

Emission Reduction Potential by Rural Biogas and CDM Project Development in China

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Outline

- Development of the global CDM
- CDM Development in China
- The introduction and experience on development of rural biogas CDM projects
- Rural biogas development and emission reduction potential

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Development of the global CDM

- By 21 08 2009, 1782 CDM projects were registered by CDM EB in the world, including 82 manure management projects
- Expected average annual CERs is about 312 million tons of CO₂-e
- Expected average annual CERs from manure management projects is about 4,7 million tons of CO₂-e, ~1.5% of the total CERs

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CDM Development in China

- 2127 Projects were approved by Chinese DNA. Calculated emission reduction is 408 million tons of CO₂-e, only 625 projects were registered by CDM EB
- 10 projects related to manure management were approved by Chinese DNA. Expected annual emission reduction is 504 thousand tons of CO₂-e
 - Poultry farms (2)
 - Swine farms (5)
 - Cattle farms (1)
 - Household biogas digesters (2)
 - Among the 10 approved projects, only 3 projects were registered by EB

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The introduction and experience on development of rural biogas CDM projects

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The experience to develop Rural biogas CDM project

- Two types of manure management project were developed by a group of experts in IESDA, CAAS together with WB
- One is poultry farm---improve manure management system and power generation connected to the grid
- One is household biogas digester---improve manure management system and heat generation for households
- Both of these two projects were registered by EB

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Minhe Poultry Farm

- 29 chicken farms
- Annual stock: 4.3 million heads
- Baseline: Open lagoon
- Project activity: Biogas digester with power generation



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Minhe Poultry Farm

- Methodologies
 - Consolidated baseline methodology for GHG emission reductions from manure management systems(ACM0010)
 - National Development and Reform Committee published the Operating Margin emission factor and the Build Margin emission factor every year

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Expected Emission Reduction (t CO₂-e)

Baseline	Project activity	Leakage	Emission reduction
81,140	10,512	4235	66,393
IRR: Without income from CERs		0.85%	
IRR: With income from CERs		9.59%	

According to the biogas flow meter and electricity meter, biogas production is 25,000~30,000m³d⁻¹, electricity production is 50,000~60,000kwh. Real ER is higher than estimated ER

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Financial Analysis

- Total Investment : 69.88 million RMB
- O&M cost: 6.12 Million RBM/yr
- Annually output delivered to the grid: 21900 MWh/yr
- Revenues from the sale of electricity:10.13 million RMB/yr
- Revenues from the sale of CERs: 7.08 million RMB

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Experience in the CDM project development

- Detailed record of relevant information and data
- Existing baseline
- Additionality
- Technical staffs
- Well managed

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Introduction of Hubei household biogas CDM project

- Project activities was carried out in eight counties. These counties are located in poor mountainous areas of southwest of Hubei Province.
- The project installed "one biogas digester with 3 supplementary renovations" for 33,000 households in the eight counties.
- The project would treat manure for 155.7 thousand of pigs
- It is anticipated that the total biogas production will be about 12.17 million m³ and 23,350 ton of coal could be saved per year.
- The estimated annual emission reduction will be 58444 ton CO₂ equivalent.

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Introduction of Hubei household biogas CDM project

- Emission reduction:
 - Improved manure management to reduce CH₄ emission
 - Fossil fuel replacement to avoid CO₂ emission
- Expected emission reduction: 1.43~2.02 t CO₂-e.a⁻¹ household⁻¹
- Revenue from CDM is 140—200 Yuan per digester
- New methodology was developed and approved by EB
- AMS III.R and AMS I.C were applied

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Introduction of Hubei household biogas CDM project

- Other benefit:
 - Reducing greenhouse gas (GHG) emissions to combat global climate change.
 - Improving local environment and public health
 - Increasing local incomes
 - Diversifying the energy resources

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Experience of development of household biogas CDM project

- Technical support provided by WB, several training courses provided
- Well organized and coordinated by all levels of local governments
- One staff was designated in each county to response the coordination and data collection
- Household information and baseline data were real and accurate, archived electronically and hard copy
- Two staff in each county are responsible for the input and check the data and information

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Organization and coordination of the project

- Project Entity: domestic approval, Monitoring report, Carbon trading, validation, registration and verification
- Project Entity entrusted Enshi Rural Energy Office with the coordination and management of the project, including project development, supervising the implementation, provision of training, gathering and providing household information and monitoring data to Project Entity
- Rural Energy Office in each county will responsible for project management and implementation, collection and archive monitoring data and household information electronically and in paper document
- Township service centre: Responsible for biogas digester maintenance and other services
- Village service network: Responsible for biogas digester maintenance and fittings
- Household: Biogas digester construction, recording operation times, destination of biogas residue

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Rural biogas development and emission reduction potential

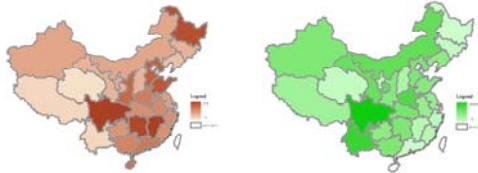
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Laws and Policies for biogas development

- Chinese government has attached great importance to the development of rural biogas industry. Numerous laws and politics issued by the central government since 2005 have highlighted the importance of biogas development
- MoA published in 2007 a plan to develop biogas projects during the period of 2006-2010. China will build additional 18 million household biogas digesters by the end of 2010.
- China will build approximately 4,000 medium and large biogas digesters at intensive livestock farms. By the end of 2010

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Rural biogas development in 2009



1579 medium and large scale of biogas projects and 1.656 million household biogas digesters were and will be constructed with the support of governments in 2009

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Emission reduction by rural biogas

- Emission reduction by household biogas digesters built in 2009 is about 2 Mt CO₂-e
- Emission reduction by medium and large scale of biogas projects constructed in 2009 is about 3.5 Mt CO₂-e (assumption: 5000 pigs/livestock farm)

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Future CDM project development in China

- Household biogas digester programmatic CDM projects are being developed in Hunan, and Chongqing, cooperated with Finland and Japan
- Medium and large scale biogas digester programmatic CDM project will be developed in Hubei, cooperated with WB
- Household biogas digester CDM projects in more than 30 counties in Shandong Province, cooperated with WB

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Thanks for your attention

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