**Belarus Biomass District Heating Project**

**Design and Supervision Consultancy Services**

**Terms of Reference for Performance**

1. **Background:**

The Government of the Republic of Belarus has requested loan financing from the International Bank for Reconstruction and Development (hereinafter “the IBRD”) to support the implementation of the Biomass District Heating Project (hereinafter “the Project”).

The Project development objective is to scale up the efficient use of renewable biomass in heat and electricity generation in selected towns in Belarus.

The Project implementation period is from 16.05.2014 to 31.12.2019

1. **General characteristics of the Project activities:**

The Project is expected to improve the energy efficiency of district heating and increase the use of local wood biomass (replacing natural gas for base-load heat generation) in 13 district heating systems (towns/settlements) of the Republic of Belarus.

The Project has the following three components:

**I: District Heating Energy Efficiency**

(a) *Modernization and/or construction of heat substations* by installing individual building-level heat substations with temperature controls. Historically, most Belarusian district heating companies have delivered heat using centralized heat substations. Converting centralized heat substations to individual building-level heat substations would better match heat supply to demand at the building level, thus improving heat supply efficiency and the quality of heat service.

(b) *Reconstruction and/or construction of district heating networks, upgrading of outdated gas boilers houses and/or installation of new peak-load gas boilers.* The reconstruction of heat networks would include replacing obsolete heat pipes that have large heat and water leaks with preinsulated heat pipes and constructing new heat networks.

**II: Biomass Heat Generation**

This component would include investment in base-load biomass boilers, biomass-based small combined heat and power (CHP) plants, and in some towns also wood chipping equipment.

(a) *Biomass boilers and CHP plants*. This component would support investments in base-load biomass boilers or small CHP plants using wood chips or wood wastes as the main fuel, to replace existing base-load gas or oil boilers. The investments would cover the design and construction of boiler houses, boilers, and ancillary equipment.

(b) *Wood chipping equipment and biomass fuel storage facilities.* Wood biomass would be harvested by certified forestry enterprises. If forestry enterprises supply only wood logs, the project would finance the purchase of wood chippers. The Project would also finance the construction of biomass storage facilities near the boiler houses.

**III: Capacity Building, Project Management, Monitoring and Evaluation**

This component would finance capacity building for the participating district heating utilities and implementation support to the Project Management Unit (PMU) (RUE “Belinvestenergosberezhenie”), including the following:

1. *Improvement of existing social accountability mechanisms.* The Project would support participating utilities to communicate more proactively with their customers and increase the efficiency of the handling of grievances. The Project would also support the monitoring by consumer groups on continuous information provision on all aspects of the service delivery.
2. *Support for a shift to energy-content-based biomass pricing.* In Belarus, wood biomass pricing is based largely on volume—solid cubic meters of raw material. The Project would provide technical assistance to support a government effort to move toward pricing based on the energy content of the timber (that is, a unit price per gigajoule or MWh of delivered biomass), including financing the purchase of equipment to measure the energy content of biomass.
3. *Other project implementation support*. This would include (i) implementation support consultancy to support the PMU and the district heating utilities in the implementation and supervision of the project; (ii) training and capacity building for the utilities based on international best practices for energy efficiency improvements in district heating and proven biomass technologies; (iii) annual financial audits of the project accounts; and (iv) other consultancy services.
4. **Objective of the assignment:**

The objective of the Consultant assignment is to provide implementation consultancy support to RUE “Belinvestenergosberezhenie” (hereinafter “the Client”) and to the site owners of the district heating systems during the preparation, implementation and supervision of the Project.

1. **Scope of Work:**

The Scope of Work of the Consultant is outlined below. During performance of consultancy services the Consultant jointly with the Client shall cooperate with structural departments of oblast executive committees, local administration (district executive committees), district heating utilities and managers of the facilities. The representatives of the utilities management, which own the facilities, are responsible for issuance of permits, technical specifications and initial data for the facilities.

The work of the Consultant is structured in four separate tasks described in the following sections.

The scope of work is divided into four Tasks:

* + - Task A, relates to preparation of simple cost benefit economic analysis to assess economic indicators, environmental benefits;
    - Task B relates to procurement and contract negotiations;
    - Task C relates to supervision of implementation, and;
    - Task D relates to monitoring and evaluation of the project’s results.

# Task A. Preparation of economic analysis for sub-projects

Under this task the Consultant shall:

1. Verify the actual heat demand of district heating systems and optimize the size and location of the biomass boiler(s) taking into account the requirements of winter and summer operation.
2. Preparation of simplified economic cost benefit analyses of expenditures and calculation of economic indicators (payback period, ERR, NVP) of the sub-projects.
3. Analyses of expected environmental impact of sub-projects;
4. Prepare recommendations (conclusions) on the most energy efficient sub-projects with cost estimates for implementation at each project site.

# Task B. Preparation of project design documentation, bidding documents and technical specifications

Under this task the Consultant shall:

1. After the approval of the optimized plant and distribution concept by the Client, the consultant shall prepare technical specifications for the bidding documents, including technical requirements for equipment, functional specifications, dimensions and quantities, and principle schemes and drawings as may be needed by the bidders to prepare their bids. The bidding documents for the design, supply and installation contract will require that the Contractor will be responsible to prepare the detailed technical design, and obtain necessary approvals and as-built drawings of the heating plants and networks etc. based on the supplier’s equipment.
2. Provide advice on the appropriate bidding packaging for the above mentioned components to be procured in accordance with the Bank’s Standard Bidding Document (SBD) for Design, Supply and Installation of equipment (single-stage bidding) and update the procurement plan jointly with the Client.
3. Review and streamline the procurement routines and organization to facilitate a project implementation according to the approved implementation plan.
4. Assess training needs of the Client and site owners’ staff for operation, maintenance, and environmental management of the heat plant, and incorporate these requirements into the relevant bidding documents;
5. Assess environmental and safety issues arising from the investment program and recommend necessary mitigating measures to be implemented during construction and subsequent operation of the plant to ensure compliance with national and World Bank standards. The requirements of satisfactory implementation of mitigation measures should be incorporated into the bidding documents and;
6. Prepare safety at work program, fire fighting, environmental requirements during project implementation;
7. Prepare requirements for dismantling, sorting, and storing of the removed equipment and materials;
8. Assist the Client to conduct all steps of the procurement process including publishing of procurement notices, pre-bid meetings and site visits, issuing the bidding document,
9. Assist the Client in the bid openings, clarifications during bidding process and preparation of bid evaluation reports,
10. Assist the Client in preparation of contract agreement, possible amendments etc.

**Task C. Project Implementation Supervision**

Under this task the Consultant shall:

1. Carry out managing and supervising of the investment program (design supervision and supervision of works, equipment quality and installation) in accordance with international practices for project management and applicable local law;
2. Monitor Suppliers’ and Contractors’ implementation activities and ensure compliance with the contract terms and overall scope of the investment program and controlling the quality of supplied equipment and installation works;
3. Review Contractors actual progress and in case of unsatisfactory progress by the contractors advise the Client the necessary remedial steps;
4. Review Contractor’s claims for scope changes or other possible events that may impact the budget, invoices for payments and performance or time schedule and where relevant ensure that settlements are conducted on a fair and reasonable basis;
5. Advise the Client on the certificates and permits required for the project; ensure that all required operating manuals or other documents have been made available and are in satisfactory order;
6. Advise whether all necessary guarantees have been furnished by the suppliers and contractors and are adequate to cover the contractor’s liabilities and obligations;
7. Assess Contractors’ completion reports or other completion procedures, advise on methods for inspection, trials, and acceptance and accordingly advise whether completion is satisfactory and identify deficiencies, if any, to the required standards and recommended actions to rectify the deficiencies;
8. Ensure that the quality of supplied equipment and performed works comply with the quality requirements of the bidding documents;

# Task D. Evaluation and Monitoring

Under this task the Consultant shall:

1. Assist the Client in preparing a detailed evaluation, monitoring plan, and methodology how to identify, measure and demonstrate the benefits of the investments for each subproject.
2. Develop of forms of initial information schedules before and after implementation of the activities;
3. Assess the Project impact on environmental and energy efficiency indicators;
4. Collect and analyze data on energy consumption semi-annually: (i) heat energy, (ii) electric power before and after implementation of activities at the facilities under the Project;
5. Calculation of economic and environmental effect obtained through implementation of activities in each oblast and throughout the Republic of Belarus;
6. **Schedule and Outputs**

Prior to preparing its proposal and starting work, the Consultant is advised to visit Belarus to get familiarized with the Client’s energy system and its major problems and to meet with the representatives of the Client.

The Consultancy should start as soon as the necessary arrangements can be made; it is expected that initiation should be made approximately in the beginning of June 2014. It is estimated that the Consultancy will be required over the whole implementation period until end-2019.

All documents prepared by the Consultant should be issued in one paper copy and in electronic form in Russian and English language.

1. **Qualification of Key Personnel**

The Consultants key personnel will require expertise in the project management, district heating, biomass boilers, combined-heat-and-power, energy efficiency measures, and procurement in regions with the climate similar to that of the Republic of Belarus or to the climate of the countries of Central and Eastern Europe. The key personnel should have university level degrees and at least 5-10 years experience in their fields. In addition to the Key personnel, the consultants should have staff with expertise in the areas of energy efficiency, automation and control, water treatment, economics, and environmental analysis.

Experience in implementation of similar projects financed by international financial institutions, such as the International Bank for Reconstruction and Development, would be a plus. Knowledge of the local law, which is proved by the business contacts with the partners in the Republic of Belarus (contracts, agreements), is desirable.

The Consultant must submit references (at least 4) regarding provided consulting services, supervision and implementation of advanced technologies in the areas of:

* + - Utilization of biomass for heat and electric power production in settlements;
    - Designing, resources saving and energy efficiency;
    - Construction of heat sources and heat power transfer system;
    - Commissioning of the facilities;
    - Supervision over energy efficiency and efficiency coefficient of the district heating systems.

Requirements to the qualification of the main staff:

**Project Manager:** university degree in engineering with specialization in heat supply and civil construction, at least a 10-year practical experience and at least a 5-year managerial experience. Work experience in the countries of Central and Eastern Europe is extremely preferred. Managerial experience in implementation of projects financed by international financial institutions will be an additional bonus. Knowledge of English and Russian is desirable.

**Two Senior Engineers:** university degree in engineering with specialization in heat and water supply. At least a 5-year experience in implementation of similar projects is required. Experience in designing and installation of CHPs and boiler-houses using biomass (domestic) fuels is of particular importance. Knowledge and work experience in the countries of Central and Eastern Europe and knowledge of Russian is required. Work experience in the Republic of Belarus is an additional advantage.

**Economist:** university degree in economics with specialization in economics in power-generating sector and environmental economics. At least a 5-year work experience in analysis of energy efficiency projects. Work experience in the countries of Central and Eastern Europe and knowledge of Russian and English are exceptionally preferred.

**Environmental professional:** university degree with specialization in environmental protection and efficient use of natural resources, at least a 5-year work experience. Work experience in assessment of impact on environment of alternative energy sources is required. Work experience in the countries of Central and Eastern Europe as well as knowledge of Russian and English are exceptionally preferred.

**Local staff in Belarus (incl. external support)**: a group of engineers, economists, ecologists, an interpreter and a secretary.