



# *Small Scale Hydro CDM Projects Development*

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*January 2008*



# *Hydro Power*

## *Kinetic Energy to Electrical Energy*

- » Power plants capture the energy of falling water to generate electricity
- » A turbine converts the kinetic energy of falling water into mechanical energy.
- » Then a generator converts the mechanical energy from the turbine into electrical energy



# *Classification ??????*

<i>Installed Capacity</i>	
Micro	upto 100 KW
Mini	101KW to 2 MW
Small	2 MW to 30 MW
Large	30 MW to 500 MW
Mega	Hydro projects with installed capacity $\geq$ 500 MW

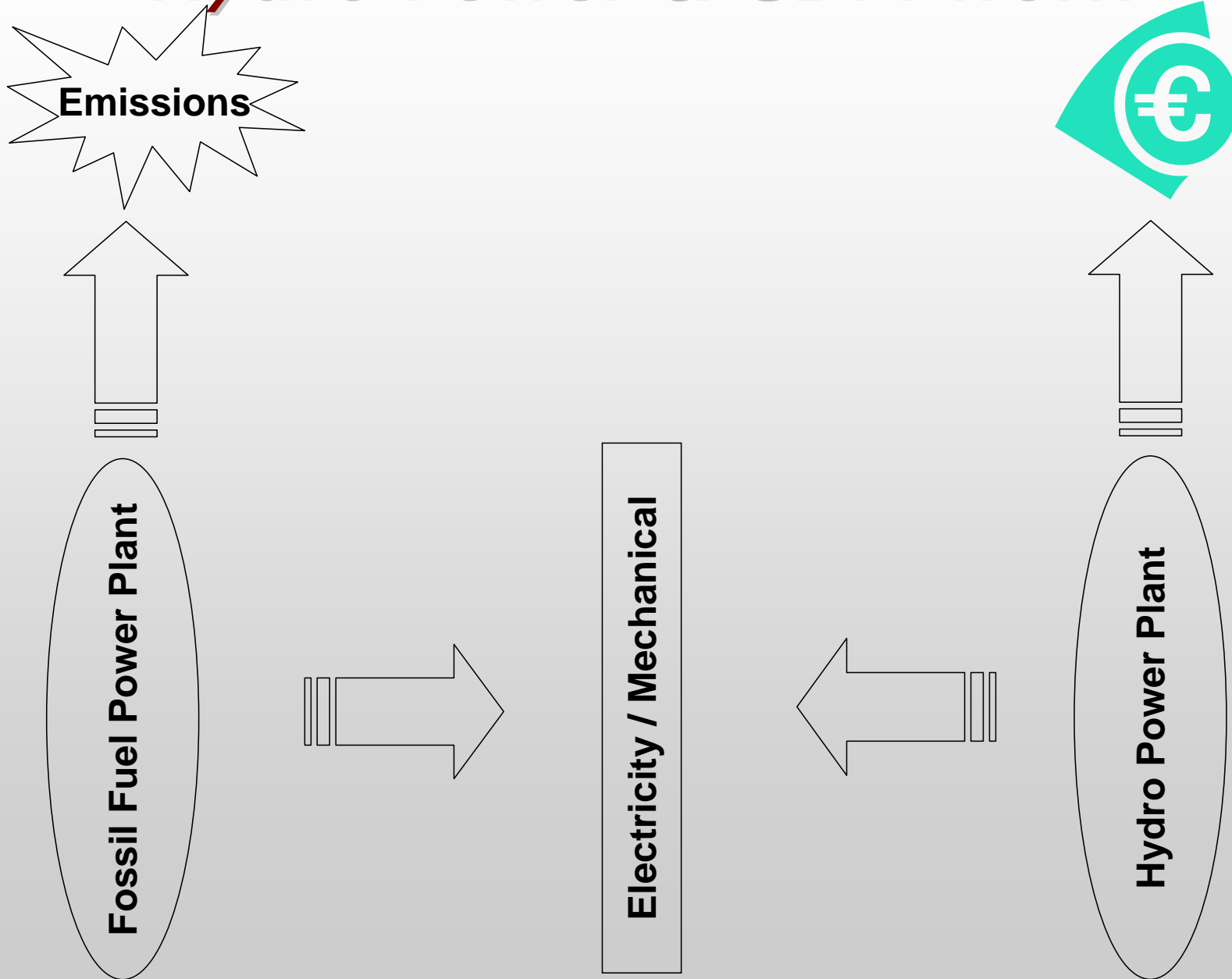


# *Classification ??????*

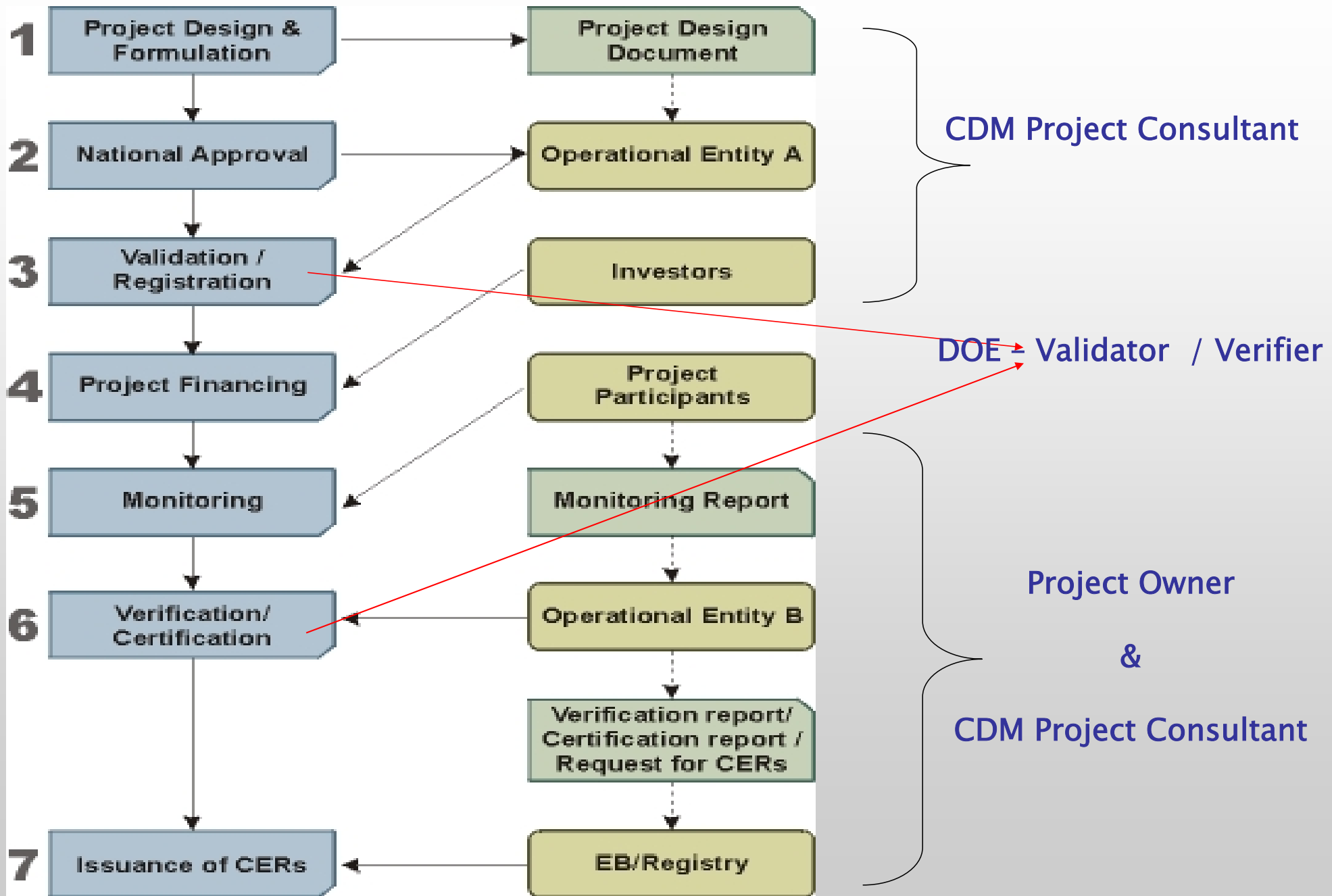
<i>Installed Capacity</i>		<i>CDM Scale</i>	
Micro	upto 100 KW	Small Scale	= < 15 MW
Mini	101KW to 2 MW		
Small	2 MW to 30 MW		
Large	30 MW to 500 MW	Large Scale	> 15 MW
Mega	Hydro projects with installed capacity > = 500 MW		



# *Hydro Power & CDM work*



# CDM Project Cycle





- » 1 MW Hydro Power Plant
- » Located in Himachal Pradesh (Northern Grid connected)
- » PLF - 30%
- » Power produced / Annum = 2.7 GWH
- » Generated power will be exported to Northern Grid
- » Annual Emission Reduction =  
*Power produced / Annum \* Emission Co- Eff of Northern Grid  
(CEA Version 3 Data)*
- » CERs = 3, 443
- » Annual Carbon Revenue = 20 – 30 Lakh INR
- » Boost IRR by 2 – 3 % with Carbon Revenue




# *Project Design Document*

## *CDM PDD – Project design document*

- » Prescribed format – UNFCCC
- » CDM project – Detailed Project Report
- » **Technical Report explains emission reductions** that are occurred / envisaged from the CDM PDD project activity
- » *Reference document* to all the stakeholders, Government of India, Validator and EB



PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD) - Version 03 

CDM – Executive Board

CLEAN DEVELOPMENT MECHANISM  
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)  
Version 03 - in effect as of: 22 December 2006

**CONTENTS**

- A. General description of the small scale project activity
- B. Application of a baseline and monitoring methodology
- C. Duration of the project activity / crediting period
- D. Environmental impacts
- E. Stakeholders' comments

**Annexes**

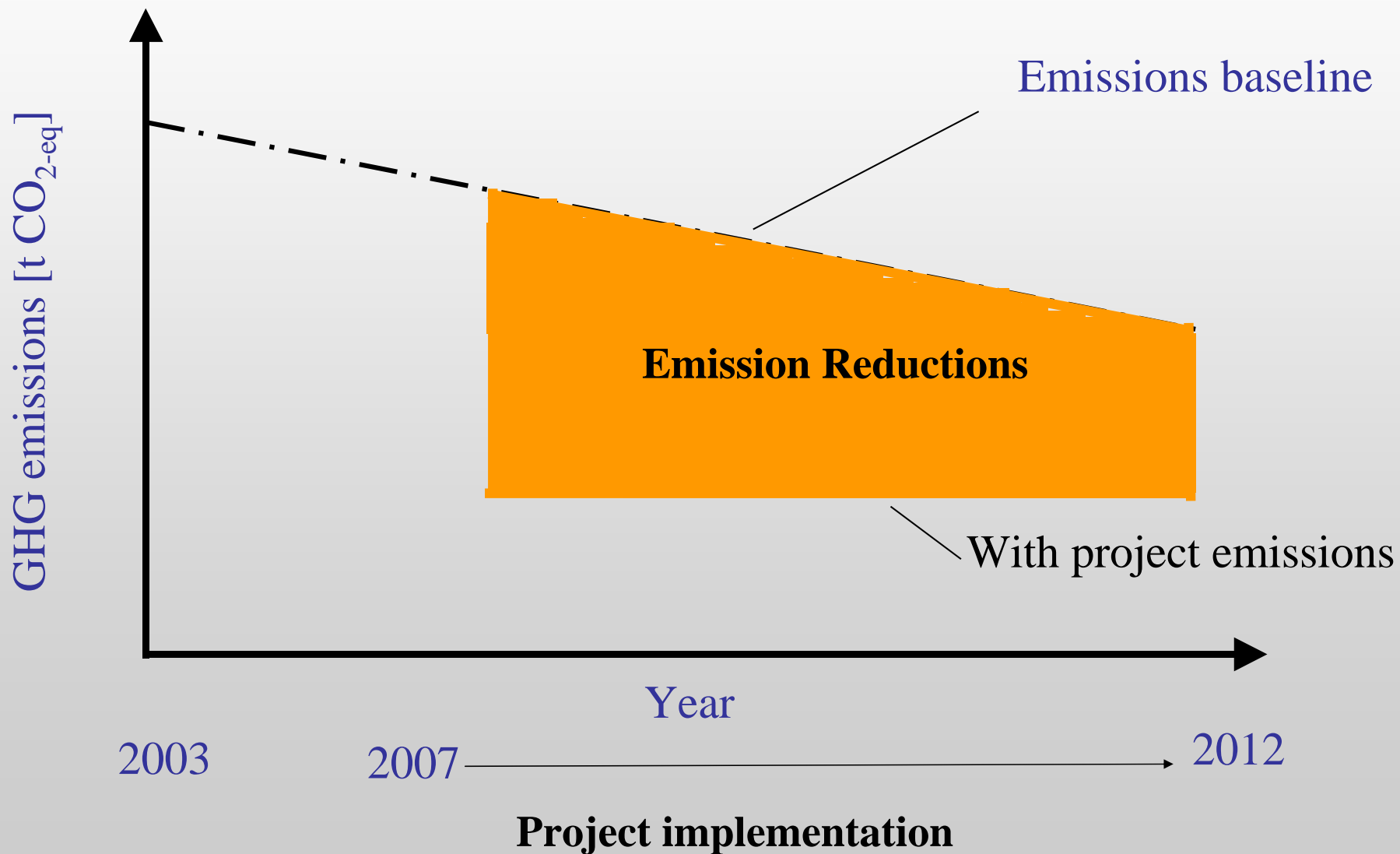
- Annex 1: Contact information on participants in the proposed small scale project activity
- Annex 2: Information regarding public funding
- Annex 3: Baseline information
- Annex 4: Monitoring Information
- Annex 5: Information regarding Stakeholder Consultation

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1. Information about Project Activity & Project Developer
2. Information about baseline emission reductions and its *monitoring protocol*
  1. Information about project *Baseline Additionality*
  2. Information about emission reductions and its *monitoring protocol*
3. Project Schedule
4. Environmental Aspects of the project
5. Information about *Stakeholder Consultation* Process



# *Emission Baseline*





## *Baseline & Additionality*

- » Baseline: Baseline for a CDM project activity is the scenario that happens in the absence of the project activity. **Baseline will be established on a project-specific** basis by the project participants complying with approved baseline methodologies
- » Additionality: Article 12 of the Protocol states that projects must result in **“reductions in emissions that are additional to any that would occur in the absence of the project activity”**. The CDM projects must lead to real, measurable, and long-term benefits related to the mitigation of climate change. The additional greenhouse gas reductions are calculated with reference to a defined baseline



# *Methodologies – SSC Hydro*

- » AMS I A
- » Electricity Generation by the user
- » Typical case
  - » Micro Hydel Power
- » AMS I D
- » Grid Connected Renewable Electricity Generation
- » Typical Case
  - » Mini Hydel Power Plants
  - » Small Hydel Power Plants upto 15 MW



# *SSC Hyro Power Projects – Snap Shot*

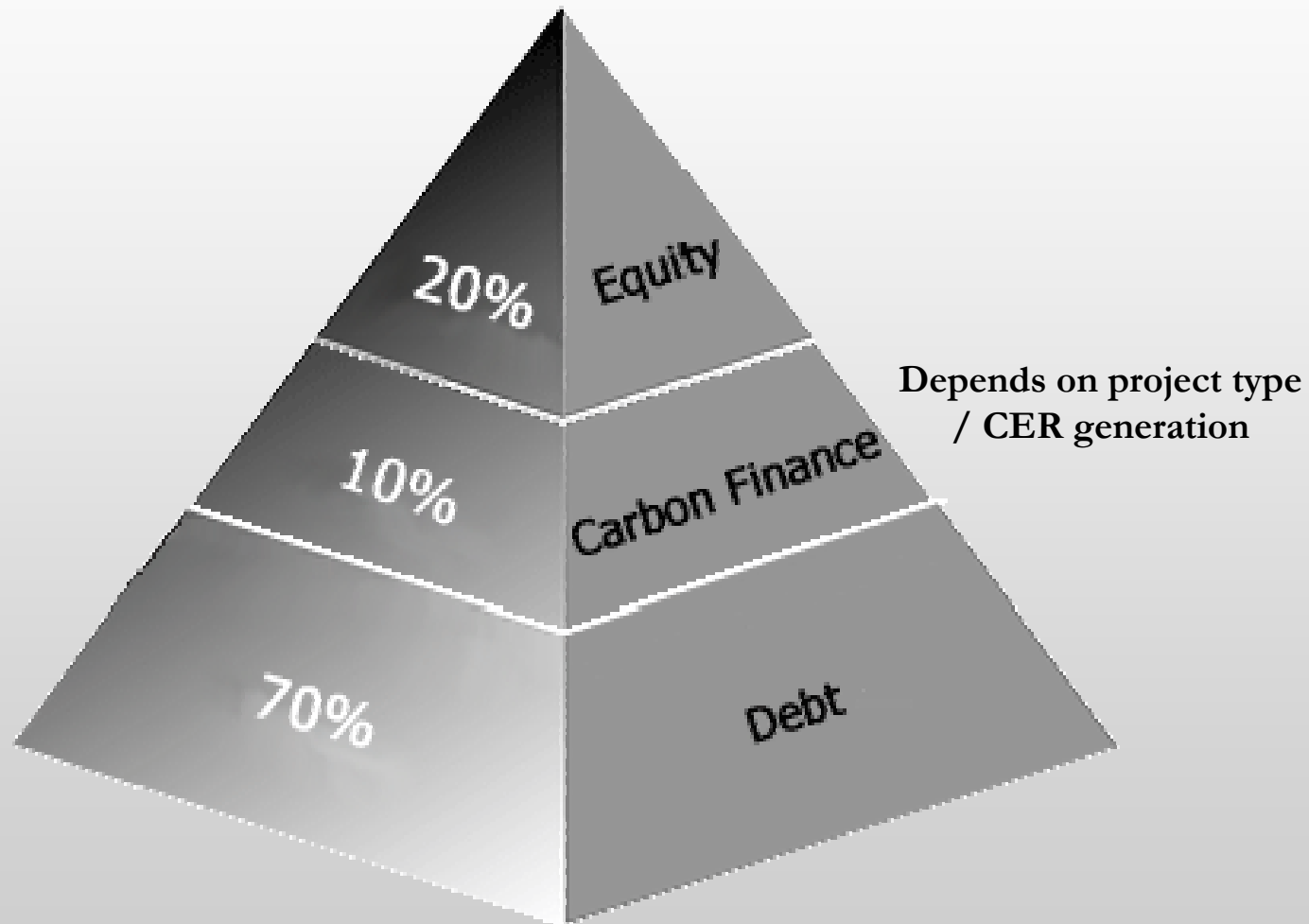
- » 1st project activity to Register and Issue CERs
- » 15 % of registered Projects are SSC Hydro power
- » 20% of registered Indian CDM Projects – SSC Hydro power projects
- » Great opportunity to develop under Gold Standard
- » Bundling could be good option
- » Potential is yet to tapped
- » Carbon Financing Option can be leveraged



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# *Carbon Financing*





# *Financing Options*

## 1. CDM Financing

- Transaction Costs – CDM Cycle
- PDD, Validation, New Baseline Methodology, Registration Charges, Verification

## 2. Project Financing

- Project activity physical funding
- Equity – SPV
- Technology / O&M, .....
- Corporate loan



# *Financing Options*

## 3. ERPA Based Financing

- Transaction Costs – CDM Cycle
- PDD, Validation, New Baseline Methodology, Registration Charges, Verification





## *GTZ CPU Offers...*

1. Project Identification
2. Technology Assistance
3. Upfront Financial Models
4. Carbon Financing – Priority
5. Structuring Financial Contracts
6. Legal Assistance
7. Sustained Delivery of emission rights



*Thanks for your attention*

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