



CDM Opportunities in Agriculture Sector

October 30, Beijing

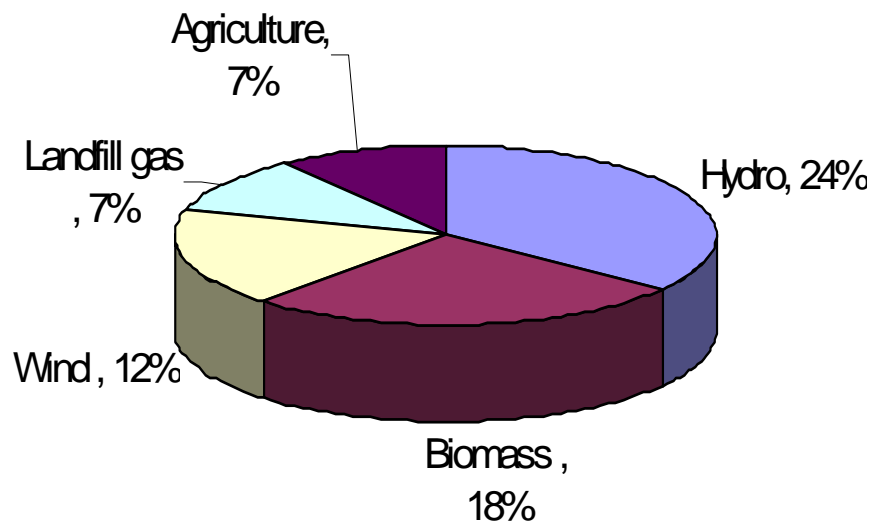
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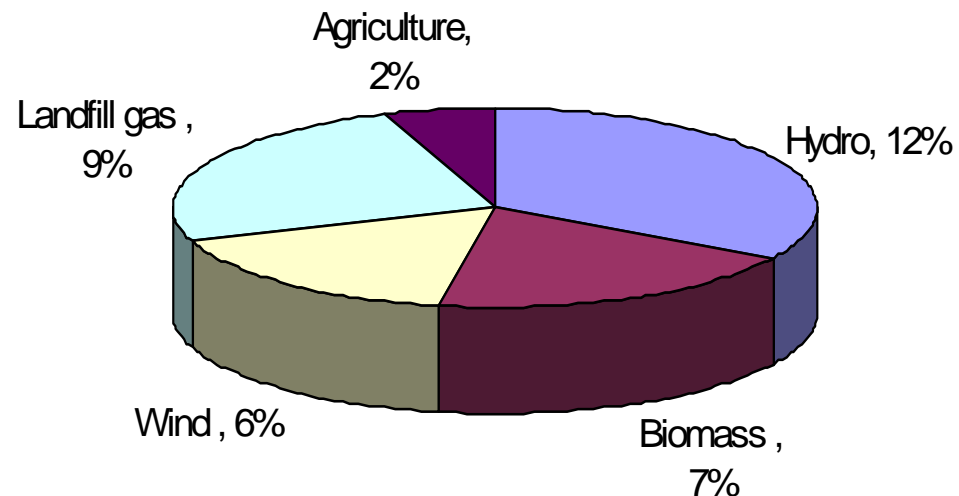
Top five categories of renewable energy project in CDM pipeline



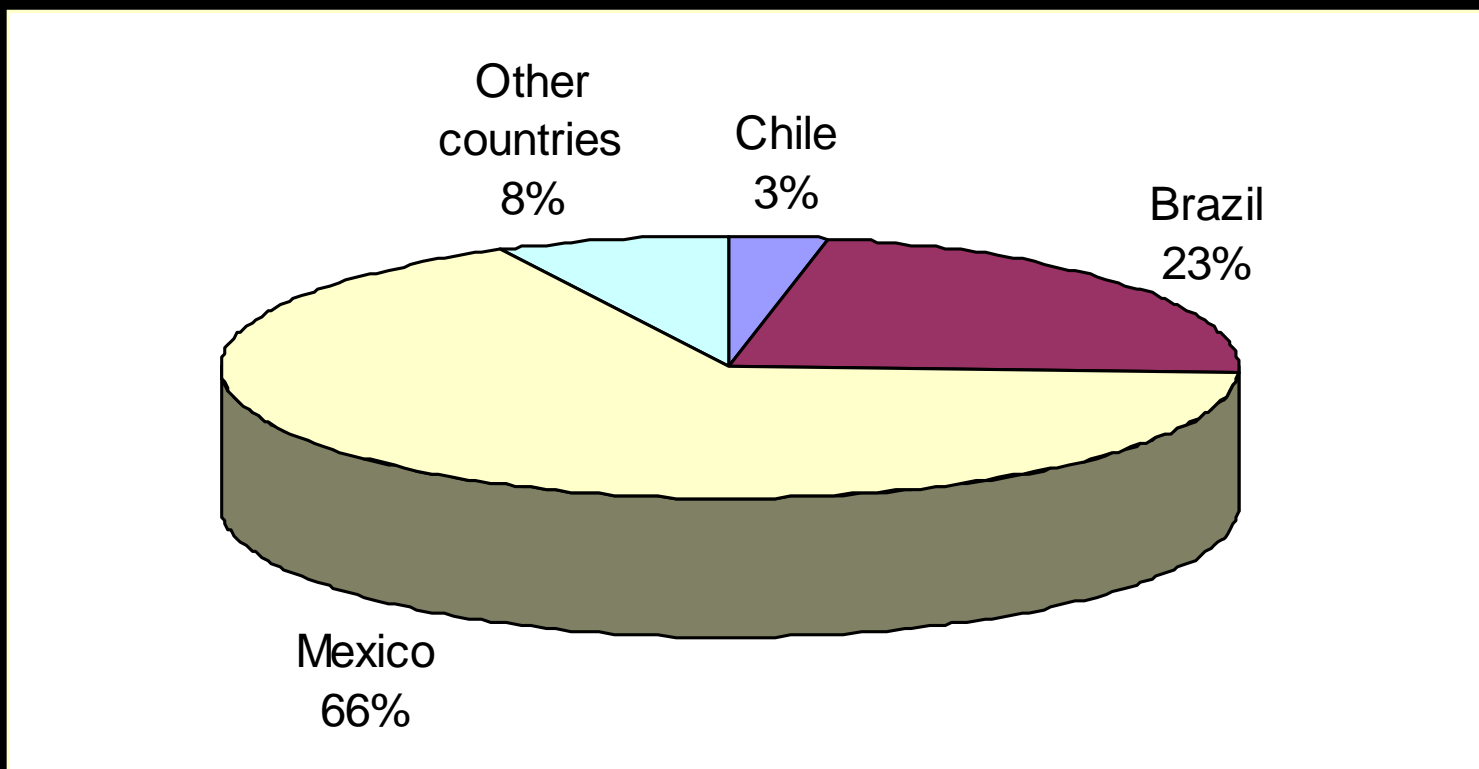
Total share in CDM pipeline (%)



Share of CERs by 2012 (%)



Share of AD projects by countries



Types of CDM projects in agriculture sector



- Anaerobic digester +flaring with or without power generation (only 3 projects)
- Covered anaerobic lagoons + flaring with or without utilization of biogas (90% of CDM portfolio)
- Combustion of poultry litter +power generation (only 2 projects)

Approved CDM methodologies



- ACM0010 – Methodology for GHG emission reductions from manure management systems

AMS.III.D – methane recovery in agricultural and agro industrial activities

- AMS III.E – avoidance of methane production from biomass decay through controlled combustion

All above methodologies follow 2006 IPCC Guidelines



Example 1: China Minhe Poultry Manure to Power Project

- Total chicken population: 3.6 million broiler & 1.4 million breeder
- Daily fresh manure 500 tons with 20% of total solid
- Waste water of 1000 ton from flushing the chicken barn
- Current practice of manure management: uncovered lagoon
- Proposed project: Anaerobic Digester + Co-generation
- Total Investment: 5.2 million USD
 - O&M Cost: 715,000 USD
 - Revenue w/o carbon: 1 million USD
 - Revenue w/ carbon: 1.9 million USD

	Without Carbon	With carbon
IRR	2.38%	18%
NPV (discount rate=9%)	-2.3 million USD	4.3 million USD
Payback Period	20 year	5.6 year

Case Study: Minhe Poultry Manure to Power Project



Pre-project activity
condition : uncovered
lagoon



Project activity condition:
Biogas digester with co-
generation and aerobic
treatment of liquid residue



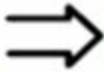
Example 2. Methane recovery from covered anaerobic lagoons, Mexico



- Current practice: open anaerobic lagoon
- CDM project: lined covered lagoon with HDPE geomembrane
- Applicable methodologies: ACM10 & AMS.III.D
- Installed costs: USD 150,000 (without power generator)
- Operational costs: USD 2500
- Number of heads: 73,000 swine
- Estimated ERs: 61k tons of CO₂e per annum



Pre-project Activity Condition:
Open Air Lagoon



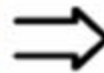
Project Activity Condition:
Anaerobic Digester with Flare



Minimum Configuration - Open Lagoon to Ambient Temperature Anaerobic Digester with Flare



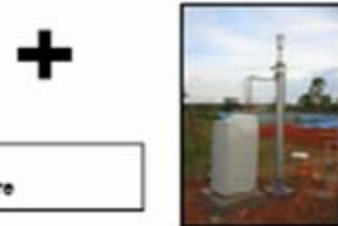
Pre-project Activity Condition:
Open Air Lagoon



Project Activity Condition:
Anaerobic Digester with Co-Gen and Flare



&/or other
renewable
energy
equipment



Optional upgrade - Open Lagoon to Ambient Temperature Anaerobic Digester with Co-Gen & Flare

Example 3. Combustion of poultry litter for power generation



- **Baseline:** poultry litter disposed of in a landfill
- **CDM Project:** combustion of poultry litter to produce electricity and to avoid methane production. Manure should be dry !
- **Applicable methodology:** AMS.III.E
- **Costs:** Installed costs per MW is in the range of 1.5 to 3 Mln USD.
- **Rules of thumb:** The poultry farm produces 100 tons of dry poultry litter per day which sustains 3MW power plant and reduces 65,000 tons of CERy (45k from methane avoidance and 20k from electricity displacement).



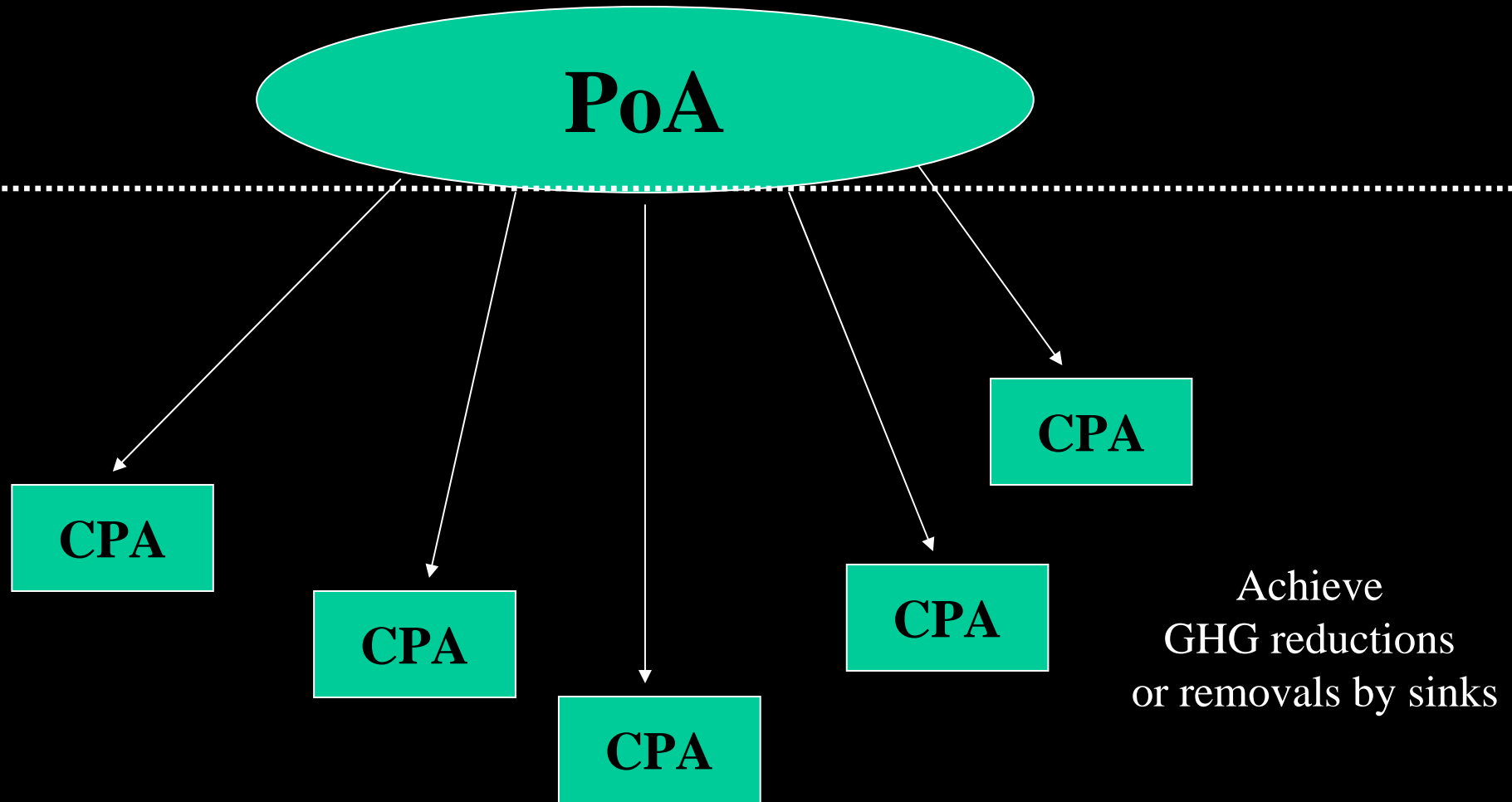
New approach : CDM - Program of Activities

POA – Program of Activities

CPA – CDM Program Activity

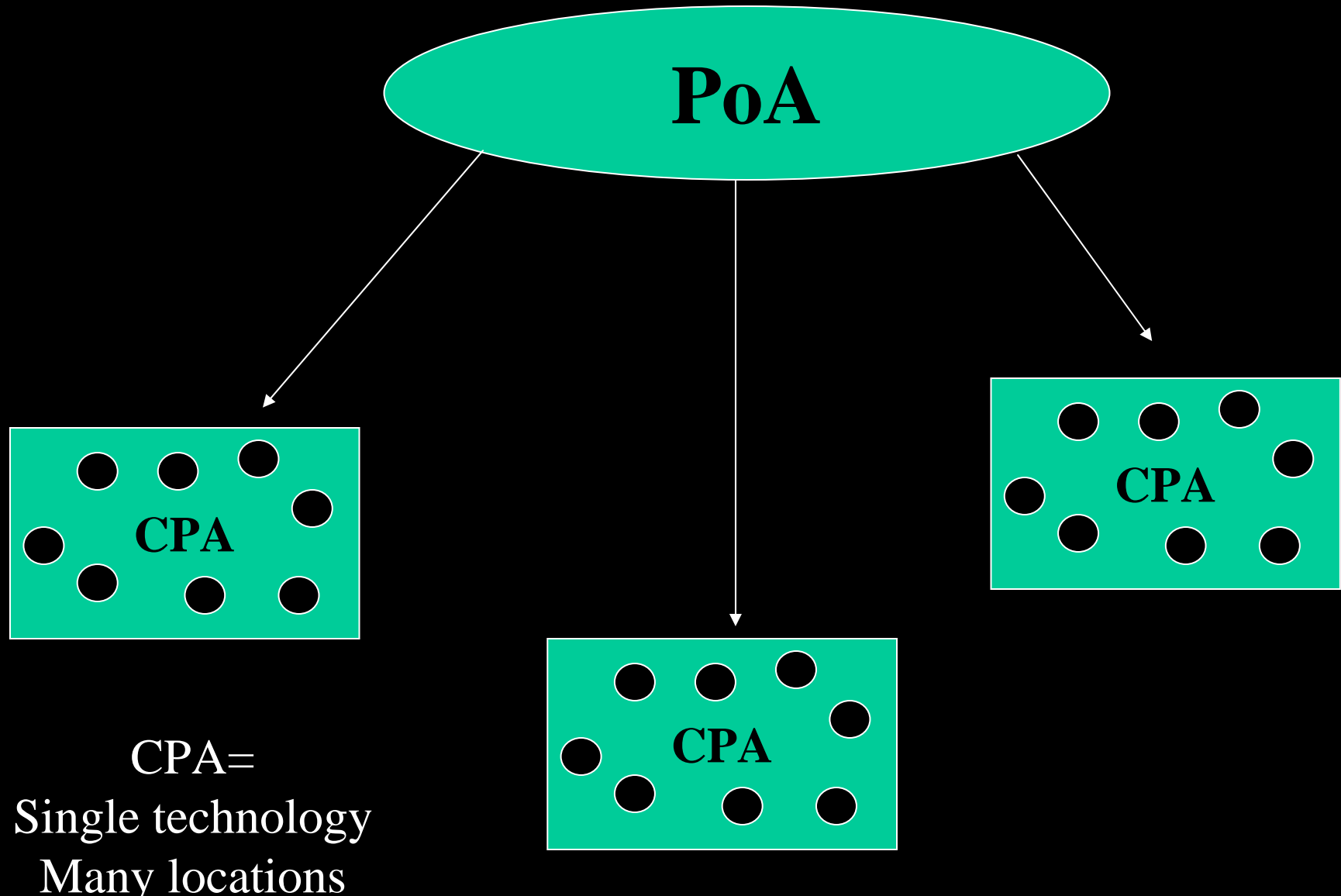


How this works





Example





Characteristics of PoAs

- One coordinating agent
 - Private or public
 - Provides incentives/environment for others to achieve reductions
 - Physical boundary can extend beyond one country
- Additionality
 - PoA would not be implemented, or leads to greater enforcement
- One baseline & monitoring methodology
 - Sampling allowed for verification, if appropriate
 - Duration 28 years

Characteristics of CPA



- Can be implemented by many entities/owners
 - CPA can be added to PoA at any time during duration of PoA
- One methodology
 - Any small or large scale approved methodology
 - SSC methodologies have been adjusted for leakage for use in PoAs
 - All CPAs are monitored as per monitoring plan
 - **Verification can be done by sampling**



Thank you !

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Useful References

General Websites on CDM and JI:

- Internal CFB website on CDM methodologies: Carbon Finance at the World Bank: Methodology (www.carbonfinance.org)
- Website of the UNFCCC: CDM: CDM-Home (<http://cdm.unfccc.int/> and <http://ji.unfccc.int/>)
- Webiste of IPCC 2006: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_10_Ch10_Livestock.pdf
- Website on CDM (and JI) procedures (Ministry of the Environment Japan, Institute for Global Environmental Strategies): <http://www.iges.or.jp/en/cdm/report01.html>
- Website (UNEP, Risø Centre): CDM (and JI) pipeline overview
<http://cd4cdm.org/index.htm>