### Part I. General Information

#### 1. Mode of Nonlending Assistance

- Grant-financed assistance (specify source)
  - Japan Fund for Poverty Reduction (JFPR)
  - Others

#### 2. Assistance Focus

- **Sector:**
  - Agriculture and Natural Resources
  - Education
  - Energy
  - Finance
  - Health, Nutrition and Social Protection
  - Industry and Trade
  - Law, Economic Management and Public Policy
  - Transport and Communications
  - Water Supply, Sanitation, and Waste Management
  - Multisector

- **Subsector:** energy utility services.

- **Targeting classification**
  - Targeted intervention
    - TI-Household
    - TI-MDG
    - TI-Geographic
  - General intervention

- **Key thematic area(s)**
  - Themes:
    - Sustainable economic growth
    - Inclusive social development
    - Governance
    - Gender and development
  - Subthemes: other vulnerable groups, and urban environmental improvement.

#### 3. Coverage

- Country
- Subregional
- Interregional

#### 4. Responsible Department and Division: East Asia Department, Energy Division

#### 5. Responsible Officer(s): Teruhisa Oi

### Part II. Description of Assistance

#### 1. The Proposed Assistance

- **Link to country/regional strategy.**

  Mongolia has an extremely harsh winter climate, with winter temperatures ranging from \(-10^\circ\text{C}\) to \(-40^\circ\text{C}\) during the daytime in mid-winter. The long and harsh winter requires a long heating season, of approximately 8 months from the middle of September to the middle of May. Administratively, Mongolia is divided into the capital city (Ulaanbaatar), three autonomous cities, 21 *aimags* (provinces) and 314 *soums* (districts).

  The population of the largest *soum* center is less than 10,000 and most of them are located far from the main urban centers, which poses serious challenges in providing basic services to the communities. Although a decade of strong economic growth led by investments in mining sector has substantially boosted average incomes, poverty remains a challenge for Mongolia. Around 30% of the population is still living below the poverty line. Inequality is severe between the urban and rural areas. This also gets reflected in poor and unequal access to essential services like adequate and reliable heating supply in peri-urban and rural areas.

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1. There are 21 *aimags* in Mongolia, and each *aimag* has about 15 *soum* centers.
The current heating practices in soum centers include (i) individual household stoves for residents living in ger (Mongolian traditional tent), and (ii) centralized or decentralized coal-fired heat-only boilers for some apartments and the public buildings such as schools, dormitories, hospitals, and government offices. Existing coal-fired heat-only boilers are old and inefficient, which operates with low combustion efficiency of less than 50%. These boilers are generally not fitted with emission control equipment. These boilers are a major cause of air pollution in soum centers resulting in increased risks of acquiring respiratory and heart diseases, with particularly higher impact on the sick, children, elderly and poor people. Lack of proper heating services and inadequate coverage in most soum centers result in low room temperature in classrooms, dormitories, and hospitals with serious consequences on school and medical services.

Mongolia is rich in solar resources with an average annual irradiation of about 1,350–1,850 kilowatt hour per square meter (m²). Due to its distributed nature, solar power is one of the likely solutions to provide sustainable and cleaner heating services in soum centers.² Heat load of soum centers is in the range of 0.5 to 1 megawatt thermal equivalent, which requires a solar field of 714 to 1,429 m² and costs about $620/m². Central solar heating typically comprises central heating and hot water through arrays of solar thermal collectors (central solar heating plants [CSHPs]) and distributed through district heating pipe networks.³ Compared to small household level solar heating, CSHPs have better price performance due to lower installation costs, higher thermal efficiency, and less maintenance. CSHP is a proven technology and is commercially operated in Denmark and Sweden where climate conditions are similar to Mongolia.³ Availability of vast land combined with near-zero fuel cost during operation and the maintenance will make such solar installations particularly suitable for remote areas in soum centers. Once a solar heating plant is connected to an existing district heating network, the existing coal-fired heat-only boilers can act as back-up system to be used only as peak-load heat source. This will drastically cut coal consumption, associated fuel costs and emissions. These recurring operation cost savings will free up local government’s budget to be used for improving complementary public facilities and other social services.

The proposed grant Solar District Heating Supply Project in Rural Remote Areas will demonstrate CSHPs as cleaner and reliable heating system in one or two pilot soum centers. These pilot soum centers will be selected at the beginning of the project implementation using the proposed selection criteria. The following selection criteria will be finalized during the project processing stage:

(i) closest possible location from Ulaanbaatar for showcasing;
(ii) high poverty incidence;
(iii) soum centers where centralized heating system is adopted;
(iv) soum centers where residential buildings are connected in the centralized heating system;
(v) commitment letter from aimag and soum administration to provide counterpart (including in-kind) contribution for project implementation, and annual operation and maintenance;
(vi) confirmed financial viability and sustainability;
(vii) exclude soum centers which are close to major mining areas;
(viii) no land acquisition and involuntary resettlement required;
(ix) no negative impact on biodiversity, wetland, natural resources, and physical cultural resources;
(x) soum centers where there is sufficient water availability for the project to ensure no changes in water flow regimes caused by the water intake from surface water or underground wells;
(xi) project locations must have adequate distance (at least 100 meter) from any water bodies; and
(xii) project sites must not be located in the areas vulnerable to natural hazards such as earthquakes, floods, landslides, storm surges, and volcanic eruptions.

This will be the first time that such technology will be used in Mongolia. Following completion of the proposed project, residents in soum centers will benefit from better quality of heating services during winter and hot water supply throughout the year, which will benefit around 2,000 people. Providing cleaner and reliable district heating services to schools, dormitories, and hospitals, and government offices will (i) reduce cases of respiratory diseases through improved air quality, (ii) reduce carbon monoxide poisoning by providing safer environment, and (iii) improve school and medical services environment during the winter.

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² To confirm its feasibility, the availability of solar radiation and land will be assessed.
³ Typical operating temperature ranges from low 30°C to high around 100°C.
⁴ About 130 solar thermal plants, with a normal design power of 1 megawatt thermal equivalent or more with a total capacity of 170 megawatt thermal equivalent (240,000 m² of solar-filed), are currently in operation in Europe.
The Government of Mongolia requested the Asian Development Bank (ADB) on 24 April 2013 to support implementing the proposed project. The proposed project is in line with Mongolia’s country partnership strategy, 2012–2016 which identifies improving heating access in remote rural areas as an important area of intervention.

b. Impact
The impact will be improved quality of life in remote rural areas (soum centers).

c. Outcome
The outcome will be cleaner and efficient heating and hot water services are provided to schools, dormitories, hospitals, and government offices in pilot soum centers.

d. Expected outputs and time frame
The outputs will be (i) CSHPs pilot projects constructed in selected soum centers by 2016, (ii) capacity strengthened in operation and maintenance of CSHPs by 2016 and 2017, and (iii) knowledge on appropriate CSHPs system shared by 2017.

e. Potential issues and risks
There is no project preparatory technical assistance attached to the proposed project due to the nature of small scale grant project. Once the selection of pilot soum centers is completed, consultants will be hired and will assess the environment and social impacts in accordance with ADB’s Safeguards Policy Statement (2009) at the beginning of project implementation. The proposed selection criteria (para. 4 of Part II 1a) will ensure that socially and environmentally sensitive project sites will be excluded from the potential pilot project sites. The expected major environmental impacts of the project are (i) soil erosion during construction, (ii) increased noise and dust affecting local residents during construction, (iii) inappropriate storage of hazardous materials and wastes during operation, and (iv) emissions of air pollutants during operation. While the project may have a number of potential impacts and risks, they will be site-specific and can be prevented and controlled through diligent practices and comprehensive mitigation measures. ADB will assist the government in preparing the appropriate safeguards documents, where applicable.

f. Plans for disseminating results.

- Internal
  - Announcement in ADB Today
  - Article in ADB Review
  - Seminar, workshop, brown bag (i.e. a session in Asia Clean Energy Forum)

- External
  - Publication of articles in external journals or books
  - Posting article on adb.org
  - Media plan to be drafted (includes news releases, op-eds, or press briefings, interviews, or tours)
  - Presentation at external conferences
  - Others __________________________

2. Proposed Executing/Implementing Agency or Agencies
The executing agency will be the Ministry of Energy and the implementing agency will be the project management office of the Ministry of Energy.

3. Stakeholder Participation and Consultation:
The Ministry of Energy, the Ministry of Economic Development, the Embassy of Japan in Mongolia, Japan International Cooperation Agency (JICA), and Xac Bank (a local private commercial bank) have been consulted on the project’s concept. It is confirmed that the proposed project will not be a duplication, rather it will complement JICA’s energy sector intervention in Mongolia, which focuses on rehabilitation of main power plant in Ulaanbaatar, whereas the proposed project will focus on heating issue in rural area. The proposed project will

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consider inviting the expert engaged in JICA’s ongoing solar power demonstration project to draw from their experience in operation and maintenance under cold climate conditions. Xac Bank expressed interest in the replication of the proposed project once technical and financial viability are assured.

4. Financing Plan

☑ Trust Fund: $2.5 million
☐ Other:

If cofinancing is required, indicate amount and sources sought: Not applicable.

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB Financing Trust Fund</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Government Financing</td>
<td>250,000</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>2,750,000</strong></td>
</tr>
</tbody>
</table>

Source: Asian Development Bank estimates.

PART III. TIMETABLE FOR ASSISTANCE DESIGN, PROCESSING, AND IMPLEMENTATION

1. Year included in a regional or country operations business plan: to be included in 2013
2. Expected date of submission for approval: September 2013
3. Period and duration of assistance: 41 months from Q1 2014 to Q2 2017

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### DESIGN AND MONITORING FRAMEWORK

<table>
<thead>
<tr>
<th>Design Summary</th>
<th>Performance Targets and Indicators with Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td>Improved quality of life in remote rural areas (soum centers)</td>
<td>Reduced number of cases of respiratory diseases by 15% by 2020</td>
<td>Local hospital’s health record</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Risk</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Assumption</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Risk</strong></td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>Provided cleaner and efficient heating and hot water services to schools, dormitories, hospitals, and government offices in pilot soum center</td>
<td>Reduced coal consumption by 50% by 2017 (baseline: 100% in 2013)</td>
<td>Consultant’s progress report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintained room temperature at 21°C by 2017 (baseline: below 21°C 2013)</td>
<td></td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td></td>
<td></td>
<td><strong>Assumption</strong></td>
</tr>
<tr>
<td>1. CSHPs pilot projects constructed in selected soum centers</td>
<td>Solar heating plant is commissioned by 2016</td>
<td>Grant review missions and consultant progress reports</td>
<td>Sufficient counterpart funds available.</td>
</tr>
<tr>
<td>2. Capacity strengthened in operation and maintenance of CSHPs</td>
<td>Provided on-the-job training during plant operation season in 2016 and 2017</td>
<td></td>
<td>Inadequate capacity of the project implementing agency.</td>
</tr>
<tr>
<td>3. Knowledge on appropriate CSHPs system shared</td>
<td>Held at least three information sharing workshops by 2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activities with Milestones</strong></td>
<td><strong>Inputs</strong> Trust Fund ADB: $2.5 million</td>
<td><strong>Item</strong></td>
<td><strong>Amount ($ million)</strong></td>
</tr>
<tr>
<td>1. Solar heating and hot water supply plant constructed</td>
<td>Pilot project</td>
<td>1.33</td>
<td></td>
</tr>
<tr>
<td>1.1 Inventory survey of potential soum centers for replication (Q1 2014).</td>
<td>Consulting services</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>1.2 Detailed design (Q2 2014).</td>
<td>Training and workshops</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>1.3 Environment and social impact assessment (Q2 2014).</td>
<td>Grant management</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>1.4 Bid documents preparation and tendering (Q4 2014).</td>
<td>Other inputs</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>1.5 Financial and economic analysis (Q1 2014).</td>
<td>Contingencies</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>1.6 Bid evaluation and contract award (Q2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>2.50</td>
<td></td>
</tr>
</tbody>
</table>
### Design Summary

<table>
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<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7 Procurement (from Q3 to Q4 2015).</td>
<td>Implementing agency: $0.25 million</td>
<td></td>
</tr>
<tr>
<td>1.8 Monitoring of construction activities (from Q2 to Q3 2016).</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>1.9 Inspection and acceptance of the plant (Q3 2016).</td>
<td>Amount ($ million)</td>
<td></td>
</tr>
<tr>
<td>1.10 Commencement of operation (Q4 2016).</td>
<td>Counterpart staff</td>
<td>0.25</td>
</tr>
<tr>
<td>1.11 Participatory community awareness raising for community safety (Q3 2016 and Q1 2017).</td>
<td><strong>Subtotal</strong></td>
<td>0.25</td>
</tr>
<tr>
<td>1.12 Social and environment impact survey (Q1 2017).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **Capacity in operation and maintenance strengthened**

   2.1. On-the-job operation and maintenance training (from Q3 2016 to Q1 2017).

3. **Knowledge on CSHPs system shared**


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% = percentage, ADB = Asian Development Bank, CSHP = central solar heating plant, Q = quarter.

Source: Asian Development Bank estimates.
### INITIAL POVERTY AND SOCIAL ANALYSIS

<table>
<thead>
<tr>
<th>Country:</th>
<th>MON</th>
<th>Project Title:</th>
<th>Solar District Heating Supply Project in Rural Remote Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lending/Financing Modality:</td>
<td>Trust Fund Project</td>
<td>Department/Division:</td>
<td>EAEN</td>
</tr>
</tbody>
</table>

#### I. POVERTY IMPACT AND SOCIAL DIMENSIONS

**A. Links to the National Poverty Reduction Strategy and Country Partnership Strategy**

The government’s poverty reduction strategy is defined in the National Development Strategy which identifies the development of regions and infrastructure to reduce urban-rural disparities as one of the six main priorities. The government also announced *Soum* Development Strategy in February 2013 to support small- and medium-size enterprise development in *soum*, which aims to increase employment opportunities and improve rural living standards. The proposed project is also in line with Mongolia’s country partnership strategy, 2012–2016 which identifies improving heating access in remote rural areas as an important area of intervention.

**B. Targeting Classification**

- General Intervention
- Individual or Household (TI-H)
- Geographic (TI-G)
- Non-Income MDGs (TI-M1, M2, etc.)

The proposed project will indirectly address poverty reduction by providing reliable and cleaner district heating services to schools, dormitories, hospitals, and government offices in remote rural areas.

**C. Poverty and Social Analysis**

1. **Key issues and potential beneficiaries.**

   The harsh climate and long winter season in poor remote areas in Mongolia make heating an absolute requirement for sustaining life. The current heating practices in *soum* centers include (i) individual household stoves for residents living in ger (Mongolian traditional tent), and (ii) centralized or decentralized coal-fired heat-only boilers for some apartments and the public buildings such as schools, dormitories, hospitals, and government offices. Existing coal-fired heat-only boilers are old and inefficient, which operates with low combustion efficiency of less than 50%. These boilers are generally not fitted with emission control equipment. These boilers are a major cause of air pollution in *soum* centers resulting in increased risks of acquiring respiratory and heart diseases, with particularly higher impact on the sick, children, elderly and poor people. Lack of proper heating services and inadequate coverage in most *soum* centers result in low room temperature in classrooms, dormitories, and hospitals with serious consequences on school and medical services. The project will provide cleaner and reliable heating services by introducing solar district heating system. Beneficiaries of heating services are residents in *soum* centers, including the poor and vulnerable population (patients and students). There are no constraints in accessing the proposed benefits and services by the poor and vulnerable population as heating cost is covered by the *soum* center government’s budget. Poverty ratio in *soum* centers according to the National Statistical Office of Mongolia is 42.6%.

2. **Impact channels and expected systemic changes.**

   The poor and vulnerable population will receive better school and medical environment by providing cleaner and efficient heating service.

3. **Focus of (and resources allocated in) the PPTA or due diligence.**

   At the initial stage of grant project implementation, the social specialist will collect relevant social and poverty data and collect baseline information through survey and interview on existing heating quality and services in selected pilot *soum* center.

#### II. GENDER AND DEVELOPMENT

1. **What are the key gender issues in the sector/subsector that are likely to be relevant to this project or program?**

   There are no gender issues relevant to the proposed project.

2. **Does the proposed project or program have the potential to make a contribution to the promotion of gender equity and/or empowerment of women by providing women’s access to and use of opportunities, services, resources, assets, and participation in decision making?**

   Yes ☐ No ☑ Please explain.

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3. Could the proposed project have an adverse impact on women and/or girls or widen gender inequality?
   - Yes
   - No
   Please explain.

4. Indicate the intended gender mainstreaming category:
   - GEN (gender equity theme)
   - EGM (effective gender mainstreaming)
   - SGE (some gender elements)
   - NGE (no gender elements)

III. PARTICIPATION AND EMPOWERMENT

1. Who are the main stakeholders of the project, including beneficiaries and negatively affected people? Identify how they will participate in the project design.
   The stakeholders are the Ministry of Energy, the Ministry of Economic Development, soum center government, and the residents of soum center.

2. How can the project contribute (in a systemic way) to engaging and empowering stakeholders and beneficiaries, particularly, the poor, vulnerable and excluded groups? What issues in the project design require participation of the poor and excluded?
   The opinions and suggestions relevant to the project collected from the poor, vulnerable, and excluded groups, through the public consultations, will be incorporated in the project design.

3. What are the key, active, and relevant civil society organizations in the project area? What is the level of civil society organization participation in the project design?
   - Information generation and sharing
   - Consultation
   - Collaboration
   - Partnership
   There is no relevant civil society organization in the proposed project area.

4. Are there issues during project design for which participation of the poor and excluded is important? What are they and how shall they be addressed?
   - Yes
   - No

IV. SOCIAL SAFEGUARDS

A. Involuntary Resettlement Category

1. Does the project have the potential to involve involuntary land acquisition resulting in physical and economic displacement?
   - Yes
   - No
   The pilot projects will be selected at the beginning of project implementation based on the selection criteria. The selection criteria will be established during the grant processing and will exclude potential pilot project sites which entail involuntary resettlement, land acquisition and economic displacement. Also, abundant vacant state-owned land is available to locate the CSHPs in most of the soum center. Heat load of soum centers is ranging from 0.5 to 1 megawatt thermal equivalent, which required solar field of 714 to 1,429 square meters.

2. What action plan is required to address involuntary resettlement as part of the PPTA or due diligence process?
   - Resettlement plan
   - Resettlement framework
   - Social impact matrix
   - Environmental and social management system arrangement
   - None

B. Indigenous Peoples Category

1. Does the proposed project have the potential to directly or indirectly affect the dignity, human rights, livelihood systems, or culture of indigenous peoples?
   - Yes
   - No
   The pilot projects will be selected at the beginning of project implementation based on the selection criteria. Selection criteria will be established during the grant processing and will exclude the potential pilot project sites which affect directly or indirectly the dignity, human rights, livelihood systems, or culture of ethnic minorities.

2. Does it affect the territories or natural and cultural resources indigenous peoples own, use, occupy, or claim, as their ancestral domain?
   - Yes
   - No
   The selection criteria will exclude potential pilot project sites which affect the territories or natural and cultural resources ethnic minorities own, use, occupy, or claim, as their ancestral domain.

3. Will the project require broad community support of affected indigenous communities?
   - Yes
   - No

4. What action plan is required to address risks to indigenous peoples as part of the PPTA or due diligence process?
   - Indigenous peoples plan
   - Indigenous peoples planning framework
   - Social Impact matrix
   - Environmental and social management system arrangement
   - None

V. OTHER SOCIAL ISSUES AND RISKS

1. What other social issues and risks should be considered in the project design?
   - Creating decent jobs and employment
   - Adhering to core labor standards
   - Labor retrenchment
2. How are these additional social issues and risks going to be addressed in the project design?

Standard assurances on core labor standards will be included in the grant project agreement.

### VI. PPTA OR DUE DILIGENCE RESOURCE REQUIREMENT

1. Do the terms of reference for the PPTA (or other due diligence) contain key information needed to be gathered during PPTA or due diligence process to better analyze (i) poverty and social impact; (ii) gender impact, (iii) participation dimensions; (iv) social safeguards; and (vi) other social risks. Are the relevant specialists identified?

   ☒ Yes  ☐ No

2. What resources (e.g., consultants, survey budget, and workshop) are allocated for conducting poverty, social and/or gender analysis, and participation plan during the PPTA or due diligence?

   Two person-months of social specialist (one international and one national) will be allocated in the grant project.

CSHP = central solar heating plant.
OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. A consulting firm comprising of international and national consultants (5 international for 25 person-months, and five national for 26 person-months) will be recruited by ADB in accordance with ADB’s Guidelines on the Use of Consultants (2010, as amended from time to time) through the quality and cost-based selection procedure (90:10) to provide the services for implementation, management, and progress monitoring of the Project. The terms of reference will include, but not be limited to, the following:

A. International Consultants

2. District heating specialist and team leader (12 person-months, intermittent). The expert should have a postgraduate degree in heating engineering, or in another relevant field; and at least 15 years of working experience in district heating. The expert will undertake the following activities:

   (i) Take leadership role for the technical advisory team and coordinate with all experts on their respective assignments to ensure quality of work.
   (ii) Be responsible for the overall technical issues and undertakings during the bid selection process.
   (iii) Write the technical part of the pre-qualification documentation that will be released to prospective bidders.
   (iv) Participate in the bidder's conference, assist in drafting responses to questions and clarifications sought by the bidders.
   (v) Provide advice in (i) identifying and selecting the shortlist of consortia during the pre-qualification stage, and (ii) evaluating the technical portions of the pre-qualification documentation.
   (vi) Be responsible for reviewing technical sections of request for proposal.
   (vii) Review, assess, and score the technical portions of the proposal received from bidders, including seeking clarifications from bidders.
   (viii) Participate in negotiation with the preferred bidder.
   (ix) Assist in drafting project implementation guidelines.
   (x) Supervise project implementation.
   (xi) Provide other technical advice, as required.
   (xii) Organize knowledge sharing sessions.
   (xiii) Organize trainings on operation and maintenance and community safety.
   (xiv) Prepare all progress reports.

3. District heating specialist (8 person-months, intermittent). The expert should have a postgraduate degree in heating engineering, or in another relevant field; and at least 15 years of working experience in district heating in integrated renewable energy systems. The expert will undertake the following activities:

   (i) Be responsible for the technical service related to integration of solar thermal plant.
   (ii) Participate in the bidder’s conference, assist in drafting responses to questions and clarifications sought by the bidders.
   (iii) Support the team leader in drafting and issuing the detailed technical performance-based output specifications for the project.
   (iv) Prepare technical specification on solar heating facility required for technical sections of request for proposal.
(v) Review, assess, and score the technical portions for solar thermal plant of the proposal received from bidders, including seeking clarifications from bidders.

(vi) Provide other technical advice, as required by the team leader.

(vii) Organize a workshop at least once during the non-heating season to share the activities conducted in selected soum centers.

(viii) Create an introductory project document for wider information dissemination through the media.

4. **Environment specialist** (3 person-months, intermittent). The expert should have a postgraduate degree in environment management or in any relevant field; and at least 10 years of working experience on environmental impact assessment. The expert will undertake the following activities:

(i) Review all document relevant to the proposed project, including relevant national laws and regulations and a national environmental impact assessment report.

(ii) Conduct site visit and primary data collection, if necessary, to evaluate environmental impacts of the proposed project.

(iii) Prepare an initial environmental examination (IEE) report of the proposed project and ensure the report meets Asian Development Bank’s (ADB’s) Safeguard Policy Statement (2009) requirements. Recommend environmentally-friendly technologies and methods to be incorporated in the design and construction of the proposed project, especially taking into account (a) biodiversity conservation, (b) public health and safety, (c) physical cultural resources, (d) pollution prevention and abatement, and (e) climate change mitigation and adaptation. These aspects shall be documented and incorporated in the IEE report.

(iv) Assess the capacity of the executing agency and implementing agency on environmental assessment, management, and monitoring; and recommend required measures for capacity building.

(v) Identify areas for improvement and training needs with respect to the environmental safeguards under the project and based on this, prepare and submit training materials and conduct the training workshop to the staff of the executing agency, implementing agency and other stakeholders on environmental management and safeguard.

(vi) Identify environmental risks and propose a set of mitigating measures during the project construction and operation.

(vii) Assist the executing and implementing agencies in preparing a sound environment management plan (EMP), appropriate monitoring requirements to assess the environmental impact of the project construction and operation, and establish a grievance redress mechanism.

(viii) Review cost implications of the proposed environmental mitigation measures and implementation of the EMP.

(ix) Prepare a list of activities and budget requirements for EMP monitoring during project implementation.

(x) Assist the executing agency and implementing agency in stakeholders participation and consultation during IEE preparation and disclosure of relevant information.

(xi) Establish environmental baseline indicators and performance targets.

(xii) Together with the district heating expert, assess and quantify environment benefits such as energy efficiency improvements, greenhouse gases emission reduction, and other associated environmental benefits.

(xiii) Submit the English IEE report to ADB and incorporate ADB’s comments on the IEE report, revise, update and/or refine the IEE, if required.
Appendix 3

Prepare and submit draft templates of EMP monitoring report both in English and Mongolian.

Provide a clear guidance on how to prepare EMP reports to the executing agency and implementing agency, so that they are comfortable to diligently fulfill the monitoring requirement throughout the project implementation.

5. Financial and economic analyst (1 person-month, intermittent). The expert should have a postgraduate degree in finance or economics, and at least 5 years working experience. The expert will undertake the following activities:

(i) Conduct financial analysis of the pilot project and prepare the projected financial statements (balance sheet, income statement, and statement of cash flows) for the next 5 years.¹

(ii) Assess the financial management capabilities and internal controls of the pilot soum center ² and make recommendations for institutional strengthening and capacity building.

(iii) Prepare the financial section of the project progress report.

(iv) Perform the economic analysis for the proposed project and subprojects, guided by ADB’s Guidelines for the Economic Analysis of Projects (1997) specifically including (a) heating demand analysis, (b) least-cost and equalizing discount rate analysis, (c) economic viability analysis, and (d) risk analysis. Discuss alternative methodologies for carrying-out the economic analysis.³

(v) Assess the willingness-to-pay for heating by consumers in the project area in consultation with the social specialist, based on sample survey of energy consumed, price paid by households, and household income.

(vi) Incorporate into the economic analysis an economic quantification of environmental impact following ADB’s Economic Valuation of Environmental Impacts: A Workbook (1996), and Environmental Assessment Guidelines (2003).⁴

(vii) Provide quantitative and qualitative benefits of the proposed project and each of its components.

(viii) Review the tariff structures, billing and revenue collection systems, and recommend necessary changes to ensure future financial sustainability, with an analysis of possible barriers to change.


Interest Rate (ADB Loan): As indicated in the ADB Guidelines for estimate of interest during construction (IDC), the 5-year LIBOR swap rate should be used, while for the financial projections, the 10-year LIBOR swap rate should be applied. ADB's lending spread of 0.30% per annum should be added for loans negotiated from 1 July 2010 to 30 June 2011, and 0.40% per annum for those negotiated on or after 1 July 2011. Updates on indicative LIBOR can be obtained from the ADB's website at http://www.adb.org/Documents/Brochures/Libor/indicative_rates.pdf

Interest Rate (Domestic Loan): This should be obtained by the national consultant from the subproject enterprises. In other ADB projects, the prevailing rate for long-term loans issued by the People's Bank of China is used for projection purposes.

Commitment Fees: Commitment fees are computed at 0.15% p.a. of the total undisbursed balance of the loan. There are no front-end fees.

Cost Escalation Factors: For price contingency estimates, the ADB suggested cost escalation factors should be used. Updates can be obtained at: http://fndbg1.asiandevbank.org/erd0004p.nsf/


6. **Social specialist** (1 person-month, intermittent). The experts should have a postgraduate degree in social science, or in any relevant field; and at least 10 years of working experience. The expert will undertake the following activities:

   (i) Visit the pilot project site and assess the land acquisition impact and prepare land acquisition plan, if required, in accordance with ADB’s Safeguard Policy Statement.

   (ii) Collect basic socioeconomic indicators such as (a) total population and households, (b) total female-headed households, (c) poverty ratio, (d) major industries and sources of income, (e) incidence of carbon monoxide poisoning and respiratory diseases, and (f) number of heating beneficiaries by subprojects disaggregated by gender and newly and existing connected households, in all subproject areas and the province.

   (iii) Assess the willingness-to-pay for heating by consumers and gender in the project area in consultation with the economist, based on sample survey of energy consumed, price paid by households, and household income.

   (iv) Assess affordability issues related to heating supply for the poor and female-headed households, review the current practices to help reduce the burden of the poor on heating tariff, recommend pro-poor and gender activities that could be included in the project and would directly benefit the poor and female-headed households in the project cities.

   (v) Assess the project’s impact on health including avoided carbon monoxide poisoning and respiratory diseases by using coal stove, paying attention to the gender difference.

   (vi) Confirm that the project does not have any impact on ethnic minorities.

B. **National Consultants**

7. The national consultants will comprise of (i) district heating specialist and a deputy team leader (12 person-months), (ii) district heating specialist (8 person-months), (iii) environment specialist (3 person-months), and (iv) social specialist (1 person-month). They will work with the corresponding international consultants and provide assistance to support each international consultant.

8. The procurement specialist (2 person-months) should have a postgraduate degree in engineering, business administration or in any relevant field, and at least 5 years working experience with strong familiarity in ADB’s procurement and disbursement procedures. The expert will support the team leader and undertake the following activities:

   (i) Prepare the bill of quantity and bidding documents for the procurement of goods and civil works, in accordance with ADB’s Procurement Guidelines (2010, as amended from time to time).

   (ii) Prepare bid evaluation report.

   (iii) Monitor the procurement activities.

C. **Reports**

9. The consulting firm shall submit the following reports to ADB (in English) and the government (in Mongolian):

   (i) **Inception report.** It will be submitted within 4 weeks after the commencement of the services. The report includes a detailed work program and any major
inconsistencies in the terms of reference, staffing problems or deficiencies in the government’s assistance.

(ii) **Interim report.** It will be submitted within 16 weeks after the commencement of the services. The report includes the preliminary result of activities, updated work program, and any issues and concerns.

(iii) **Draft final report.** It will be submitted within 24 weeks after the commencement of the services. A workshop will be held, attended by relevant stakeholders, to get feedback on the report within 6 weeks after the submission of the draft final report.

(iv) **Final report.** It will be submitted within 18 weeks after receipt of comments from ADB and the government on the draft final report. The final report shall take into consideration the comments of ADB and the government. A maximum of 10 pages summary report should be included in the final report.