I. Introduction and Context

Country Context

After a decade of strong economic growth, Belarus has faced recurring macroeconomic turmoil in recent years. Loose fiscal and monetary policies in 2010 generated a short-term economic recovery but resulted in a widening current account deficit (15 percent of GDP in 2010) and heightened pressure on foreign exchange reserves. This put the economy into a tailspin during much of 2011, leading to loss of control of the exchange rate and sharply accelerating inflation. After a period of multiple exchange rates and severe foreign exchange liquidity constraints, the Belarusian rubel lost close to 70 percent of its value relative to the U.S. dollar and inflation soared to 109 percent in...
Authorities addressed the crisis through a combination of tightened macroeconomic policies and a new, more favorable energy deal with the Russian Federation. Together, these measures stabilized the economy. Growth declined to 1.5 percent in 2012 (from 5.5 percent the previous year). Inflation was contained but remained high in regional comparison at 21.9 percent during 2012. Strong export growth, especially during the first half of the year, and terms-of-trade gains reduced the current account deficit to 2.8 percent in 2012. But external pressures reemerged during the initial months of 2013, which saw a significant decline in export revenue.

Macroeconomic stability is expected to remain fragile. Imbalances could reemerge if macroeconomic policies are loosened prematurely in pursuit of high growth and especially if underlying structural problems—such as stagnant productivity, loss of competitiveness, and excessive reliance on external financing and cheap energy imports—are not addressed. In step with continued stabilization-oriented macroeconomic policies, structural reforms to reduce the role of the state, transform the state-owned enterprise sector, and promote private and financial sector development and integration into the global economy are crucial for Belarus to realize its growth potential.

**Sectoral and Institutional Context**

Lacking a sufficient energy resource base, Belarus relies heavily on imported energy resources (mostly oil and natural gas) to meet domestic energy demand. Annual costs related to energy imports amount to about 22 percent of GDP. The main source of imports is Russia. Natural gas is the dominant fuel in Belarus’s energy mix, and about 80 percent of heat and electricity is produced from gas imported from Russia.

Viewing energy services as a social good, the government subsidizes electricity, gas, and district heating for households. District heating tariffs are currently at about 11–17 percent of cost-recovery levels, depending on the heat producer. The fiscal cost of underpriced energy amounts to about 2 percent of GDP annually. There is also a complex system of cross-subsidization between nonresidential and residential consumers and between heat and electricity.

Although Belarus has imported energy from Russia at below-world-market prices, the import price of natural gas has been rising sharply in recent years, increasing from US$47 per thousand cubic meters (TCM) in 2005 to US$263.50 per TCM in 2011. (The most recent energy trade agreement with Russia, concluded in late 2011, reduced the gas import price for 2012–14 to US$165.60 per TCM.) In response to rising energy costs and to generate fiscal savings, the government plans to eliminate cross-subsidization and achieve fully cost-recovering residential electricity and gas tariffs by 2015. Residential heating tariffs are expected to reach 60 percent of cost-recovery levels by 2015.

**Key Issues**

1. Affordability of district heating after cost-reflective pricing reform. Depending on the scenario for natural gas prices, residential heating tariffs could increase by 112–256 percent in real terms after the removal of subsidies. The Public Expenditure Review conducted by the World Bank for Belarus in 2011 estimated that as a result of the planned increase in residential energy tariffs, the national poverty rate could increase from 5.4 percent in 2009 to about 6.3–7.2 percent in 2014. That is, without remedial actions, up to 190,000 additional people in Belarus could fall into poverty.
(2) Vulnerability to gas price shocks and supply disruption. Heavy dependence on imported energy from a single source exposes Belarus to greater energy price volatility and supply disruption risks. In 2010, for example, deteriorating relations with Russia led to the temporary removal of discounts on energy imports from that country, sharply increasing the current account deficit and contributing significantly to the 2011 foreign exchange crisis. Over time, gas import prices are expected to return permanently to market levels, affecting the balance of payments and fiscal situation if remedial measures are not taken in advance.

(3) High energy and carbon intensities compared with countries in the European Union. Despite remarkable progress in reducing energy intensity (with a 45 percent decrease from 2000 to 2010), Belarus still lags behind the EU-27 countries, whose average energy and carbon intensities are about half those of Belarus. In the district heating sector the financing of energy efficiency investment has been limited. Energy efficiency measures widely used in district heating systems in Western Europe—such as automated building-level heat substations, which on average reduce energy consumption by 15–25 percent compared with group heat substations—have received only limited application in Belarus.

(4) Underutilized potential of biomass resources. Forests are one of Belarus’s richest natural resources. They cover about 39 percent of the country’s land area—the fifth largest share in Europe and Central Asia. Although forests have been efficiently and professionally managed to a high standard, there is room to further explore their potential for contributing to economic growth. The forestry sector in Belarus contributed 2.1 percent of GDP in 2011 (World Bank, Belarus Forestry Policy Note, 2013), compared with 3–5 percent for the more developed forestry industries of Scandinavia and Canada. Using low-quality wood, now treated as industrial waste, for heat and power generation could promote the development of the wood processing industry, encourage sustainable forest management, and create new job opportunities.

Belarus has abundant biomass resources, spread relatively evenly across the country. The price of local biomass is about half the 2013 price of imported natural gas on an energy-equivalent basis even without taking into account the environmental benefits of renewable energy. This price difference will widen with the projected increase in future gas prices. Improving the energy efficiency of heat generation and scaling up the use of biomass fuel would therefore help address the challenges in the energy sector mentioned here—by reducing energy production costs, diversifying energy supply, and further unlocking the potential of forestry resources in Belarus.

Rationale for Bank Involvement
The World Bank has worked with Belarus on energy and energy saving issues since the late 1990s. The Belarus Energy Efficiency Department and its Project Management Unit are familiar with the Bank’s procedures and regulations and have a positive track record working with the World Bank on two-demand side energy efficiency projects: the Social Infrastructure Retrofitting Project and the Post Chernobyl Recovery Project; and on one supply side power and heat generation: the Energy Efficiency Project.

By 2011 there were approximately 3,000 biomass boilers installed in Belarus. Most of them (at least 90 percent) are less than 1 megawatt (MW), however, and are mainly manually loaded with wood logs. Implementation of the proposed project would help scale up the deployment of automated wood chip heating systems and bring in international best practices for biomass heating and biomass
fuel pricing.

Although the renewable energy law in Belarus guarantees an attractive feed-in tariff for biomass-based electricity (18.76 U.S. cents per kilowatt-hour [kWh] as of 2013 for the first 10 years of operation and 11.9 U.S. cents per kWh for years 11–20), there has been limited investment in biomass-based electricity generation. The reason is that the feed-in tariff is directly linked to industrial electricity prices, which are likely to be revised downward after the planned removal of cross-subsidies from electricity to heat and from industrial to residential users. The proposed project would support biomass-fired combined heat and power plants so as to scale up renewable electricity generation in Belarus. On the side of energy efficiency, the project aims to expand the penetration of the building-level substation technology and demonstrate the possibilities for achieving the benefits of energy conservation on a financially sustainable basis.

**Relationship to CAS**
The Project Development Objectives are fully aligned with the Belarus CPS (FY14-FY17) wherein the second pillar is to support the improvement of quality and efficiency of public infrastructure services, use of agriculture and forestry resources, and global benefits of public goods. The proposed project will help enhance the efficiency and affordability of district heating, promote the development of the biomass sector, and reduce greenhouse gas emissions.

### II. Proposed Development Objective(s)

**Key Results (From PCN)**

1. Improved energy efficiency of the district heating systems, measured by:
   - Reduction in annual heat losses (MWh/year) in the project areas;
   - Reduction in temperature-adjusted heat consumption of buildings in the project areas (MWh/year);
   - Projected lifetime energy savings (MWh);
   - Projected lifetime fuel savings (MJ);
   - Projected generation capacity savings (MW);
   - Number of people that gained access to more energy-efficient heating facilities
2. Increased use of biomass in heat generation, measured by:
   - Generation capacity of renewable energy (biomass) constructed under the project (MW);
   - Share of biomass fuel in heat (and power) generation in the project areas (%);
3. Reduced CO2 emissions measured by:
   - Reduction in CO2 emissions due to investments under the project (tons).

### III. Preliminary Description

**Concept Description**
The proposed project is expected to improve the energy efficiency of district heating (by reducing heat and water losses in heat transmission and distribution) and increase the use of locally sourced renewable biomass (replacing natural gas for heat generation) in the selected project towns. The project would be implemented over five years, through an Investment Project Financing operation from IBRD to the government of Belarus in the amount of about US$90 million. The project would be implemented by the Energy Efficiency Department of the State Standards Committee, its project management unit BelInvestEnergoSberezhenije (PMU), and district heating companies in areas...
where sufficient biomass fuel supply is available within an economically viable distance.

A recently completed ESMAP-financed analytical and advisory activity (AAA), “Belarus Biomass-Based District Heating” (P130977), provides solid analytical underpinnings to guide the project design. The study identifies technically and economically feasible options for converting natural-gas-fired heat boilers to biomass-fired heat boilers. Feasibility analysis carried out by the study on four representative district heating systems indicates that the proposed investments in energy efficiency and biomass-fired boilers for heating are economically viable. The study provides guidance on how to determine the optimal size and technology options for biomass-based heating. In addition, the study shows that a combination of base-load biomass and peak-load gas produces the best economic rate of return; peak-load biomass is not recommended because the heat load is too low to justify the higher up-front investment costs of biomass boilers. The study also reviews the current biomass fuel contracting practices in Belarus and recommends a shift from volume-based biomass pricing to energy-content-based pricing. The insights and methodologies developed in the ESMAP study would be used in selecting and analyzing investments proposed by the Energy Efficiency Department. Recommendations on improving biomass fuel pricing practices would be incorporated in the project’s technical assistance component.

The proposed project consists of three components:

(1) District Heating Energy Efficiency. This component would include the following typical investments in the selected district heating systems: (i) modernizing the heat substations by introducing individual building-level heat substations and (ii) replacing district heating pipes that have large heat and water leaks. Substations at the building level enable a reduction in technical and nontechnical losses, while improvements in piping reduce technical losses.

(2) Biomass Heat Generation. This component would support investment in biomass boilers or small combined heat and power plants using biomass as the main fuel to replace existing gas boilers. About 10 district heating systems (towns) in Brest, Gomel, Grodno, Minsk, and Mogilev oblasts are expected to be selected. Several criteria would be used for site selection: (i) consumer demand for heat is densely concentrated (measured in MWh/year/channel length), and the population in the proposed community is stable or growing; (ii) biomass fuel (wood chips and wood waste) is available at a reasonable distance from the heat source; (iii) biomass is supplied by certified forestry enterprises from sustainably managed forests; and (iv) biomass will replace imported fuel (gas or oil) for base-load heat generation.

The types of biomass boilers would be selected to represent well-known technologies with proven operational performance in geographic locations and with biomass feedstocks similar to those of the selected project towns. The concentration of consumer demand (heat load) is a key factor in determining whether the construction of new biomass district heating is economically viable. Economic feasibility analysis would take into account local conditions to ensure that biomass provides the least-cost solution for heat supply in each proposed project area.

(3) Technical Assistance and Capacity Building. This component would finance capacity building for the participating district heating utilities and implementation support to the PMU and the participating utilities. The component would include (i) social accountability measures; (ii) technical assistance to support the shift from the current volume-based biomass pricing to energy-content-based pricing; (iii) gender consultation, including support to develop gender-informed
project design and to undertake gender impact assessments; (iv) implementation support consultancy to support the PMU and the utilities in the implementation and supervision of the project; (v) training and capacity building for the district heating utilities based on international best practices for energy efficiency improvements in district heating and proven biomass technologies; (vi) social surveys of customer satisfaction before and after the project; (vii) an annual financial audit of the project accounts; and (viii) other consultancy services. For small towns, social accountability efforts would focus on improving access to and availability of information for consumers and civil society organizations on district heating services, the structure of bills, benefits of energy efficiency, project design and implementation, and the like. For large towns, the project would support efforts by the Energy Efficiency Department to improve grievance mechanisms and feedback analysis to enhance service delivery.

IV. Safeguard Policies that might apply

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V. Financing (in USD Million)

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