THE PRESENTATION

- ⇨ To illustrate the potential influence of Kyoto Protocol Financial Mechanisms on Energy Planning and Energy Technology Transfer in Developing Countries.
- ⇨ To show potentials of assumed rules of Clean Development Mechanism (CDM) on influencing future CO_2 emission.
- ⇨ To illustrate the cases of:
  - ❖ Small Island Developing State – Cape Verde;
  - ❖ Least Developing Country - Mozambique.

CONTENTS

- The United Nations Framework Convention on Climate Change and the Kyoto Protocol.
- The current status of the negotiation process.
- The Kyoto Protocol Flexible Mechanisms.
- The Clean Development Mechanism.
- The strategy to implement CDM in Developing Countries:
  - Small Island Developing Country special case: Cape Verde, Islands of Santo Antão and Santiago;
  - Least Developed Country special case: Mozambique, South-Eastern Africa.
- Conclusions - CDM: where to go from here.

THE CLEAN DEVELOPMENT MECHANISM (CDM)

- Is an effective tool for the promotion of sustainable development.
- Is designed to minimise significantly the cost of achieving Kyoto objectives, because:
  - It allows Annex I countries to invest in emission-saving projects in Developing Countries and gain credit for the savings achieved through the generation of Certified Emission Reductions for the compliance of their commitments.

THE ROLE OF CDM

- To help UNFCCC Annex I Parties to fulfil the Kyoto targets.
- To promote Annex I investment opportunities.
- To enable Annex I industries to disseminate clean technologies in Developing Countries.
- To attract the interest of investors, banks, private sectors and donors.
- To raise public awareness for the successful implementation of the Kyoto requirements.

CDM - HOW TO GET THERE?

- The Kyoto Protocol says little about how CDM should be designed and implemented- a number of functions will need to be performed:
  - International Functions:
    - Certification of CDM eligible project activities;
    - Emissions additionality and baseline setting;
    - Quantification, certification and pricing of ERUs;
    - Assistance for funding for certified projects;
    - System to track ERU trades;
    - Protecting vulnerable players.
  - National Functions:
    - Domestic monitoring and verification of baselines;
    - Registration of third-party certification entities
    - Certification of projects;
    - Setting national or sectoral emissions inventories.

CoP6-bis DECISION 5CP.6
CLEARING THE WAY FOR CDM

- CDM projects must be host country driven.
- Refrain nuclear energy initiatives for CDM.
- Public funding for CDM must be different from O.D.A.
- Urge prompt start for CDM, CDM Executive Board must be elected at CoP7 – 1 member for each regional U.N. group, 2 for Annex I, 2 for Non-Annex I, 1 for SIDS.
- Urge Executive Board to develop simple modalities and procedures for small-scale CDM projects for CoP8 - maximum capacity for renewable energy projects up to 15 MW, for energy efficiency improvement up to 15 GWh/yr, other projects that reduce CO_2 and direct emit less than 15 ktC/yr.
- Afforestation and reforestation are only eligible LULUCF projects for first commitment period.

CoP6-bis DECISION 5CP.6
ADDITIONALITY UNDER CDM

PROJECTS

- ⇨ TECHNOLOGICAL UPGRADING AND IMPROVEMENT (increases in energy efficiency).
- ⇨ INTRODUCTION OF STATE-OF-THE ART TECHNOLOGIES.
- ⇨ CURRENT ACTIVITIES ENCOURAGED BY GOVERNMENT INCENTIVES AND SUBSIDIES (under CDM these subsidies should not be provided).

PROFITABILITY: it is necessary to determine if project is fully profitable in the absence of CDM.

CoP6-bis DECISION 5CP.6
EQUITY FOR CDM

Rapidly industrialised countries show greater potential for emission reduction and for CDM investment.However, projects and investment must be fairly distributed among regions.

HOW TO GET EQUITY?

⇨ Quota-base system involving all developing countries, including SIDS;

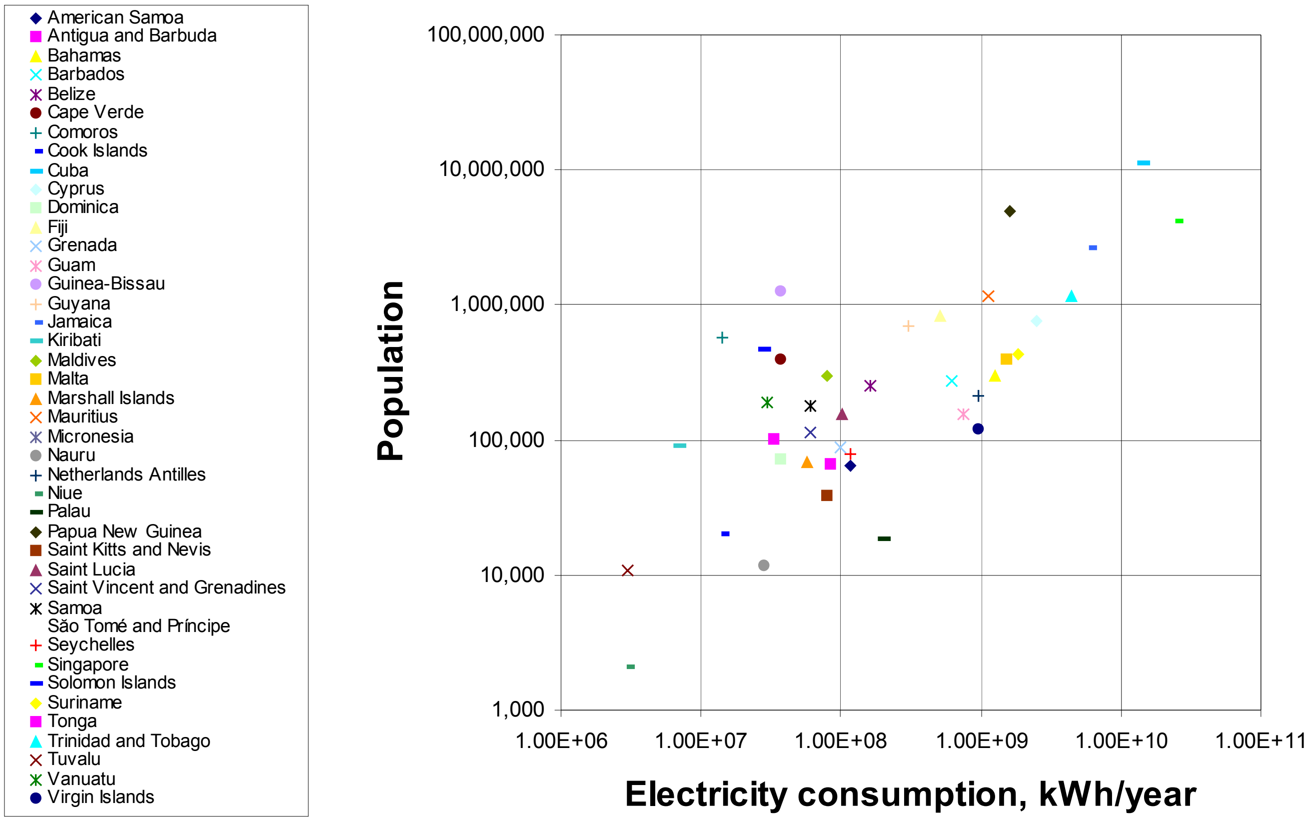
⇨ Extra credit and other benefits for projects implemented in very low income per capita countries;

⇨ Share of proceeds for adaptation.

CAPACITY BUILDING

- Identification and removal of institutional and other barriers.
- Creation of a framework for CDM implementation.
- Elaboration of a methodology to assess CDM project direct benefits and co-benefits.
- Identification of a methodology for mapping CDM potential.
- Identification of potential CDM projects.
- Elaboration of pre-feasibility studies on potential CDM project impacts.

THE SMALL ISLAND DEVELOPING STATES

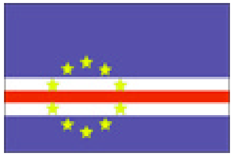


Distribution of SIDS according to population and electricity consumption

THE CAPE VERDE ISLANDS

SMALL ISLAND SPECIAL CASE

- ⇨ High price of small scale fossil fuel technology (diesel).
- ⇨ Possible competitiveness of renewable energy.
  - ⇨ **Cape Verde**



- ⇨ Wind as competitive energy source in electricity production (8% of total).
- ⇨ High dependency on diesel in electricity production.

CASE: SANTIAGO
OBJECTIVES

- To show the particular case of the most populated island of Cape Verde - Santiago.

- To show the potentials of assumed rules of CDM on influencing future CO_2 emissions.

- To show the potentials for investment into RET and supply side energy efficiency technologies.

Electricity production - island of Santiago

Case for CDM

2000-2030

Scenario 1: Business as usual* – mainly Diesel
Scenario 2: 30% Wind energy
Scenario 3: Combined cycle + 30% Wind energy
Scenario 4: as scenario 2 with declining prices of RET
Scenario 5: as scenario 3 with declining prices of RET

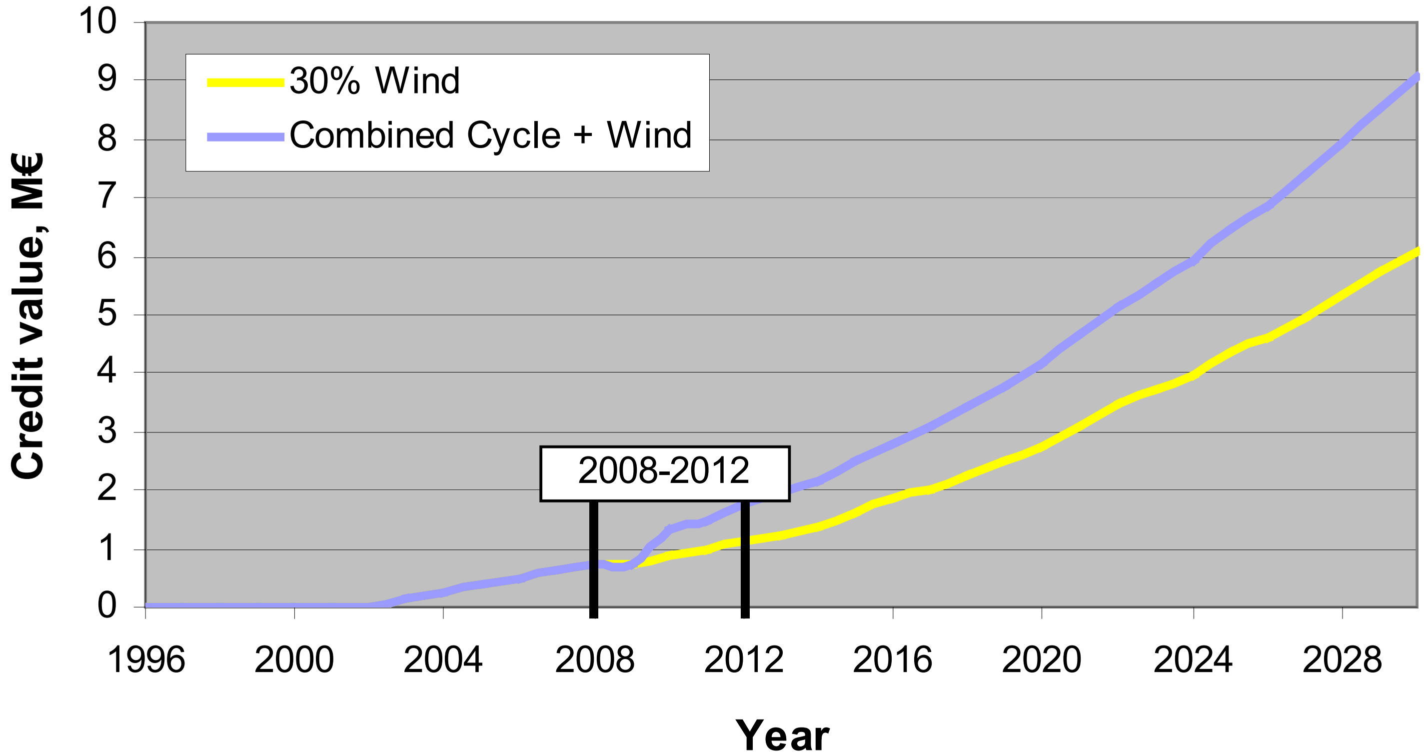
* based on study by Michel Patou: Programme de développement à moyen terme du sous-secteur de l'électricité géré par l'entreprise publique d'électricité et d'eau ELECTRA, Ministère de la coordination économique, République du Cap Verte, 1997

CASE: SANTIAGO

The island of Santiago, Cape Verde

Santiago	scenario	2000	2010	2030
Population		236000	293000	436000
Electricity penetration		51%	64%	91%
Production [GWh]		70	521	1100
Load peak [MW]		10.6	33	204
Installed capacity [MW]	BAU	18 D +0.9 W	50 D +2.7 W	263 D
	30% Wind		50 D +20 W	256 D +118 W
	Combined cycle + 30% Wind		43 D +10 CC +20 W	190 D +70 CC +118 W

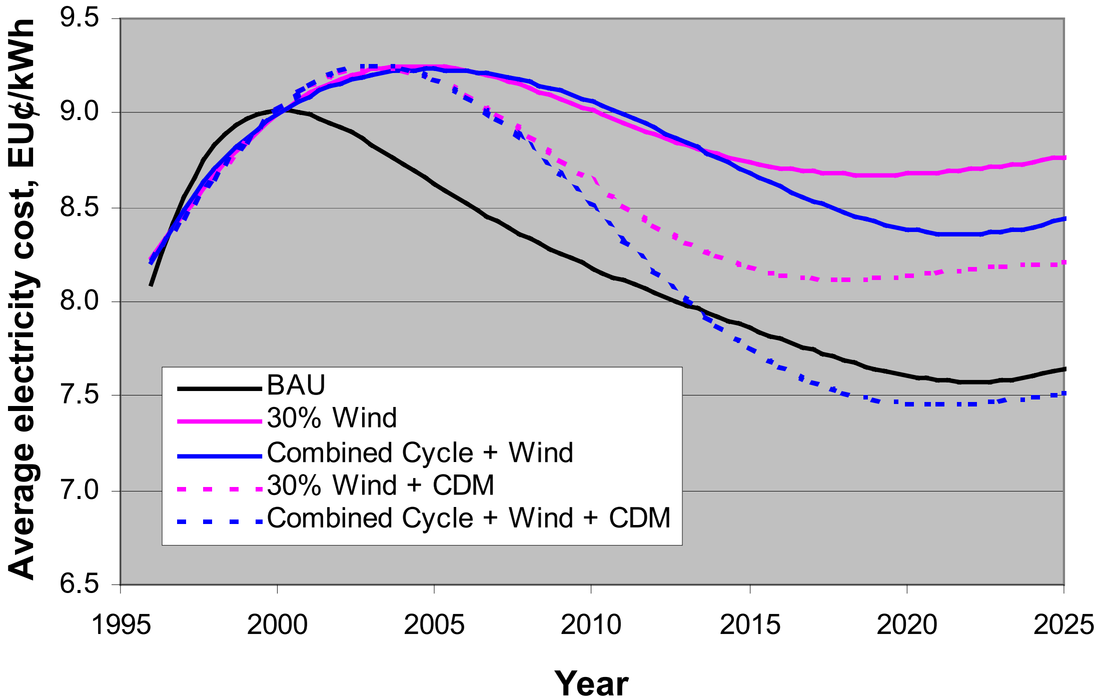
CASE: SANTIAGO



Potential CDM value

(based on OECD study that concluded that in case of emission trading the price of CO_2 reduction is 25 USD/t CO_2)

CASE: SANTIAGO



- Santiago - wind is not viable with current costs
- Combined cycle will be viable later
- CDM could help wind to become viable

Comparison of average electricity production price (1999 €)

Scenarios 1-3: Possible influence of CDM

CASE: SANTIAGO CONCLUSIONS

- CDM could help reduce CO_2 emissions from electricity production to half baseline value.
- GHG reduction potential from business as usual scenario baseline.
- Financial and environmental additionality.
- Contribution to the host country's sustainable development needs.
- Opportunity for RET vendors and CDM investors.

MOZAMBIQUE

Mozambique
International boundary
Province boundary
National capital
Province capital
Railroad
Road
Lambert Conformal Conic Projection, SP 6S/30S
TANZANIA
ZAMBIA
MALAWI
ZIMBABWE
SOUTH AFRICA
BOTSWANA
SWAZILAND
ZAIRE
NIASSA
CABO DELGADO
NAMPULA
TETE
ZAMBEZIA
MANICA
SOFALA
INHAMBANE
GAZA
MAPUTO
Mozambique Channel
INDIAN OCEAN
Maputo
Beira
Lusaka
Harare
Lilongwe
Pretoria

MOZAMBIQUE SPECIAL CASE

- ⇨ Sparse population, large distances, low energy consumption, rich in resources - decentralised or integrated electricity system.

- ⇨ High price of small scale fossil fuel technology (diesel).

Mozambique 

- ⇨ Competitiveness of large hydro energy.

- ⇨ Large hydro potential installed - 90% for export.

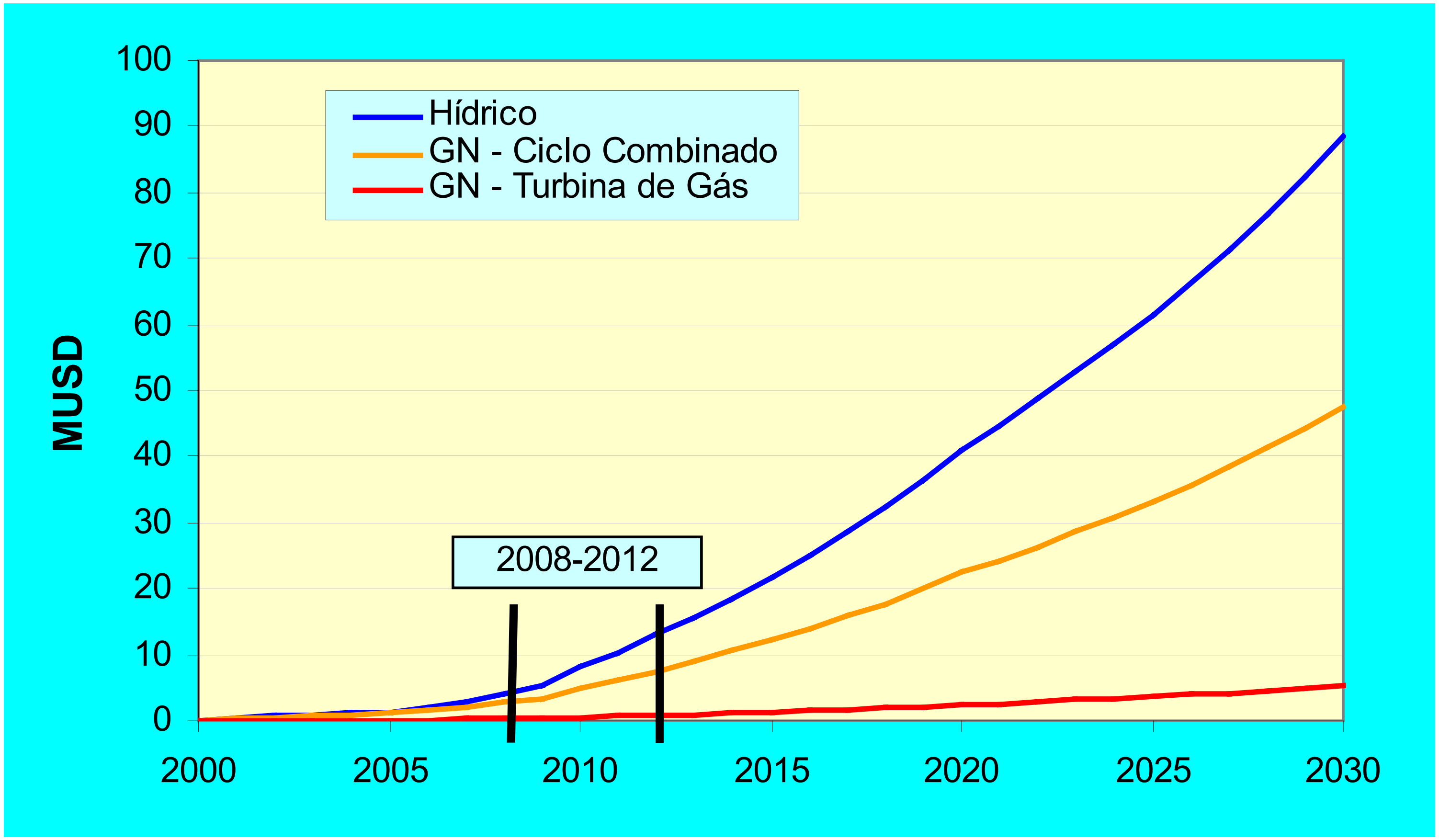
Electricity production - Mozambique

Possible case for CDM

2000-2030

Scenario 1: Baseline – new power mainly Diesel
Scenario 2: Natural gas – new power mainly GT or ST
Scenario 3: Natural gas – new power mainly CC
Scenario 4: Hydro - new power mainly coming from HPP

CASE: MOZAMBIQUE



Potential CDM value (15 USD/tCO2): comparison of scenarios to the baseline - GT, CC, hydro

CASE: MOZAMBIQUE
CONCLUSIONS

- ⇨ Energy Planning methodology combined with consequences of the Kyoto Protocol were presented on the example of Mozambique.
- ⇨ Additional advantage of integrated electricity system is higher share of cleaner energy technologies (CC + hydro) and the CDM potential.
- ⇨ It is important for Mozambique that large Hydro be included in CDM.
- ⇨ It is important for Mozambique that CDM does not include financial additionality condition.
- ⇨ In case of using Natural Gas from the CDM point of view advantage is on Combined Cycle technology.
- ⇨ Financial potential in CDM for energy projects.

CDM - WHERE TO GO FROM HERE

CDM is about:

- ENVIRONMENT, because it allows non-Annex I Parties to contribute to Kyoto objectives and assist Annex I Parties in meeting their emission limitation commitments;
- DEVELOPMENT, because it assist non-Annex I Parties in achieving sustainable development and in contributing to the ultimate objective of the UNFCCC;
- ECONOMY, because CDM projects create emission reduction units (ERUs) which can be purchased by Annex I Parties to contribute to their compliance with their emissions limitation obligations under the Protocol - CDM lowers compliance costs.

CONCLUSIONS

Examples illustrated that:

- ⇨ Energy Planning should be done taking into account CDM.
- ⇨ CDM could convert a non-viable project in the energy sector into one with economic viability.
- ⇨ Large GHG reduction potential in Developing Countries.
- ⇨ Opportunity for RET vendors and CDM investors.
- ⇨ Contribution to the host country's sustainable development needs.