

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.:

<b>Project Name</b>	Shandong Provincial Biogas CDM Program
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Sector</b>	Rural Development
<b>Project ID</b>	P115878
<b>Borrower(s)</b>	
<b>Implementing Agency</b>	Shandong Finance Bureau and Shandong Agriculture Bureau Mr. Teng Xiqun, Director Agriculture Project Office of Introduction & Utilization Foreign Loan, Shandong Agriculture Bureau Telephone: 0531-67866269 Fax: +86- 0531-82352955
<b>Environment Category</b>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD
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<b>Date of Board Approval</b>	December 28, 2009 (Carbon Finance Appraisal Memorandum Approval)

**A. Country and Sector Background**

1. Climate change. China's economy has experienced remarkable growth in the past decades, but unfortunately this has been accompanied by an increase in emissions of greenhouse gases (GHGs). China is the world's second largest emitter of GHGs, accounting for nearly 15 percent of global GHG emissions. The World Bank, as a trustee of carbon finance funds, is committed to the use of market initiatives with the Clean Development Mechanism (CDM) established under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) to support development of GHG emission reductions (ERs) to mitigate climate change. A key objective of the Bank's effort is ensuring that developing countries and economies in transition participate effectively in the emerging carbon offset market for GHG emission reductions by promoting carbon market activities that reduce transaction costs, support sustainable development and reach and benefit the poor communities of the developing world.

2. China is one of the signatories of the UNFCCC which ratified the Kyoto Protocol on August 30, 2002 and is one of most active countries in the CDM sector. Since signing, China has registered 452 projects with UNFCCC, ranging from renewable energy to energy efficiency, with total ERs of 160,605,087.2 tons of CO<sub>2</sub>. The potential for agriculture to contribute to GHG emission reduction has long been recognized, but only a few actions have been taken due to comparative low capacity of the sector, the challenge to coordinate actions by dispersed farmers, etc. Although the CDM carbon market has experienced rapid development worldwide during last five years, there is only one project from China's rural sector which was registered as a CDM project with UNFCCC, which is the Hubei Enshi Eco-farming Project supported by the World Bank in China.

3. Biogas development is an important GHG ER tool for the rural sector. In Shandong province, with the support of substantial national and provincial subsidy programs for biogas development during past few years, there are now some 1.5 million of rural households which have installed a standard biogas facility comprising a biogas digester with improvements on kitchen, toilet and pig sty (“three in one”). However, there are still more than 10 million rural households which have suitable physical conditions to build such biogas facilities but are constrained due to financial limitations. Without biogas, the common practice of rural households for animal waste treatment is using open lagoons to store animal waste, which emits methane into the atmosphere directly. Meanwhile, the traditional practice of burning of coal for daily life needs produces substantial CO<sub>2</sub> emissions and also has a large impact on local air pollution caused by the smoke.

4. Carbon Finance. The proposed Carbon Finance project under the CDM will facilitate the development and use of biogas at the rural household level by giving carbon revenue directly to households to increase their financial incentive to invest in household biogas facilities. This project is consistent with the Bank’s China Country Assistance Strategy in that it aids in ensuring environmental sustainability in a manner that also produces immediate and tangible local benefits.

5. The World Bank will not provide any financial support for project investment but will purchase ERs under the established methodology of UNFCCC. Based on a rough conservative estimate, the target ER amount is estimated to be 600,000 tons of CO<sub>2</sub> which is equivalent to EUR 4,800,000 based on (1) the prevailing market price for Certified Emission Reductions (CERs) from the project in the primary market, and (2) the CER price acceptable to China’s Designated National Authority (DNA) for similar projects (“China DNA Floor Price”) at the time that the Project Entity and the Trustee conclude negotiations of the Emission Reduction Purchase Agreement (ERPA). CERs equivalent to 75% of the above amount are expected to be generated before January 1, 2013<sup>1</sup>.

## **B. Project Objective**

6. The objective of the proposed project is to promote large-scale rural greenhouse gas (GHG) emissions reductions through household biogas development in Shandong province. To meet this objective, the project would: (i) help about 150,000 households located in about 45 comparatively poor counties install bio-digester/biogas facilities; (ii) reduce coal consumption by substituting use of biogas; (iii) establish an innovative operation and maintenance (O&M) system and monitoring and evaluation system for rural household biogas development and related GHG reduction activities in the rural sector; and (iv) demonstrate a new financing mechanism for household biogas development in rural China through use of incentive payments to households based on carbon offset revenue, integrated into the national and local government subsidy programs for biogas development. The proposed project would help meet China’s national climate change mitigation targets, and improve rural living conditions by changing human and animal waste treatment techniques.

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<sup>1</sup> The first commitment period of the Kyoto Protocol is 2008-2012. One rule for some of carbon funds managed by the World Bank is to have 75% of the ERs generated by January 1, 2013, in which case the Bank would purchase the remaining 25% of ERs generated after 2012 in order to maximize CDM support for project development.

## C. Rationale for Bank Involvement

7. The World Bank is the only international agency who has significant experience with the CDM for biogas development in China and has received a strong request from the Chinese government to help extend the impact of that experience to wider areas. In addition to the technical challenge of meeting requirements of CDM methodologies regarding biogas, the management challenge of implementing biogas development for a widely dispersed household biogas program is very severe. The proposed project would be designed and implemented in conjunction with Shandong's ongoing FY09-10 household biogas program, and it has been specially designed as a pilot operation to build capacity at province, municipality and county levels for the application of the CDM incentives program and to promote participation by poor households. It is anticipated that the techniques and mechanisms to be developed under the project would be replicated and applied under ongoing programs in other provinces of China.

## D. Description

8. It has been confirmed that 45 counties, with a target to install a total of about 150,000 household bio-digesters, will be included in the project area. Based on experience with other similar CDM projects under the World Bank Carbon Finance program, and assuming average GHG emission reduction to be about 1.5 ton of CO<sub>2</sub>e per household, the annual ERs of the project are estimated to total 220,000 tons of CO<sub>2</sub>e based on a technical assessment, and at full project development, the conservative target ER amount is estimated to be 600,000 tons of CO<sub>2</sub>, which is equivalent to EUR 4,800,000. Bank project management experience could be built into project implementation and organization and management arrangements.

9. **Project Components.** The project has the following components:

**Component A: Development and Construction of the Bio-gas Facilities**, including the technical design and construction of about 150,000 household-based biogas digesters in 45 counties in Shandong;

**Component B: Development and Establishment of a Sustainable Household Biogas Operation and Maintenance (O&M) System**, including establishment or improvement of biogas service stations at county and township levels, procurement of the necessary service equipment and supplies, and development and implementation of O&M plans for local project areas; and

**Component C: Institutional Strengthening and Project Management**, including: (i) specific CDM training program design and implementation (training for farmers, technical service staff, and project management officials); (ii) establishment of the project monitoring and evaluation (M&E) system including a M&E database management system, designed as a model for use with other rural household biogas development and related GHG reduction activities in the rural sector; and (iii) a M&E center in each county for key monitoring information collection and evaluation (based on the data from township and village level).

## **E. Financing**

10. The World Bank will not provide any financial support for project investment but will purchase ERs under the established methodology of UNFCCC, which is equivalent to EUR 4,800,000 (see para. 5 above). The project financing arrangement is as follows:

Source:	(YMillion)
Government	222.7
Framers' Contribution	420
Total	622.7

## **F. Implementation**

11. To ensure a successful implementation of the project, Shandong has set up a project management committee (Leading Group), composed of the provincial Finance Bureau and Agricultural Bureau (mainly including Comprehensive Agriculture Development Office (IAIL3 PMO), Livestock Division, Eco-farming Division and Project Management Office (PMO) for Introduction & Utilization of Foreign Loans), which is responsible for overall coordination during project preparation and implementation. The executive body of the management committee is the PMO which is to be responsible for day-to-day project management. The Provincial AB Eco-farming Division and its county Rural Energy Service Stations will be responsible for day-to-day project implementation at their respective levels.

12. The PMO will take the lead to coordinate project preparation, supported by the AB Eco-farming Division (the government bio-gas subsidy program implementing agency) and its Rural Energy Service Stations at the county level. The provincial Eco-farming Division under AB will support data collection, project management and monitoring, with Rural Energy Service Stations to be managed by the ABs in each county.

13. To meet the requirement of Chinese CDM regulations that the CDM project owner can only be an independently registered private corporation, Shandong identified Biyu Company as the bundling agency on behalf of the 150,000 households to receive ER ownership after signing of sub-agreements with individual households. Shandong Finance Bureau plans to use the existing financial system to disburse carbon revenue directly to household bank accounts, but the exact mechanism is subject to further confirmation. To build Shandong's capacity for utilizing CDM funds in the agriculture sector, it is agreed that Shandong CDM Starter Company under Shandong EPB will be the consultant agency for CDM documentation and validation given its relatively extensive experience with CDM-related services. Because one of the barriers for poor households to participate in this program is lack of financing, the Rural Credit Cooperative and Agriculture Bank have agreed to consider giving loans of duration longer than 1 year to the farmers for the farmers' contribution toward the construction costs.

## **G. Sustainability**

14. To make the Project sustainable, the Bank TT will work together with the Project Joint Leading Group to make arrangements on following aspects: (a) effective project management and implementation arrangements; (b) sound design and implementation standards; (c) strong

leadership and effective coordination at various Municipal and County government levels to ensure adequate funding and efficient use of funds, timely completion of procurement plans and high quality design and construction of works; (d) the introduction of efficient and sustainable operation and maintenance (O&M) procedures and effective arrangements at both government and community levels to assure adequate funding and technical support for O&M after project completion; and (e) the establishment of the project monitoring and evaluation (M&E) system related to GHG reduction activities for all project farm households. These factors will be addressed during project preparation and incorporated into the design of the Project.

## **H. Lessons Learned from Past Operations in the Country/Sector**

15. The project design incorporates recent lessons from similar Bank and CDM projects in the agriculture sector, including especially the following.

16. Ownership and commitment. A key feature in the success of similar Bank projects in China has been the borrower's ownership and commitment. For this project, Shandong province has shown strong commitment to the project. It has already established a joint working office which serves as the provincial leading group to provide coordination among the concerned agencies, allocate government funds, set up selection criteria for target areas, collect the baseline information required by CDM and provide training and support to provincial agencies and county governments on project management and monitoring. The counties will assign focus points within the Agricultural Bureau (AB) system with responsibility for overall coordination. The PMO for the Bank's IAIL3 project in Shandong, which is responsible for preparation and successful implementation of the ongoing IAIL3 project and has substantial experience with Bank projects, was combined into the above joint working group office to help the management of the project preparation and implementation. Moreover, significant funding is provided by the provincial government for the project, and the provincial and county FB and AB offices are directly involved in implementation.

17. Project funds. The project funds from local governments should be committed before project implementation starts while minimizing the amount of funds from farmers' contribution, especially for the relatively poor farmers.

18. Participatory approach applied during the project cycle. During the process of project preparation through commissioning, public consultation and technical training will be organized to mobilize household initiative and build up knowledge on biogas operation/maintenance/recording as well as use of digested sludge.

19. Capacity of the biogas services network down to village level. Given the shortage of local budgets, biogas services capacity becomes an obstacle for biogas development in rural areas. Part of the carbon revenues under the project will be used for equipment purchase, training and staff recruitment to strengthen these service capacities as needed within the project areas.

20. Project monitoring and evaluation system. In order to comply with CDM requirements on monitoring and documenting biogas operations, a monitoring system will be established and maintained for selected representative households. A suggested monitoring and evaluation template including critical indicators will be designed during project preparation and provided to

the AB for reference during implementation. Introducing such scientific management techniques to comparatively less developed sectors will help ensure better results and achievement of project objectives.

21. The above lessons and other key factors for success identified by the Bank and the TT, will be reflected where appropriate in the design of the proposed project.

**I. Safeguard Policies (including public consultation)**

6. Safeguard Policies Triggered ( <i>please explain why</i> )	Yes	No	TBD
Environmental Assessment (OP/BP 4.01)	X		
Natural Habitats (OP/BP 4.04)		X	
Forests (OP/BP 4.36)		X	
Pest Management (OP 4.09)		X	
Physical Cultural Resources (OP/BP 4.11)		X	
Indigenous Peoples (OP/BP 4.10)		X	
Involuntary Resettlement (OP/BP 4.12)		X	
Safety of Dams (OP/BP 4.37)		X	
Projects on International Waterways (OP/BP 7.50)		X	
Projects in Disputed Areas (OP/BP 7.60)		X	

**J. List of Factual Technical Documents**

- (1) Project Idea Note
- (2) Project Concept Note
- (3) Integrated Safeguards Data Sheet (ISDS)
- (4) ISDS Review Meeting Minutes
- (5) Mission Aide Memoires

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