

# Carbon Financing Options for Methane Recovery Projects

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# Outline

- Global warming due to methane
- Methane emission sources
- Financial considerations in methane capture
- Carbon finance: What? Why? How?
- Kyoto mechanisms; CDM in particular
- Current issues in CDM projects



# Methane – A highly Potent GHG

- Methane has a GWP of 21 (23 as per IPCC Third Assessment report) i.e. it is 21 times as potent as CO<sub>2</sub>
- Contributes 10-12% among the six GHGs, towards current global warming on a worldwide basis but 31% in India\* (India's first Natcom)
- It is emitted from both natural as well as anthropogenic activities

# Methane emission sources

- Agriculture
  - Rice fields
  - Enteric fermentation in cattle
  - Putrefying biomass
- Industrial
  - Distilleries, breweries
  - Wastewater from cattle/pig farms, dairies, slaughterhouses
  - Degrading solid waste from food processing industries
  - Fugitive emissions from natural gas fields, pipelines
- Urban
  - Solid waste dumpsites, sanitary landfills, sewage treatment plants
- Mines
  - Coal mine/bed methane
  - Solid rock mines



# Regulatory/financial considerations

- Methane not considered a pollutant and therefore not regulated
- Not much financial incentive to capture / destroy the methane unless generated in large quantity
- Reliable technology for capture and use/flare in some cases not available to the users

Bottom line – Need some financial incentive for implementing the methane recovery projects

**Carbon finance is one of the alternatives!**



# Carbon Finance What? Why? How?

- What? - Finance from sale of market based instruments generated by commoditizing environmental performance over business-as-usual
- Why? – to enhance the performance, feasibility of the clean technologies and incentivize them over BAU
- How? – Current regime operates under the compliance market and a small voluntary market. Compliance market driven by Kyoto Protocol CDM and JI and EU-ETS
- Kyoto Protocol – A cap & trade mechanism which recognizes common but differentiated responsibilities of developed and developing nations
- KP entered into force on 16 February 2005 and first commitment period began on 01 January 2008

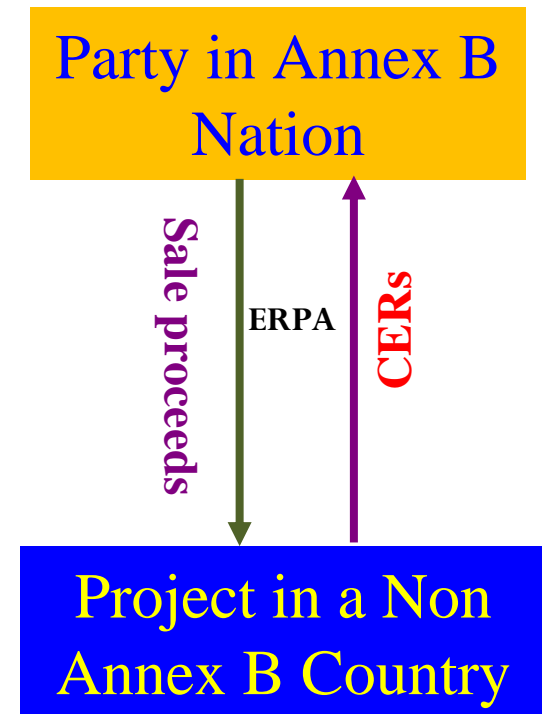
# Kyoto Mechanisms

- Joint Implementation (JI) – between two industrialized nations\*
- **Clean Development Mechanism (CDM)** – between a developing and an industrialized nation
- International Emission Trading (IET)
- CDM is most relevant for India

\*Included in Annex I of the UNFCCC with targets inscribed in Annex B of the KP

# What Is CDM?

- A mechanism to enable Annex I parties to “purchase” GHG emission reduction from projects in developing nations
- An instrument **Certified Emission Reduction** (CER), 1 ton of CO<sub>2</sub> equivalent
- When a project activity in host country does better than “**Business as Usual**” scenario the emission reduction over that level is translated into CER
- The business as usual case is defined as **Baseline Scenario** approved by a regulator viz. CDM Executive Board (EB)
- CERs accrue each year after the project performance is “**verified**” through a pre approved monitoring plan

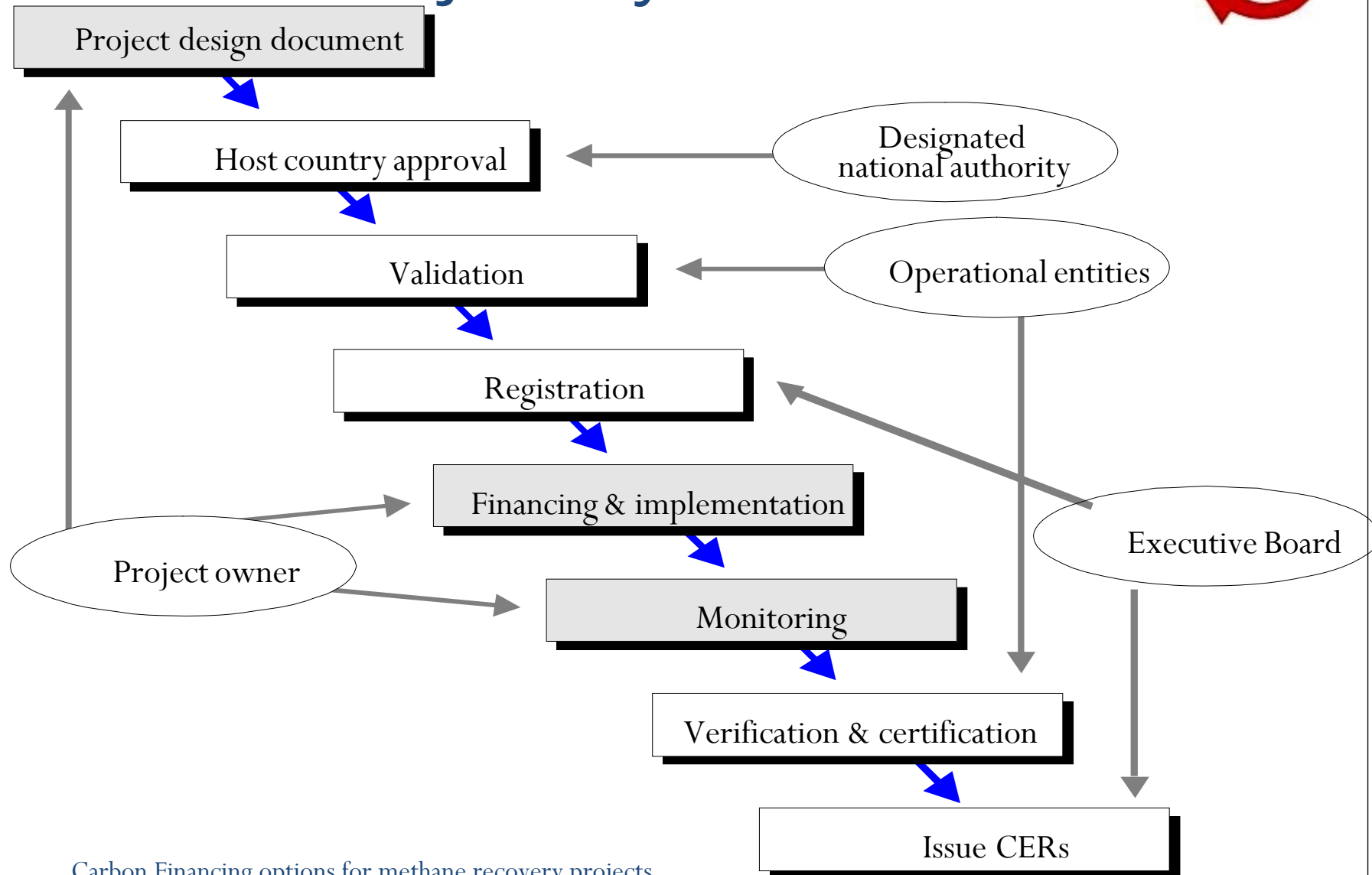


Annex B nation – Developed nations with emission reduction targets in Annex B of KP  
 Carbon Financing options for methane recovery projects





# CDM Project Cycle





# Some Key Requirements of CDM

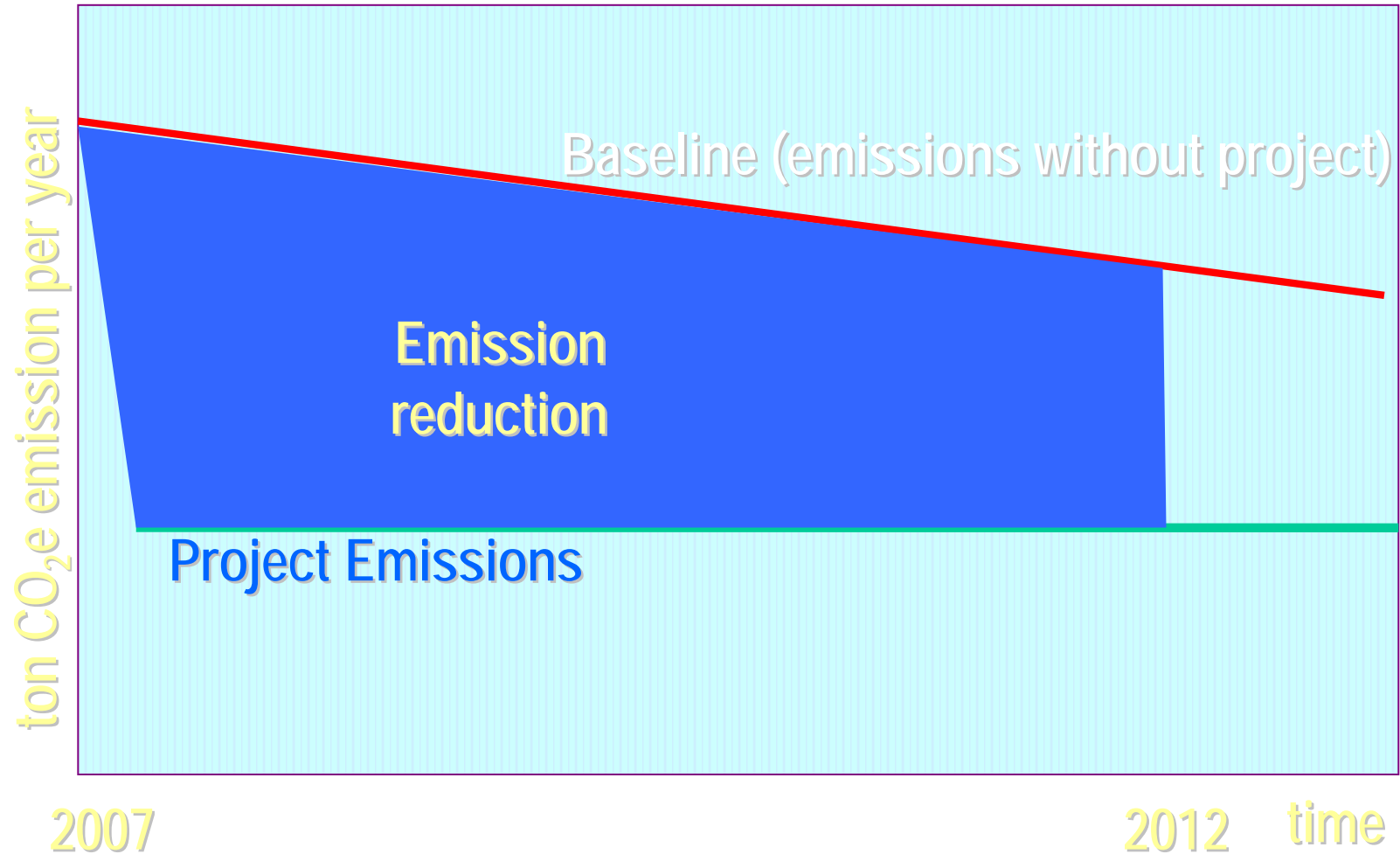
- **Baseline Methodology**
  - Identifies the most plausible “Baseline Scenario”
  - What would have happened in the absence of CDM project
- **Additionality**
  - Demonstrating prior Consideration of CDM in investment decision
  - Demonstrating that the project would not occur without CDM revenues
- **Emission reductions**
  - Real, Measurable and Verifiable by third party DOE
  - Defines how emission reductions are calculated
- **Host Country Approval**
  - Proof of meeting sustainable development requirements decided by the host country
- **Monitoring Plan**
  - Describes procedure and organizational set up for monitoring



# Key CDM Requirements...

- Due Consideration of Local stakeholders' Comments
  - Invited through interactions with identified concerned people
- Validation by DOE and Registration
- Verification/Certification by DOE
- Current crediting period is up to end of 2012 – Negotiations for next period have begun. Progress expected by COP 15 in 2009

# What is a Baseline?

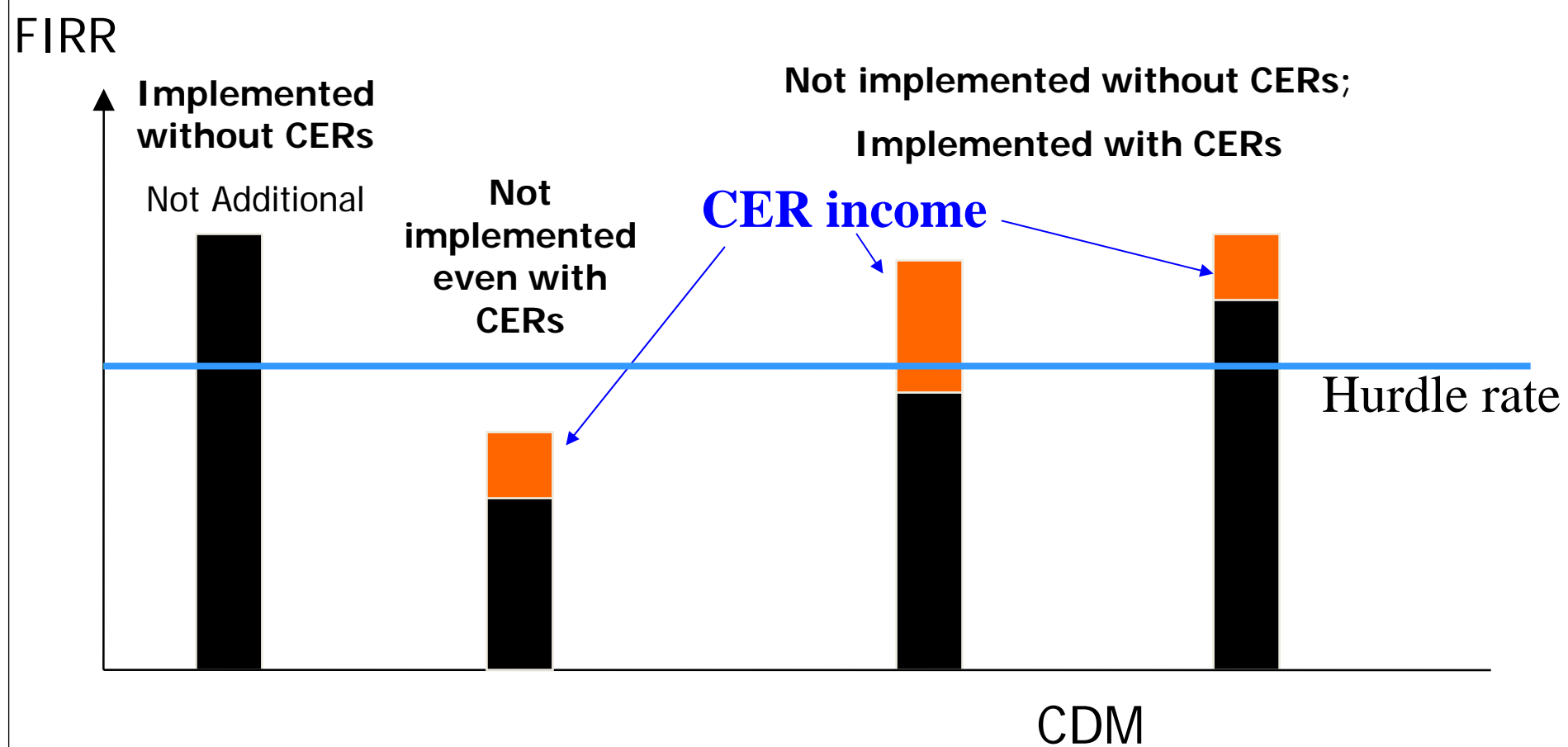




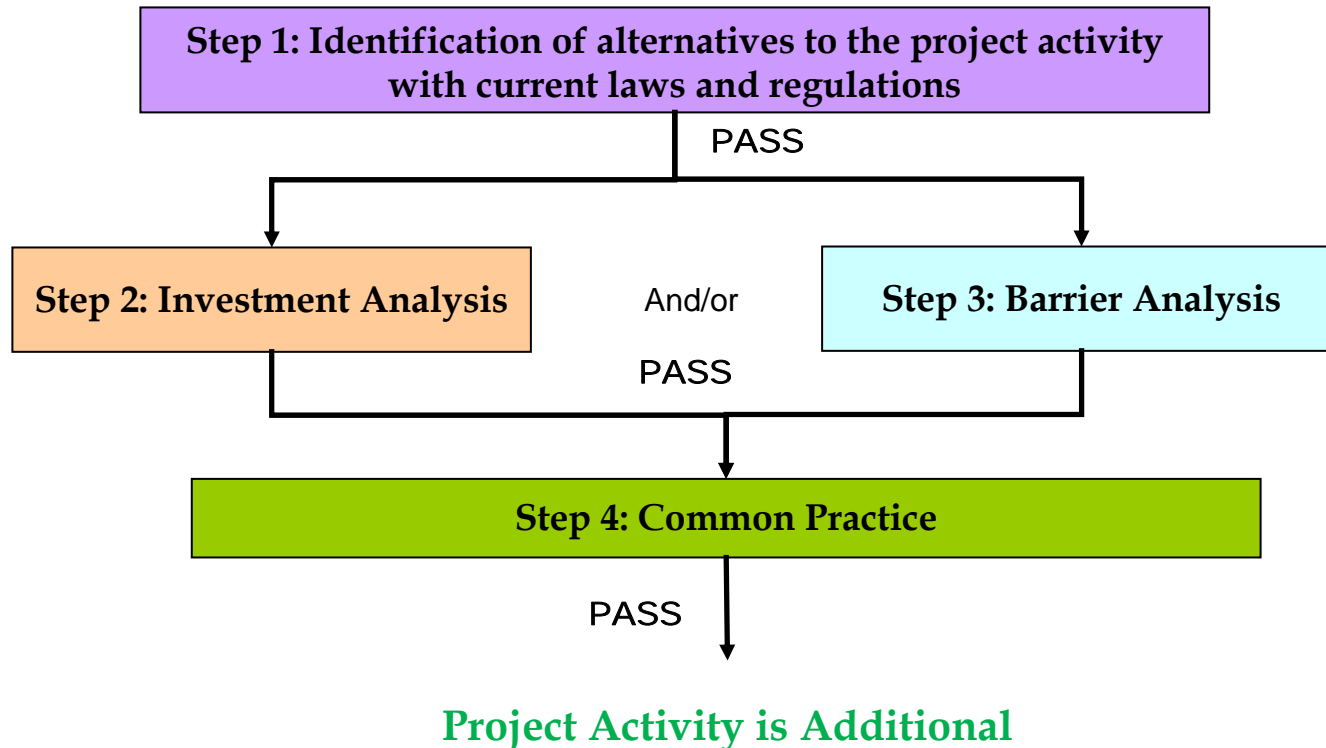
# Additionality

- Environmental
- Financial (or Investment)
- Technical
- Social and Economical
- Barrier removal

# Additionality Example

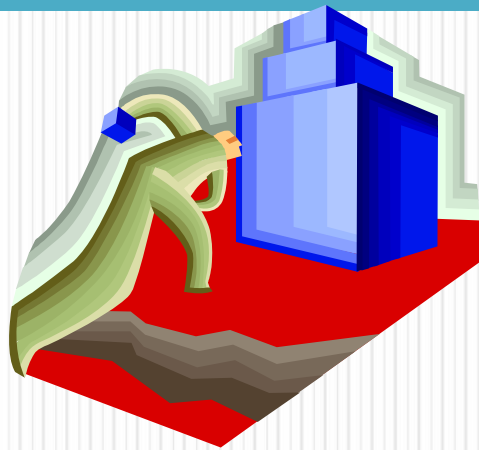


# Additionality Tool\*



\* Tool for demonstration and Assessment of Additionality

# Progress of Implementing CDM





# CDM Statistics

(Source UNFCCC website 11 Sept 2008)



	<b>Annual Average CERs <sup>1</sup></b>	<b>Expected CERs until end of 2012<sup>2</sup></b>
<b>CDM project pipeline: &gt; 3000 of which:</b>	N/A	>2,700,000,000
<b>1157 are registered (356 from India, 241 projects addressing methane)</b>	222,262,469	>1,300,000,000
<b>55 are requesting registration</b>	13,096,753	>50,000,000 *
<b>Issuance of CERs</b>	450 Number	186,070,451

**Expected annual average CERs for India: 31,072,495 (13.98% of world)**

**Issuance to Indian Projects 47,553,417 (25.55%)**

Assumptions: 1. All activities deliver simultaneously their expected annual average ERs 2. No renewal of crediting periods



# Other statistics

- Number of approved baseline methodologies
  - Large scale – 62 (AM 48 + ACM 14)
  - Small scale – 30
- Number of approved baseline methodologies addressing methane capture, avoidance, flare or use
  - Large scale – 15
  - Small scale – 9
- No. of accredited DOEs – 18
- EB Panels/Working Groups/Teams - 5

# Relevance to methane recovery projects



- Typically the methane capture and avoidance projects benefit from the “Methane kick”
- Avoiding or capturing 1 ton of methane is equivalent to 21 tons of CO<sub>2</sub>
- Additional benefits if the captured methane is used for heat or electricity generation
- IRR of Methane capture and flare projects have been observed to jump between 3-5% whereas those with heat/electricity generation by as much as 6%
- Drawback: the emission reductions calculated based on multiphase FOD models in actual performance exhibit around 20-30% less CERs

# Current issues with CDM Projects

- Vast changes have taken place in the 3 years since KP effectiveness
- More experience through Learning by doing
- Stricter implementation of CDM rules and modalities
- More stringent test of Additionality, satisfaction of applicability conditions
- Conservative, strict baseline/monitoring methodologies
- Strict supervision of the DOE performance
- Growth in number of methodologies, tools etc.
- Elaborate and transparent project appraisal, review and appeals procedures
- Larger number of projects put through review and even rejected
- Commercial market flourished, bolstered due to linkage with EU-ETS and expectation of large demand as the commitment period progresses

Thank you!

