



# Lessons from e7 Bhutan Micro Hydro Power CDM Project

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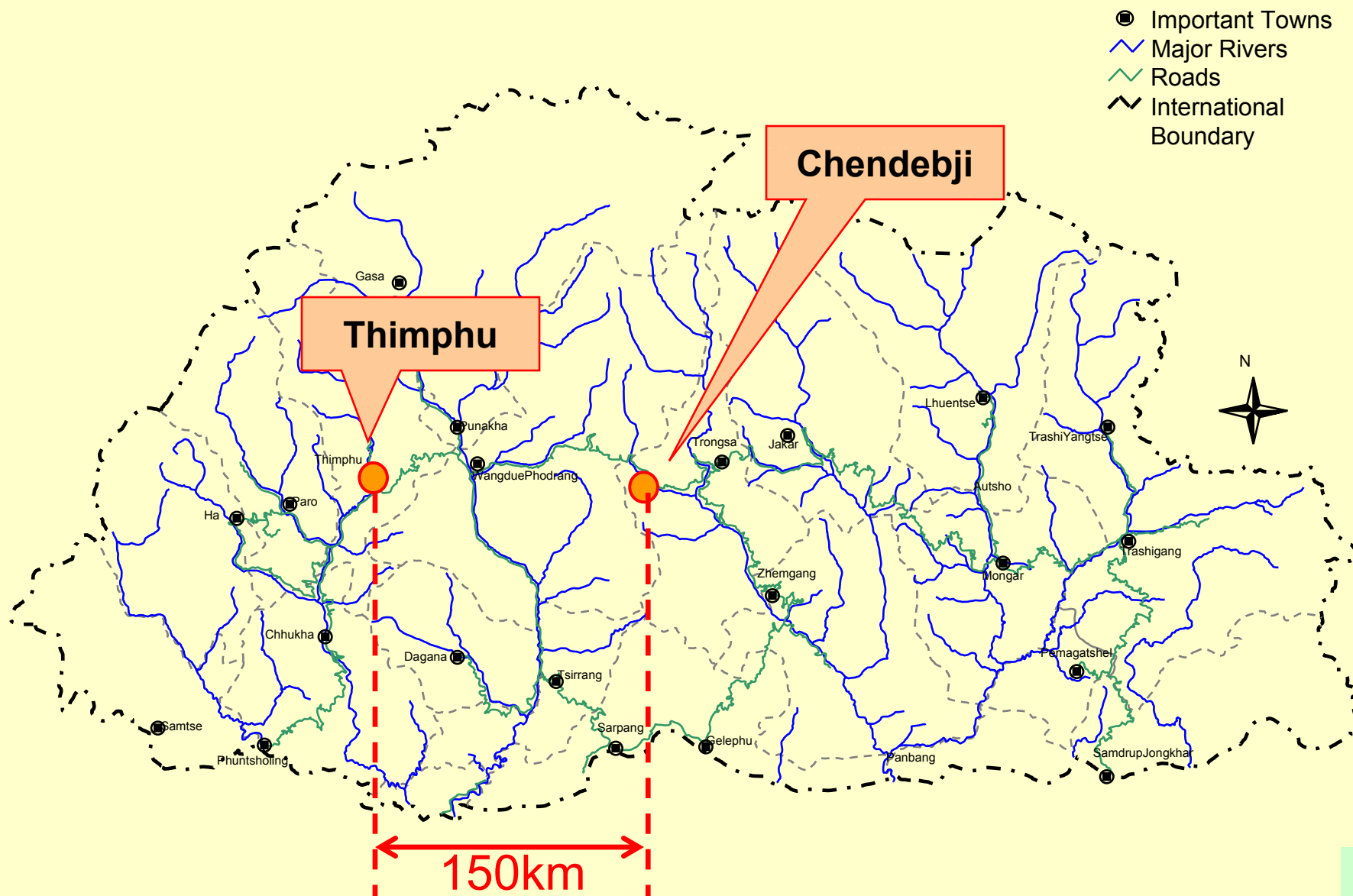


# Location of Bhutan





# 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



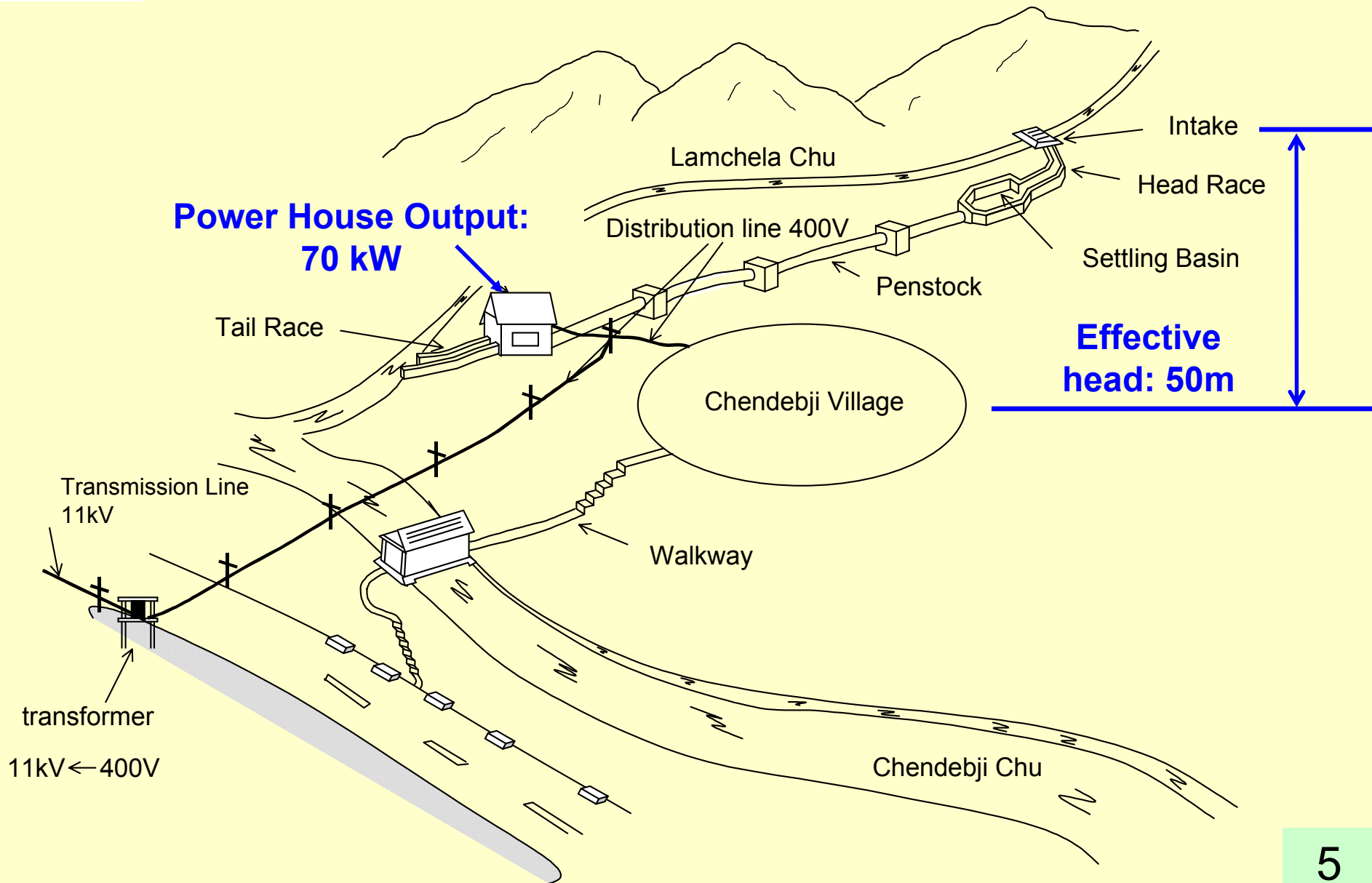
- 2001/11: Pre-feasibility Study conducted for a micro hydropower station.
- 2002/11: Feasibility Study conducted. The e7 Fund and the Bhutan government concluded an MoU.
- 2003/ 7 : Government of Japan, as Annex I country, approved the project as a CDM.
- 2004/ 2 : Government of Bhutan approved the 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.



# Outlined Map of Project Site



**Power House Output:  
70 kW**







# Project beneficiary (Chendebji)







# Power House







# Electricity Generator (Alternator)



- Maximum operating water:  $0.2\text{m}^3/\text{s}$
- Expected annual generation: 582,540 kWh
- Expected Annual CER generation:  $500\text{t-CO}_2/\text{year}$  for 21 years







# Penstock







# Intake







# Distribution Lines







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





# Dining under Electricity (after project)





# Lessons Learnt by Host Party



- Bhutan is grateful to e7 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-e7 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 AE/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)



## Project Selection

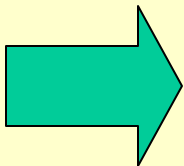
- Close cooperation and proper technology transfer to local counterparts is essential for long term sustainability
- Simplified Small-Scale CDM (SSC) process benefits project developers by allowing faster and easier completion of the entire process than with normal scale CDM
- Cooperation with and involvement of the host country greatly facilitates the CDM process



## 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?





## Selection of the DOE

- If the project is validated by the Applicant Entity (AE), it takes more time and money during the accreditation process

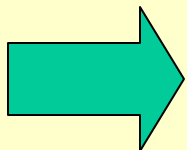


- CDM Accreditation Panel should prepare detailed guidelines for accreditation process for transparency and efficiency.
- Using SSC project for the Accreditation may be wise choice for AE because of its simplified procedure.



### 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!*



*Thank you for your kind attention!*

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