



# CDM Business Opportunities for Cogeneration Projects

**2004 Cogeneration Day in Lao PDR**

12 October 2004 Lane Xang Hotel, Vientiane

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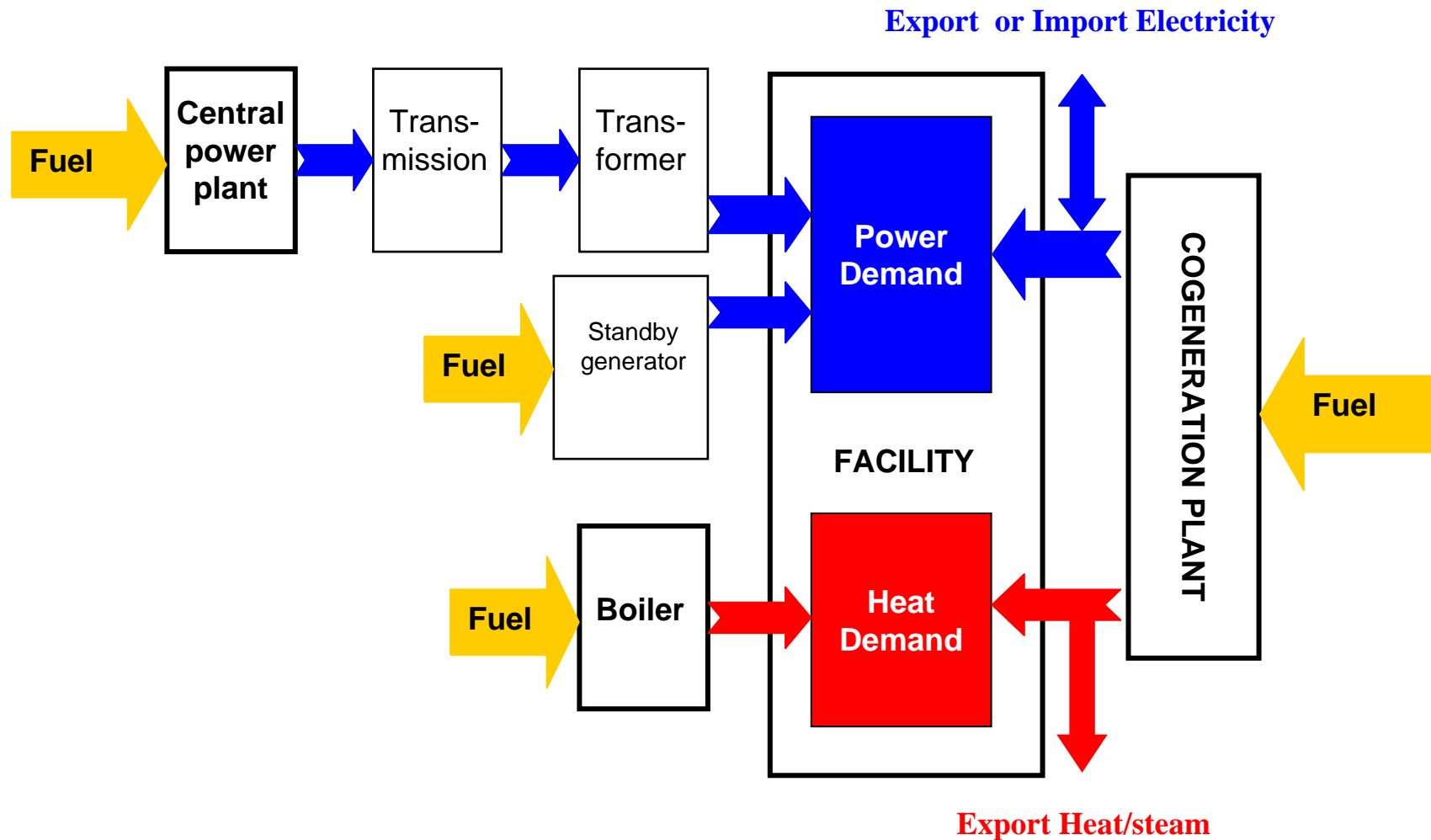


# What is Cogeneration?

- Sequential generation of **two different forms of useful energy** using a **single primary energy source**
- Most usual:
  - electrical (or mechanical)
  - thermal: **heating** or **cooling**



# What is Cogeneration?



## Conventional Power Generation vs Cogeneration

### Conventional system



### Cogeneration system





# Greenhouse Gas Effect

- Mainly caused by CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O in the atmosphere.
- The so-called "greenhouse gases" trap more heat in the form of infra-red radiation emitted by earth (heat from the sun), so it gradually warms up more than it should.
- Consequences
  - Sea level rise and flooding in coastal areas
  - Climate extremes and disasters
  - Human health problems



# Kyoto Protocol - Outcome

Three market based mechanisms

- Emission Trading (ET)
- Joint Implementation (JI)
- Clean Development Mechanism (CDM)



# Clean Development Mechanism (CDM)

## CDM can be defined as

a Mechanism under which developed (Annex I) countries can implement GHG mitigation projects in developing (Non-Annex I) countries to meet a part of their emission reduction commitment.

**Joint Implementation (JI)** has a similar definitions as CDM, but it will be operational within Annex I countries.



# Benefits to Developing Countries

- New source of foreign Investments
- Transfer of technology and expertise
- Employment generation
- Infrastructure development
- Reduction in imported energy demand



# Benefits to Developed Countries

- Reduction in emission mitigation costs
- More flexibility for meeting their commitment
- Market for new and advanced technologies
- New investment opportunities



## How CDM works?

If you are implementing a CDM project, which results in the **reduction of** CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission, then you will get a certificate for your emission reduction (**Certified Emission Reduction – CER**).

1 Unit CER = 1 ton of CO<sub>2</sub> equivalent mitigation

This CER can be sold in international market.

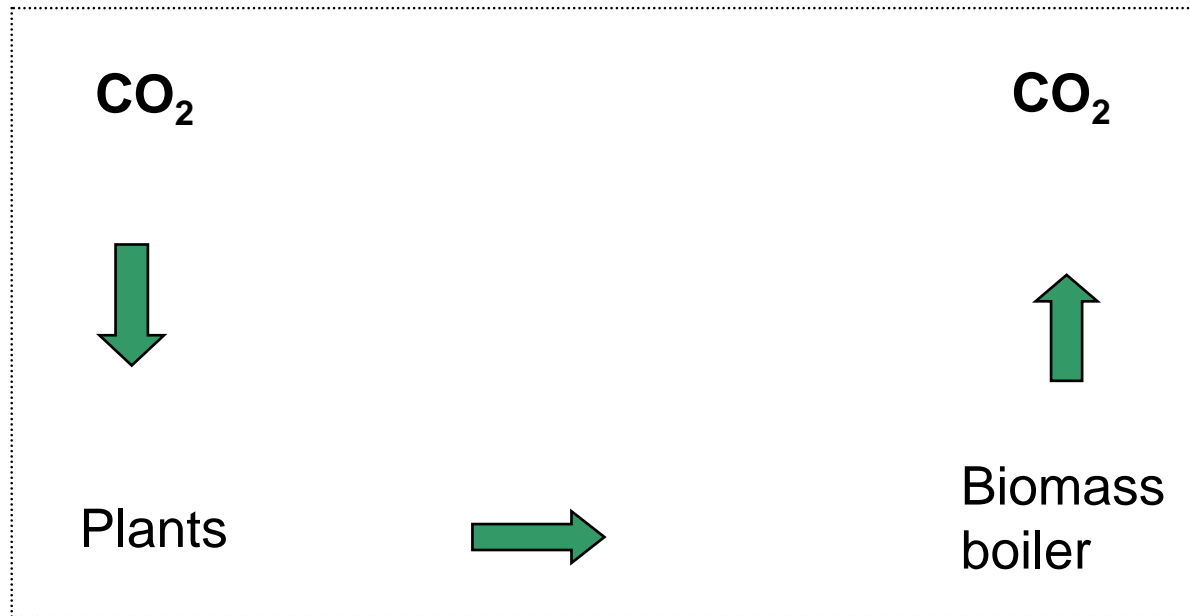


# Potential CDM Projects

- **Biomass cogeneration/power generation**
- **Biogas cogeneration/power generation**
- **Methane capture projects**
- Wind
- Geothermal
- Hydropower
- Fuel Switching
- Ethanol, biodiesel
- Efficiency, capacity upgrades

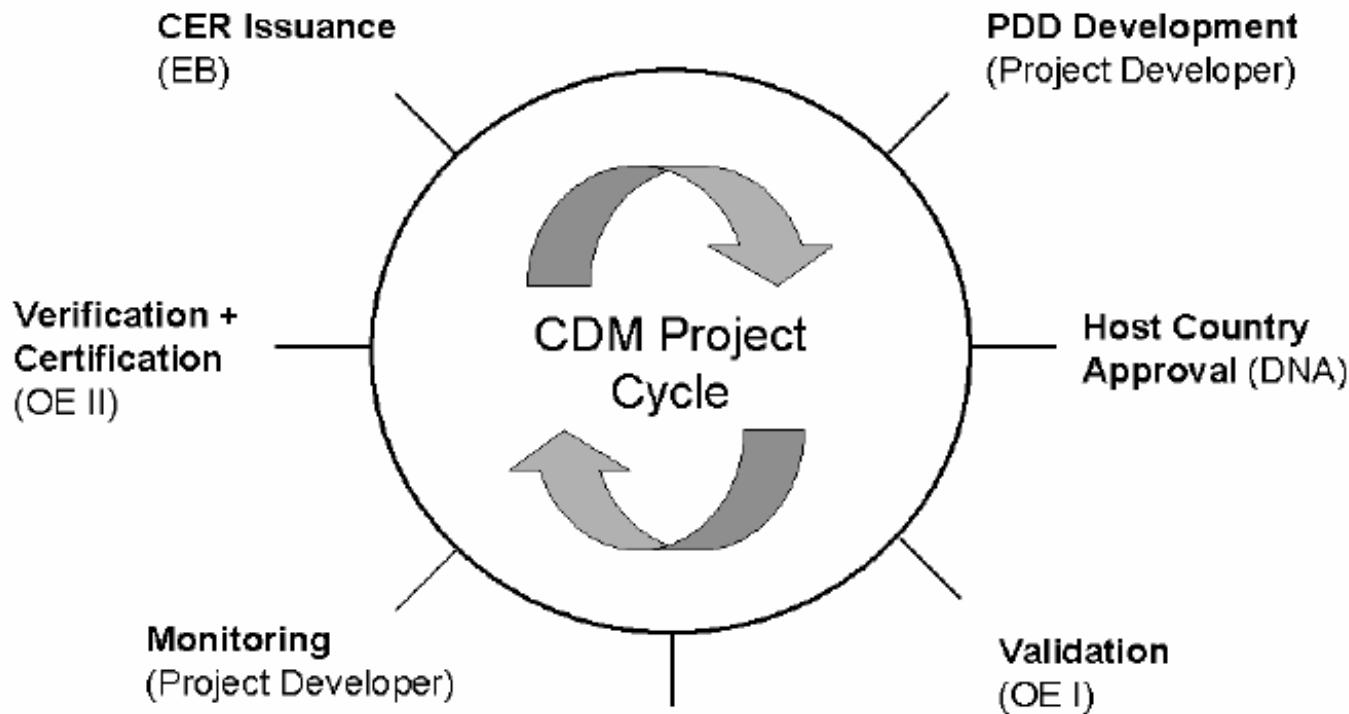


# Biomass: CO<sub>2</sub> neutral





# CDM Project Activity Cycle



**EB – CDM Executive Board**

**CER – Certified Emission Reduction**

**Registration (EB)**

**PDD – Project Design Document**

**DNA - Designated National Authority**

**OE – Designated Operational Entity (DOE)**



## Major Players in CDM

- Project developers
- PDD consultant (sometimes in-house)
- Validators (Designated Operational Entity - DOE)
- Designated National Authorities (DNA)
- CDM Executive Board (EB)
- CDM Methodology Panel
- Other consultants
- NGOs and interested public (local, international)
- CDM credit buyers
- Annex I and Non-Annex I Countries



# CDM Project Activity

- Propose a New Baseline and/or Monitoring Methodology
- Use the Approved Baseline and/or Monitoring Methodology
- Validate the CDM project activity
- Register the CDM project activity
- Certify/Verify the emission reductions (ERs) of a CDM project activity
- Request issuance of CERs related to a CDM project activity



# Project Design Document

- Additionality (not the business-as-usual project):  
baseline
- Approved baseline methodology (existing or new)
- Project boundary, leakage
- Emission reduction: emission without the project  
(baseline) - emission with the project
- Crediting period (fixed or renewable)
- Monitoring, verification methodology and plan
- Environmental impact assessment
- Stakeholder consultation and action for comments
- Contribution to sustainable development
- Host country criteria



# Host country approval

- Sustainable development
- Host country criteria
- Country preferences
- Host country's letter of approval
- Credit sharing ???



# Validation

- Independent third party assessment on project's baseline, monitoring plan and compliance (UNFCCC + host country)
- Completeness of PDD documentation
- Use of approved methodologies, host country acceptance
- Project activities additional to business-as-usual
- Project results in emission reductions relative to the baseline
- Environmental and social performance
- Monitoring plan: quality assurance of data collection, recording
- Local stakeholder consultation
- International stakeholder consultation and action
- If validation is positive, will be recommended for registration



# Monitoring, verification and certification

- Data collection by Project Managers as specified in the monitoring plan
- Changes to the monitoring plan need to be approved by a Validating Operational Entity
- Verification: periodic independent review of the monitored reductions
- Definition of the verification protocol
- Verification of data, report and technical review resulting in issue of verification opinion by the verifier
- The Verifier “certifies in writing” the number of avoided emissions and submits a Certification Report to the CDM EB
- CDM EB issue the certificate



# Small Scale CDM Project - Definition

- Renewable energy project up to 15 MW.
- Energy efficiency improvement project activities which reduce energy consumption by up to the equivalent of 15 GWh per year.
- Other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kt CO<sub>2</sub> equivalent per year.



# Development Cost

- Initial evaluation
- PDD
- Validation
- Registration
- DNA approval
- Monitoring cost
- Operating cost (transparency, documentation)
- Approximately 100,000 – 250,000 USD



## CDM Credits – Market Price

- Current transaction – 3 to 5 USD
- Few small projects managed to get higher price
- Few buyers willing to buy high quality CERs at higher price (small projects)
- High price expectation in 2008



# Business Opportunities

- Additional revenue from CDM credits
- Higher visibility for the project
- New investors for the project
- Green image
- New, improved technology
- Professionalism in the project development and implementation
- Better risk management



# Risks in the CDM Projects

- Kyoto Protocol not yet ratified
- High development cost (not feasible for small projects)
- Long development period (sometimes damaging to the project)
- Low CER price (limited buyers of CER at present)
- Future price uncertain (Demand and supply not clearly known)
- CDM is not increasing the project IRR considerably



## Recommendation

- Plan for CDM in the early stage of project development
- Good scheduling, so that CDM and project development/implementation can go together
- Give more attention for the baseline
- Avoid over estimation of CDM credits
- Give more attention host country criteria
- Involve experienced consultants
- Take calculated risk, if you can



For more information,  
please visit COGEN 3 Website at:

<http://www.cogen3.net>

**Thank You !**