Korosten Urban Territorial Community of Zhytomyr Region

General information about the community.

The community was established as part of the administrative-territorial reform in 2020, encompassing the city of Korosten and surrounding villages. It boasts a well-developed industrial sector, including machinery, woodworking, food, and light industries. Due to its strategic location and well-established transport infrastructure, Korosten serves as a key logistics hub that drives the region's economic growth. The formation of the unified community has opened up new opportunities for attracting investments into the local economy. The Korosten community is focused on fostering a business-friendly environment, supporting small and medium enterprises, and implementing infrastructure projects, including those aimed at climate change adaptation.

Area: 816.6 km². **Population:** 71,500 (as of 2021).

General information about the project.

Project overview and goal. The Korosten Municipal Enterprise "Vodokanal" is the primary utility in Korosten, providing centralized water supply and wastewater services. The designed capacity of the water supply system is 20,000 m^3/day. The facility operates two stations: the first-lift pumping station (water intake from the river) equipped with three pumps of 37 kW each with a capacity of 350-400 m^3/h, and the second-lift station (city distribution) with three pumps of 90 kW each and a capacity of 450 m^3/h. The project proposes the installation of an SPP for self-consumption on the first and second-lift pumps with the option to reroute power to the filter station pumps, and potential future expansion to the water pumping station (WPS). Only critical infrastructure for the water supply system's operation will be prioritized, ensuring the capacity to supply water and maintain system operations in a minimal critical mode, using solar generation in tandem with diesel generators.

The goal is to ensure continuous water supply for residents during power outages at key water utility sites in Korosten through the use of an SPP and energy storage systems, while improving reliability and reducing service costs compared to power from the grid or diesel generators. The project will lower water service costs by replacing part of the purchased electricity and reducing greenhouse gas emissions.

Project location: Zhytomyr Region, Korosten, 67 Hrushevskoho Street.

Investment model. Direct investments (the investor builds the renewable energy system and sells electricity at a price below market value, eventually transferring ownership of the power plant to the community).

Project status. The feasibility study is available, developed in collaboration with the NGO Ecoclub. Preliminary technical and economic assessments have been made for the installation of solar power plants for the water utility (for the first and second-lift pumping stations). An evaluation of investment attractiveness has been conducted, and proposals have been provided for implementing the projects using the energy service mechanism. The proposals are currently under review.

Project parameters and required investments.

Expected project implementation period: 13 months.

Key parameters of the potential project (capacity, area, equipment, etc.): the water pumping station is located in the central part of the city of Korosten. It consists of the first and second-lift pumping stations, a filtration station, and three reservoirs. The designed capacity of the pumping station is 20,000 m^3 of water per day. The land area of the facility is 7.5621 hectares according to the land use extract.

The main energy-consuming equipment of the municipal enterprise includes:

- First Lift Pumping Station: WILO NP 150/315 V-37/4 pump, 37 kW – 3 units.
- Second Lift Pumping Station: WILO NP 150/400 V 90/4 pump, 90 kW – 3 units.
- Filtration Station: NP 150/315 45/4-12 pump, 45 kW – 2 units.
- Filtration Station: 200 D/50 pump, 110 kW – 1 unit.

Backup power equipment:

- Pramac PX 8000 generator, 4.5 kW, fuel type: gasoline, 2.66 l/hour.
- FV 11001 TE generator set – 2 units, 9.5 kW, fuel type: gasoline, 4.9 l/hour.
- CATERPILLAR 150 GC diesel generator, 150 kW, fuel type: diesel, 33 l/hour.

The feasibility study evaluates several scenarios for ensuring uninterrupted water supply system operation using renewable energy sources, as well as under normal conditions of the electrical grid. Both nominal and optimal power scenarios for the water supply and wastewater systems are considered, taking into account that the profile of the water supply networks does not allow the operation of the water supply system with the wastewater treatment stations disconnected.

Payback period:

Scenario 1 – Station capacity: 50 kW, battery capacity: 50 kWh, annual consumption offset: 69,235 kWh, investment: €104,103, annual savings: €12,569 with an electricity cost of UAH 7.1/kWh, simple payback period: 8.3 years.

Scenario 2 – Station capacity: 240 kW, battery capacity: 600 kWh, annual consumption offset: 332,327 kWh, investment: €714,892, annual savings: €60,330 with an electricity cost of UAH 7.1/kWh, simple payback period: 11.8 years.

Scenario 3 – Station capacity: 50 kW, battery capacity: 45 kWh, annual consumption offset: 69,235 kWh, investment: €93,128, annual savings: €12,569 with an electricity cost of UAH 7.1/kWh, simple payback period: 7.4 years.

Scenario 4 – Station capacity: 150 kW, battery capacity: 250 kWh, annual consumption offset: 207,705 kWh, investment: €357,385, annual savings: €37,704 with an electricity cost of UAH 7.1/kWh, simple payback period: 9.5 years.

Project cost:
Scenario 1 – Investment: €91,292.
Scenario 2 – Investment: €626,308.
Scenario 3 – Investment: €81,588.
Scenario 4 – Investment: €313,100.

Co-financing amount/community contribution. The community is ready to provide co-financing of approximately 7-10% of the total project cost. It will provide all necessary information regarding the operation of the municipal enterprise, ensure access to facilities, and involve all relevant staff members from the executive bodies and the municipal enterprise in the working process.

Guarantees the community can provide to potential investors. Assistance in obtaining all necessary permits for the construction of the solar power plant.

Project impact on the community.

Project benefits: the centralized water supply service in the city of Korosten covers 66% of the population, approximately 41,000 people. A key humanitarian aspect of the project is providing drinking water to residents, including over 3,000 internally displaced persons. The service users include nearly all public institutions such as schools (11), kindergartens (19), healthcare facilities (2 hospitals and 2 clinics), social institutions, as well as other local businesses.

Moreover, one of the key beneficiaries of the project will be the municipal enterprise, which will see a reduction in electricity consumption from the grid through the use of solar energy generated by the solar power plant (SPP). This will significantly reduce the company's electricity costs, while also ensuring uninterrupted service, even during power outages or periods of martial law. Local authorities will also benefit, as they will reduce municipal budget expenditures on subsidies to the utility, while simultaneously increasing the reliability and continuous operation of critical infrastructure. Additionally, the local government will gain valuable experience in implementing renewable energy projects within the community.

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