

PROJECT PREPARATORY TECHNICAL ASSISTANCE

A. Justification

1. A project preparatory technical assistance (PPTA) is required to (i) conduct the due diligence on several aspects of the proposed loan (para. 13, main text), and (ii) facilitate learning opportunities in emerging biogas and biomass technologies and business practices.

B. Major Outputs and Activities

2. The major outputs and activities are summarized in Table A3.1.

Table A3.1: Summary of Major Outputs and Activities

Major Activities	Expected Completion Date	Major Outputs	Expected Completion Date
Conduct due diligence of the project	November 2017	Appraisal report including safeguards documents	December 2017
Hold technical capacity building workshops and knowledge sharing events	November 2018	Shared best practices in biomass and biogas	December 2018

Source: Asian Development Bank estimates.

C. Cost Estimate and Proposed Financing Arrangement

3. The technical assistance (TA) is estimated to cost \$500,000 equivalent, and will be financed on a grant basis by Asian Development Bank's (ADB) Technical Assistance Special Fund (TASF-other sources). The detailed cost estimate is in Table A3.2. The government was advised that approval of the TA does not commit ADB to financing any ensuing project.

Table A3.2: Cost Estimates and Financing Plan
(\$'000)

Item	Total Cost
Asian Development Bank^a	
1. Consultants	
a. Remuneration and per diem	
i. International consultants (10.5 person-months)	274.0
ii. National consultants (14 person-months)	77.0
b. International and local travel	67.0
c. Reports, translations, and communications	5.0
2. Workshops, training, seminars, and conferences ^b	19.0
3. Surveys	10.0
4. Overseas training ^c	20.0
5. Contingencies	28.0
Total	500.0

^a Proposed for financing by Asian Development Bank's Technical Assistance funding program (TASF-other sources).

^b Workshops, training, seminars, and conferences to be administered by the consultants. Includes interpretation, translation, and insurance costs.

^c This is to acquire advance technologies in biogas, and biomass energy. Activity will be carried out in Asian Development Bank member countries only.

Source: Asian Development Bank estimates.

D. Consulting Services

4. The TA will take a two-team approach to use consulting services efficiently. The technical and financial team will require three individual international consultants (6 person-months) and two individual national consultants (7 person-months). The safeguards team will require two individual international consultants (4.5 person-months) and two individual national consultants (7 person-months). All consultants will be recruited through individual consultants selection by ADB in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The project team and implementing agency will be responsible for coordination and administration, or fixing the collective responsibility. The required positions and person-months are indicated in Table A3.3. The proceeds of the TA will be disbursed in line with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). Lump sum payments/output based contracts will be considered under the TA.

Table A3.3: Summary of Consulting Services Requirements

International Name of Positions	Person- months	National Name of Positions	Person- months
A. Technical and Financial Team			
1. Biogas production specialist	2.0	1. Biomass specialist	5.0
2. Biogas purification specialist	2.0	2. Financial analyst	2.0
3. Biomass pellets production specialist	2.0		
Subtotal (A)	6.0		7.0
B. Safeguards Team			
1. Environmental impact assessment specialist	3.0	1. Environmental impact assessment specialist	5.0
2. Social analysis and safeguards specialist	1.5	2. Social analysis and safeguards specialist	2.0
Subtotal (B)	4.5	Subtotal (B)	7.0
Total	10.5		14.0

Source: Asian Development Bank estimates.

5. The outline terms of reference for the technical and financial team of TA consultants are described in paras. 6 to 10.

6. **Biogas production specialist** (international, 2.0 person-months, intermittent). The expert should have (i) a degree in engineering; (ii) at least 10 years of engineering experience or actual working experience in biogas production; and (iii) a good command of English. The expert will undertake the following activities:

- (i) Conduct feedstock survey for biogas production in the project area, and suggest most efficient feedstock collection methods, size of fermenter, and fermentation method.
- (ii) Review draft feasibility study report prepared by the local design institute, and provide suggestions to optimize the technical design.
- (iii) Design the necessary engineering work for interface with gas purification system.

7. **Biogas purification specialist** (international, 2.0 person-months, intermittent). The expert should have (i) a degree in engineering; (ii) at least 10 years of engineering experience or actual working experience in biogas purification technology; and (iii) a good command of English. The expert will undertake the following activities:

- (i) Review draft feasibility study report prepared by the local design institute, and provide suggestions to optimize the technical design.
- (ii) Evaluate selected biogas upgrading method under the draft feasibility study and design the optimal biogas purification method in terms of less environmental impact, economic performance, ease of operation and maintenance, and least energy requirement.
- (iii) Design necessary engineering work for interface with gas distribution system.

8. **Biomass pellets production specialist** (international, 2.0 person-months, intermittent). The expert should have (i) a degree in engineering; (ii) at least 10 years of engineering experience or actual working experience in pelletizing process and/or pelletizing machine; and (iv) a good command of English. The expert will undertake the following activities:

- (i) Conduct survey of availability of raw materials for pellet production in the project area.
- (ii) Design the most appropriate pellet production scheme based on local context including raw materials collection method, material storage, type of pelletizer, and pellet distribution system.
- (iii) Assess appropriateness of pellet as fuel in line with quality standard for the International Organization for Standardization or equivalent People Republic of China's standard.

9. **Biomass specialist** (national, 5.0 person-months, intermittent). The expert should have (i) a degree in engineering; (ii) at least 10 years of engineering experience or actual working experience in biogas and biomass pellets production; (iii) knowledge in the People Republic of China's biomass history and policies, and (iv) a good command of English. The expert will undertake the following activities:

- (i) Translate key technical due diligence reports submitted by the international experts in English to Chinese.
- (ii) Evaluate the technical issues for the project, and suggest for improvement.
- (iii) Suggest the sustainable business model for project implementation, operation, and maintenance considering local situation.
- (iv) Prepare rural biomass and biogas sector assessment report.
- (v) Organize knowledge sharing events in rural biogas and biomass pellet to introduce (a) emerging technologies, and (b) good business practices.

10. **Financial analyst** (national, 2.0 person-months, intermittent). The expert should have (i) a recognized professional accountancy qualification (e.g., Chartered Accountant, Certified Public Accountant, Chartered Financial Analyst); (ii) at least 8 years of working experience including in financial due diligence; and (iii) a good command of English. The expert will undertake the following activities:

- (i) Conduct a financial management assessment of the executing and implementing agencies.
- (ii) Prepare financial projections and conducting financial analysis of the implementing agency.
- (iii) Conduct financial evaluations including sensitivity analyses of project components.
- (iv) Propose relevant financial performance indicators to be incorporated in financial covenants.
- (v) Assess and reach agreement on financial reporting, auditing and public disclosure arrangements for the project.

11. The outline terms of reference for PPTA consultants for the safeguards team are described in paras. 12 to 13.

12. **Social analysis and safeguards specialists** (international, 1.5 person-months, intermittent, and national, 2.0 person-months, intermittent). The experts should (i) have a postgraduate degree in social science, or in any relevant field; (ii) have at least 10 years of working experience for international expert, and at least 8 years for national expert; and (iii) a good command of English. The experts will undertake the following activities:

- (i) Conduct due diligence for social safeguard and, if necessary, prepare social safeguard plan(s) in accordance with ADB's Safeguard Policy Statement (2009) (SPS).
- (ii) Conduct survey to assess the poverty reduction and social benefits including gender issues, health impact, willingness to pay, and affordability issues associated with the project, and identify special measures to enhance benefits for the poor.
- (iii) Prepare stakeholder participation plan and communication strategy.
- (iv) Assess urbanization plan in the project area.

13. **Environmental impact assessment specialists** (international, 3.0 person-months, intermittent, and national, 5.0 person-months, intermittent). The experts should (i) have a postgraduate degree in environmental; (ii) have at least 10 years of working experience in the relevant field for international expert, and at least 5 years for national expert; (iv) have a good understanding in ADB's SPS; and (v) be fluent in English. The experts will undertake the following activities:

- (i) Evaluate environmental impacts of the project, and identify environmental risks, including associated facilities such as livestock farms.
- (ii) Quantify environment benefits, such as emission reduction.
- (iii) Review applicable technical standards for the bio methane system, including safety and emergency procedures.
- (iv) Prepare and submit to ADB an initial environmental examination in English in accordance with ADB's SPS.
- (v) Assess climate change risk to the project.

E. Implementation Arrangements

14. The executing agency will be the Qingdao municipal government and the implementing agency will be Qingdao Energy Group. The TA will be implemented over a 20-month period and is expected to start in 1 February 2017 and be completed in 31 December 2018.

15. The proposed PPTA processing and implementation schedule is listed in Table A3.4.

Table A3.4: Proposed Technical Assistance Processing and Implementation Schedule

Major Milestones	Expected Completion Date
Concept paper approval	September 2016
Consulting services selection	November 2016–January 2017
Implementation consulting services	February–December 2017
Physical completion	December 2018
Financial closure	March 2019

TA = technical assistance.

Source: Asian Development Bank estimates.