Lessons from e7 Bhutan Micro Hydro Power CDM Project

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Renewable Energy & Sustainable Development

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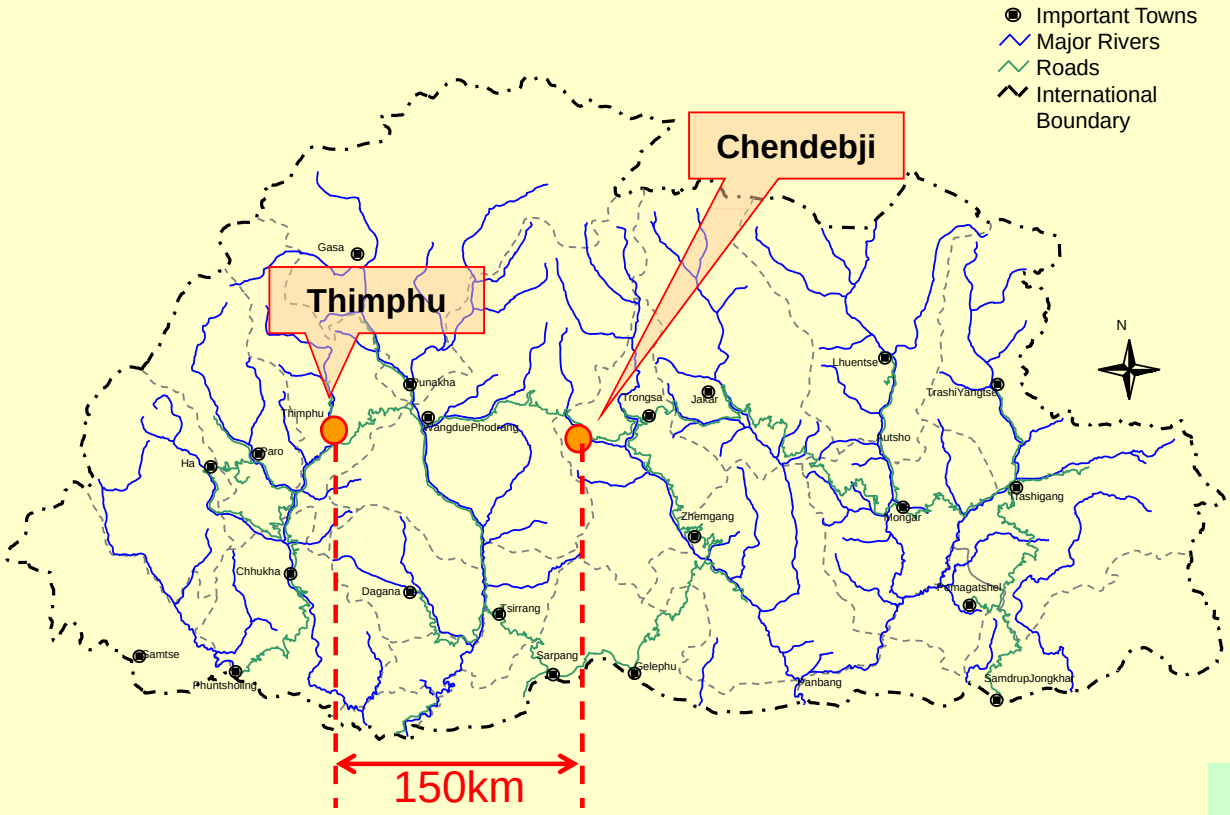
Location of Bhutan

Chendebji



Objectives of the Project

- To demonstrate the first project under the Clean Development Mechanism (CDM) based on a micro hydropower station
- To construct a micro hydropower station in a remote village in Bhutan to support Rural Electrification
- To contribute to the CDM rule-making process by presenting the problems encountered and corrective measures taken

History of the Project

2001/11: Pre-feasibility Study conducted for a micro hydropower station.

2002/11: Feasibility Study conducted. The e7 Fund and the Bhutan government concluded an MoU.

2003/ 6: Government of Japan, as Annex I country, approved the project as a CDM.

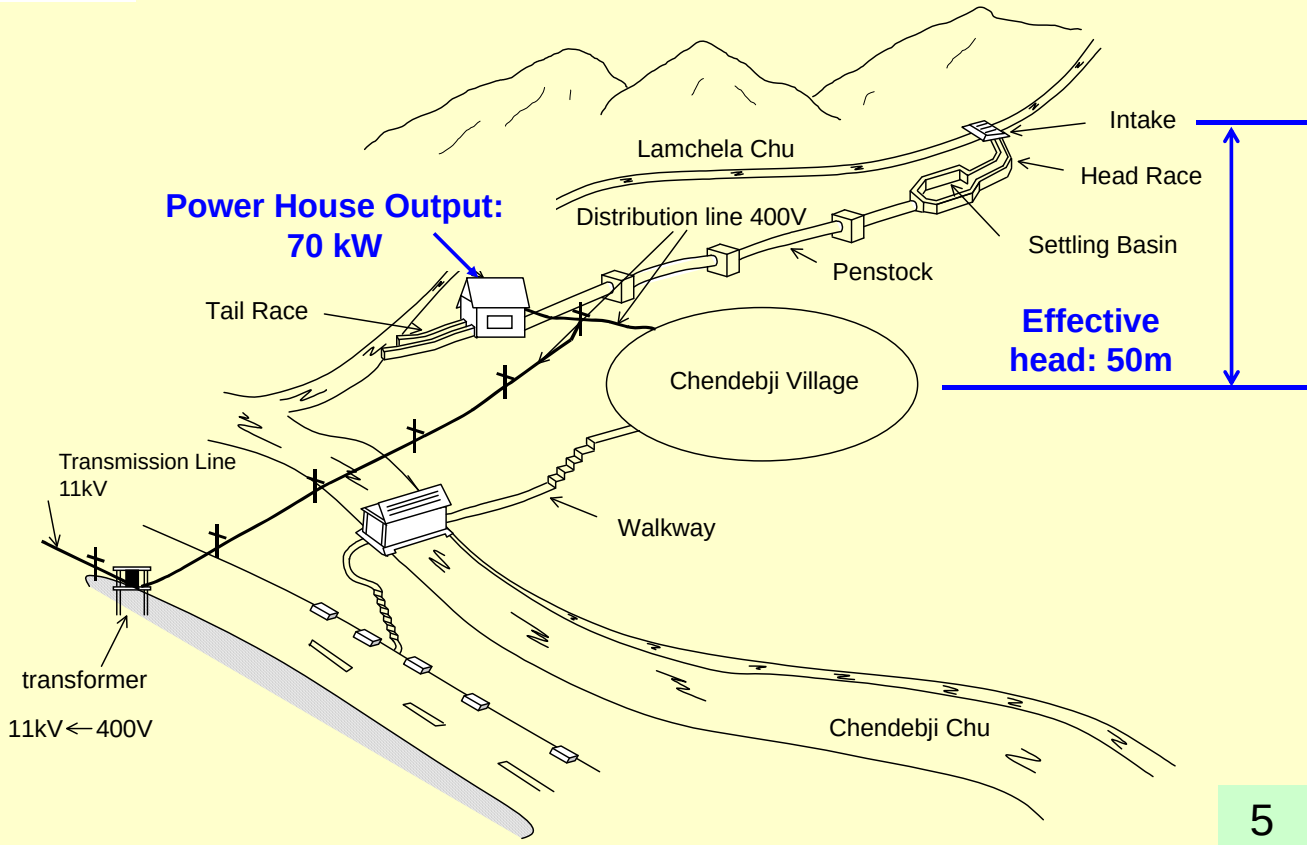
2004/ 2: Government of Bhutan approved the project as CDM project as host country (Non Annex I country).

2005/ 5: Project was registered as a CDM project by UNFCCC.

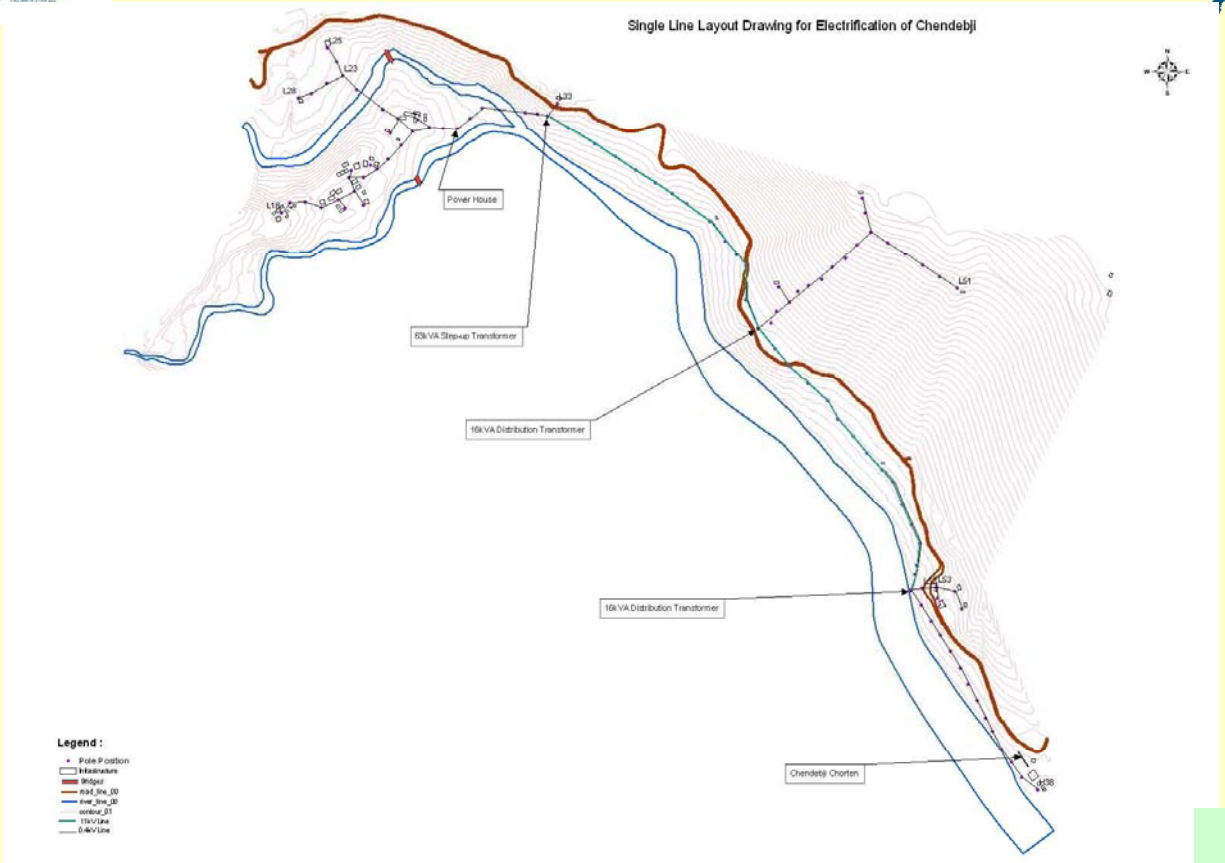
2005/ 8: Project began generating electricity.

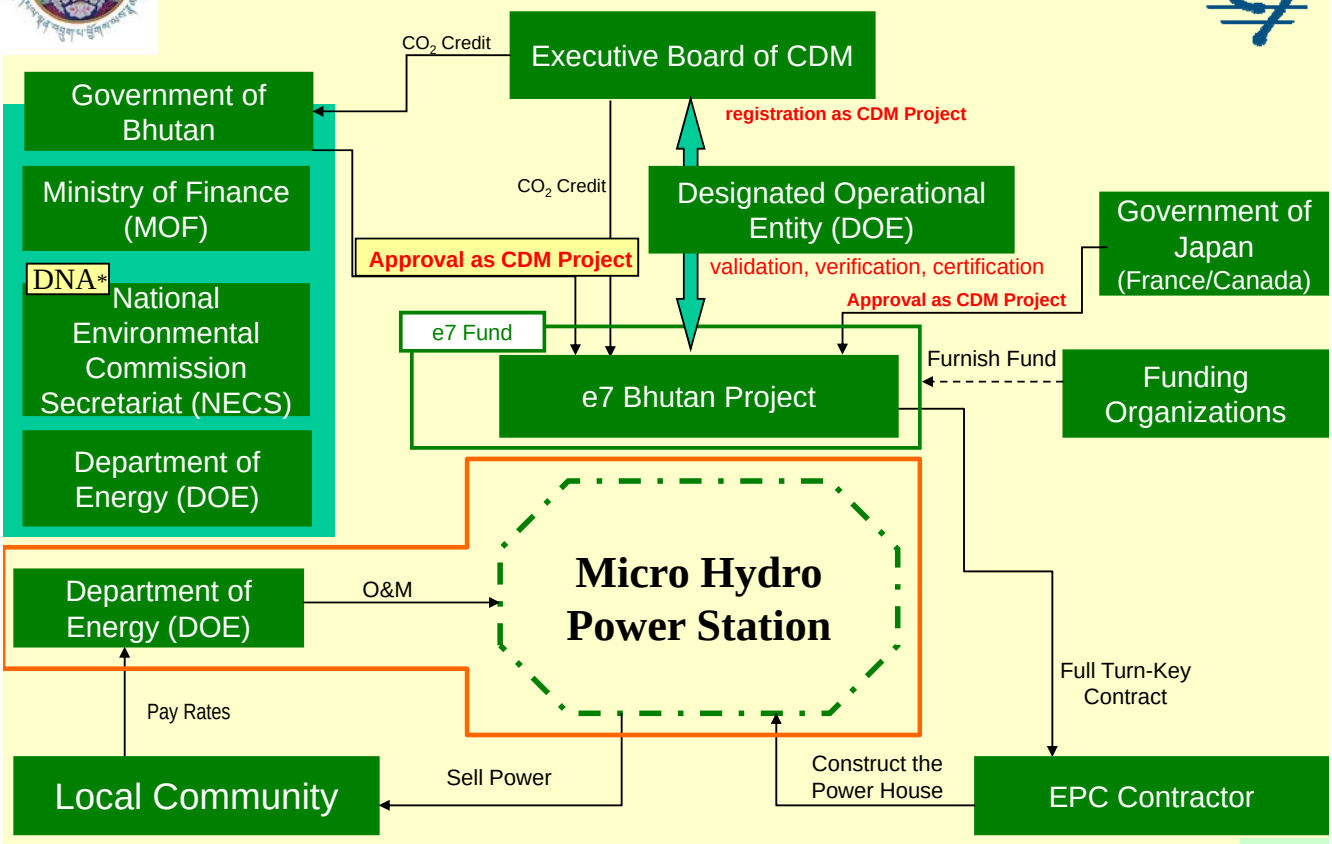
2007/ 9: Two years monitoring finished

Outlined Map of Project Site

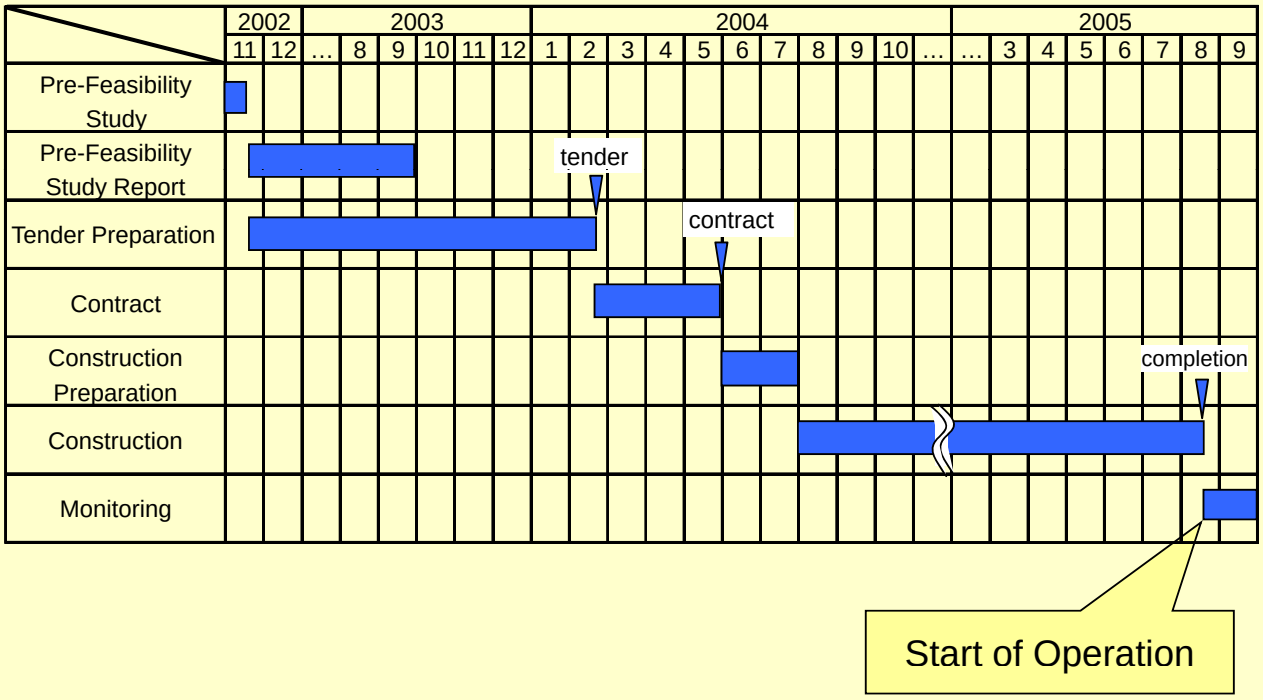


Chendebji_Electrification_Map





*DNA:Designated National Authority (Focal Point)



Project beneficiary (Chendebji)

Power House

Electricity Generator (Alternator)

- Maximum operating water: 0.2m^3/s
- Rated output: 70 kW
- Expected annual generation: 582,540 kWh
- Expected Annual CER generation: 500t-CO_2/year for 21 years

Penstock

Intake

Distribution Lines

Public Consultation

Studying under Kerosene Lamps
(in absence of electricity – before project)

Dining under Electricity (after project)

Lessons Learnt by Host Party

- Bhutan is grateful to e8 for selecting Bhutan as host country to pilot its first CDM project
- For successful implementation of CDM project, the Annex I party and the host country should have a very friendly and long standing relationship (The Bhutan-e8 relationship dates back to 1998)
- For pilot projects, the smaller the size, the better because it does not cost much when problems are encountered; we now have more confidence for going into larger CDM projects although certain rules still need to be clarified

Lessons Learnt by Host Party (cont.)

- Strong, CDM conversant and proactive DNA is essential for successful implementation of CDM project
- Adequate CDM awareness among policy/decision makers is necessary for timely approval of the CDM project by the host government
- Easy to justify CDM project if there is sufficient evidence of CDM benefits
- A basic CDM lesson: preparing the PDD is not easy, the DOE would like to verify everything in the PDD before the validation report is issued

Lessons Learnt by Host Party (cont.)

- Stakeholders, especially local ones, need to be well informed of climate change and related impacts
- Involvement of all stakeholders, especially the community directly affected by the project, from planning through to operation, is essential and helps the community take ownership of the project
- Host party should understand all relevant laws and regulations in the host country in order to avoid delay during project implementation

Lessons Learnt by Host Party (cont.)

- Sustainable Development is real and measurable
- Examples of progress in the few months since the project was completed:
  - new restaurant and new shop (economic sustainability)
  - students perform relatively better in studies
  - increase in local CDM capacity (social sustainability)
  - community buys less kerosene for lighting (environment sustainability)
- Close cooperation and proper technology transfer to local counterparts is essential for long term sustainability

Lessons Learnt by e8

Project Selection

- Simplified Small-Scale CDM (SSC) process benefits project developers by allowing faster and easier completion of the entire process than with normal scale CDM

- Cooperation with and involvement of the host country greatly facilitates the CDM process

Lessons Learnt by e8 (cont.)

Rural Electrification Project

- Easy to justify 'additionality' because of project's financial barrier.

- Emissions reductions from Rural Electrification projects are too small to cover CDM-related costs. Not attractive for investors.

→ Need more incentives. e.g. Use of public funds?

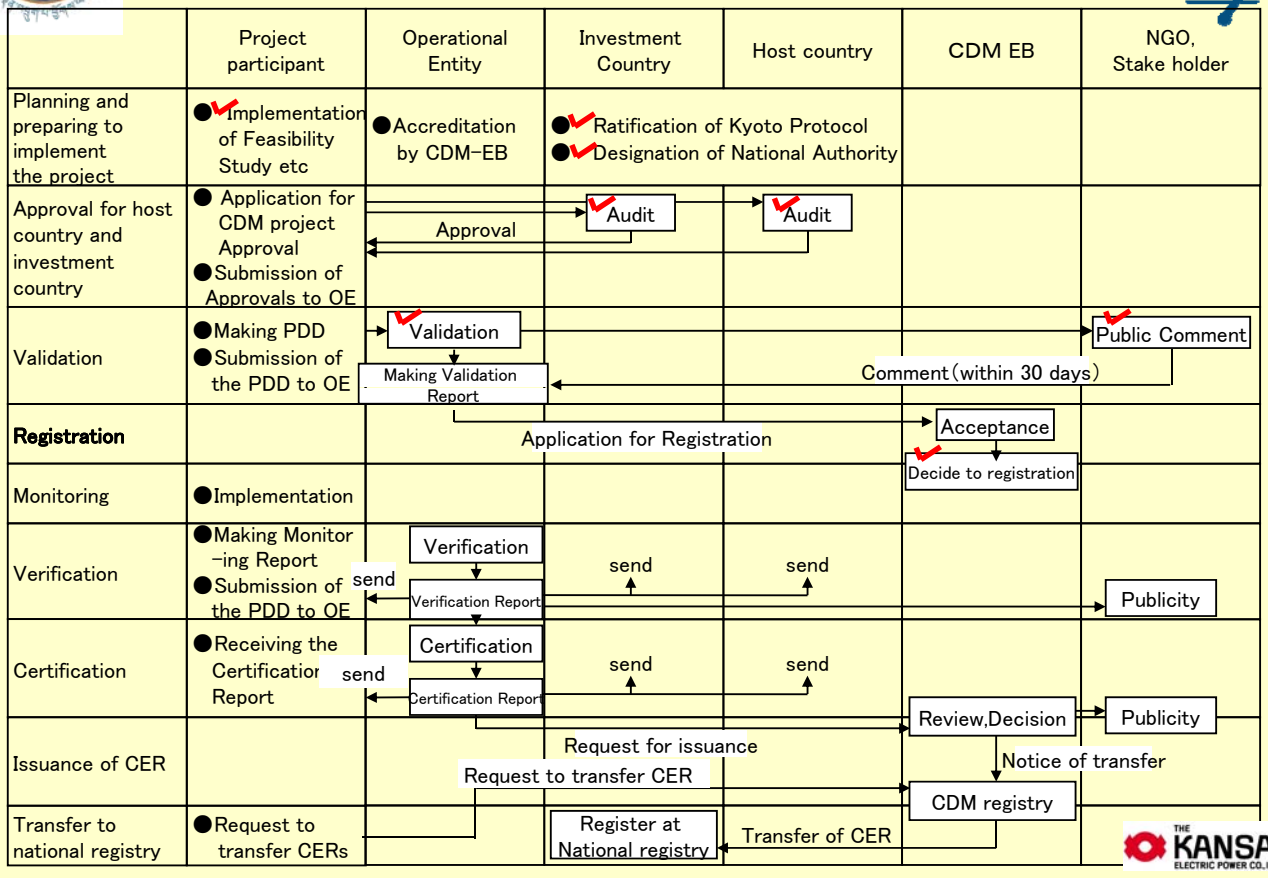
Lessons Learnt by e8 (cont.)

Transaction Costs for SSC project

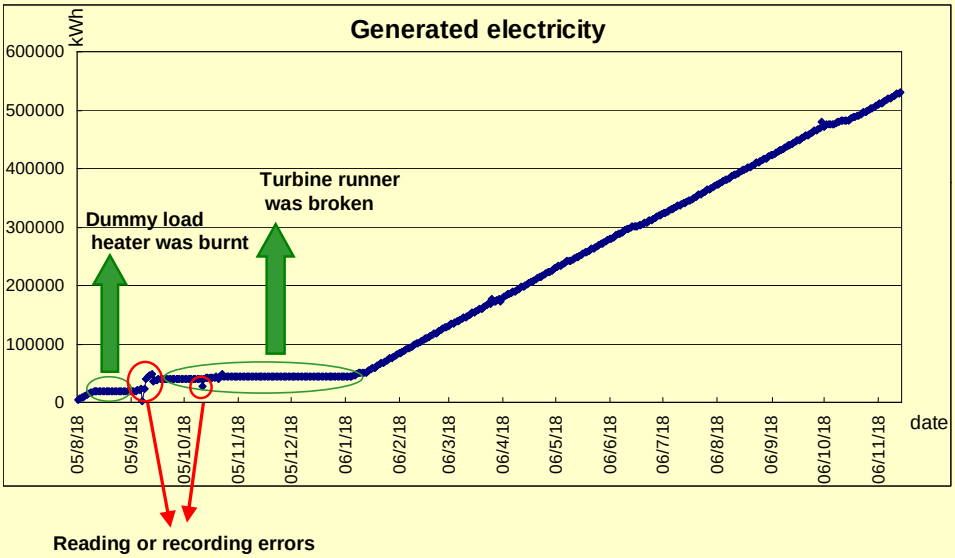
- To encourage 'Micro Hydro' Scale CDM projects, and despite the reduction in the high $5,000 registration fee, Monitoring, Verification and Certification procedures should be simplified or skipped to reduce transaction costs.

→ *Need for some 'bail out' measures!*

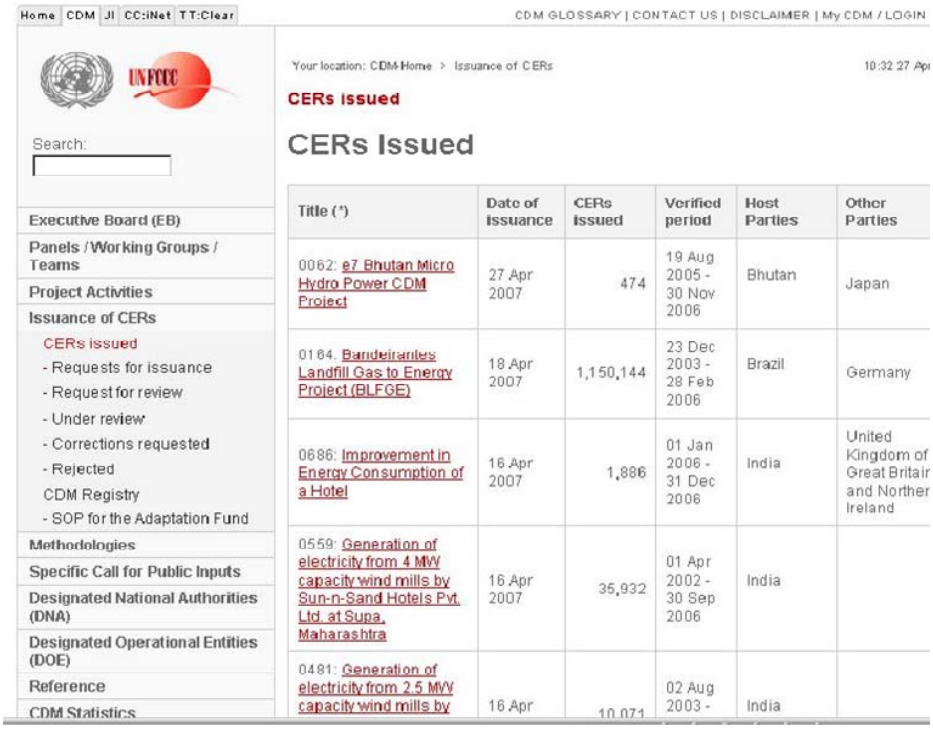
Flow of CDM Approval



Result of Monitoring



- There were some troubles on mechanical and operation at initial stage.
- In spite of some initial troubles, the power station is operating smoothly.



Thank you for your kind attention!

For more information:

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