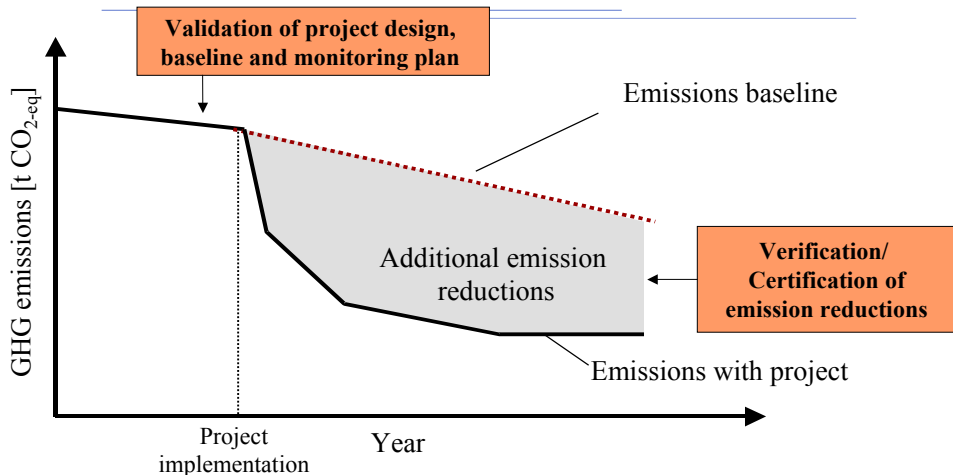


## CDM for R&M of Thermal Power Plants: Status and Issues

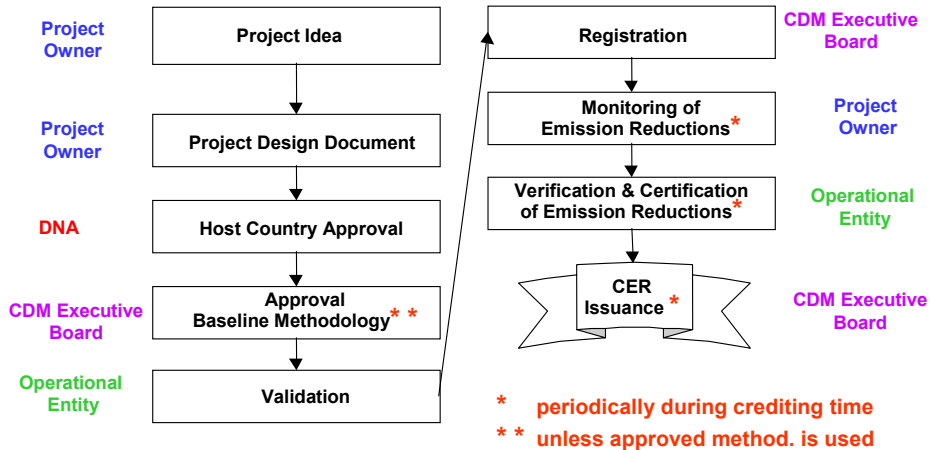
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## Baseline and Additionality of CDM Projects



# CDM Project Cycle: Steps towards certified emission reductions (CERs)



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# Methodologies for R&M / Retrofit of Power Plants



- Currently, no approved methodology for R&M in place
- No methodology has been proposed to date

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## Gas turbines: Conversion from single to combined cycle

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- Approved methodology in place (ACM 007)
    - Originally developed for a project in Bolivia
  - So far no registered project
  - Applicable also in India
- ➔ Is conversion to combined cycle being considered?

## CDM for Renovation and Modernization: Badarpur TPS as example

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- NTPC is planning R&M of BTPS Units 4&5 (210 MW)
  - Currently preparing tender documents
  - Aspiring CDM benefit
- CDM-India was tasked to support the CDM registration
  - PIN was prepared
  - CDM methodology and PDD is under development

## CDM for Renovation and Modernization: Critical Elements

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### Key Requirements (as for any CDM project)

- Project must be additional
- Project must use approved CDM methodology:
  - Baseline methodology
  - Monitoring methodology

## Additionality

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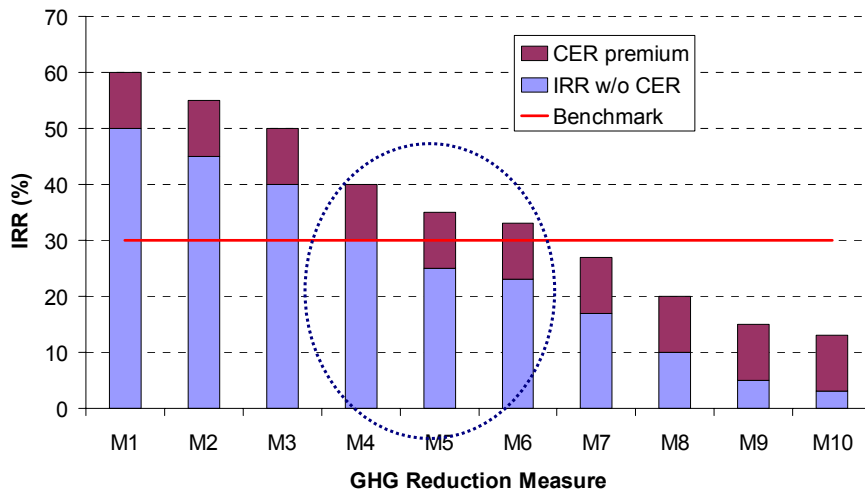


- CDM is an **incentive** to achieve **additional** emission reductions
- CDM is **NOT a reward** for past or BAU emission reductions
- A project activity (and the resulting emission reductions) is **additional if it is not the baseline scenario**
  - i.e., the project activity should not occur “anyway”
- Goal is to **make projects happen** which without CDM revenues would not be viable.

## Additionality: critical elements for R & M

- R&M is **happening** in India. How are plants chosen?
  - NTPC plan until 2017!
  - End of **technical life**/ “codal life”?
  - **Lowest PLF**?
- What is **done** in the plant?
  - Series of measures **above IRR threshold**?
  - Measures that are “**typical**” and allow to use full budget allocated?

## Impact of Carbon Revenue on IRR: Key Indicator for Additionality



## Issues for R&M Methodology

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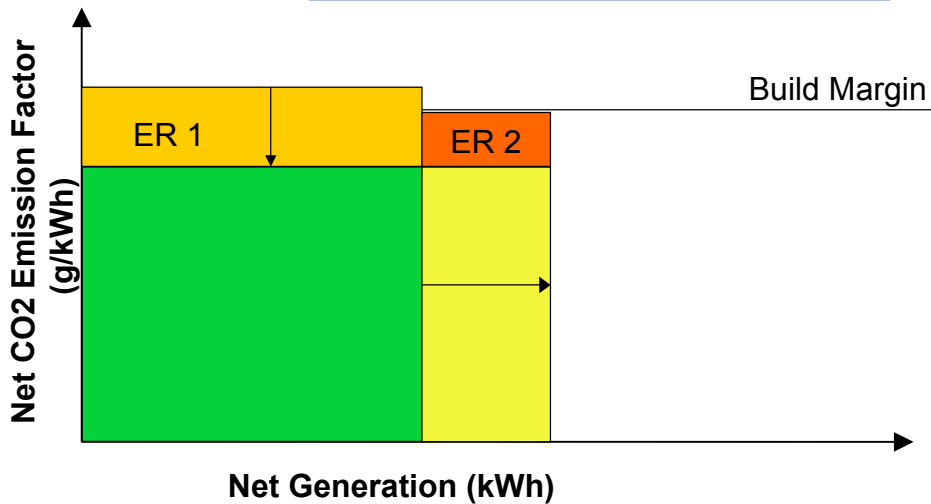
- Getting CDM benefit for all measures may be difficult because of **additionality** requirement
- CDM benefit only for a **subset of measures** requires:
  - Breakdown of energy savings for each measure
  - More detailed monitoring
- Even **monitoring of overall plant efficiency** is not trivial
- **Capacity expansion** due to R&M creates special problems

## Badarpur TPS Example: Thermo-Dynamical Modelling Tools

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- Modelling with “Epsilon” tool for Badarpur R&M ongoing
- Possible uses:
- Determine **pre-R&M** efficiency of **station + components**
  - Project **post-R&M** efficiency of **station + components**
  - **On-line monitoring** of actual post-R&M performance
- Sophisticated modelling + monitoring probably **indispensable** for accurate quantification of emission reductions

## Impact of CDM Project on CO2 Emissions: Role of Changes in Net Generation



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## Outlook



- Work on Badarpur R&M pilot case will continue
  - Completion (registration) in mid-2007 at earliest
- Other R&M projects can be pursued concurrently
- Badarpur methodology, once approved, can be applied to other R&M projects
- Badarpur methodology will not be “compulsory”
  - Other methodologies may be developed
  - E.g. looking at R&M programs instead of single projects

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## Take-Home Message

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- When planning R&M for a project, obtain competent view on eligibility for CDM
  - Usually, pursuing CDM will be worthwhile
- When considering the financial viability of individual measures within R&M:  
Account for **CDM benefit** for **measures “on the margin”**

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**Thank you!**  
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