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RES FOR PUBLIC BUILDINGS IN ZHMERYNKA

– Zhmerynka, Ukraine (Vinnitsia oblast)

In a nutshell

The Zhmerynka municipality has implemented an innovative heat pump system in its public buildings to enhance energy efficiency and reduce reliance on conventional energy sources demonstrating its commitments to energy security and a green transition, setting a model for other communities in Ukraine.

Background

In 2009, Zhmerynka committed to the Covenant of Mayors initiative, deciding to reduce its own energy consumption and CO2 emissions in key urban sectors. The city administration was very active in its efforts and in 2015 become a part of with the EU-funded Covenant of Mayors - Demonstration Projects programme. In 2015-2018 four public buildings were thermally refurbished within the project, including a building of kindergarten No3 "Veselka" where heat pumps has been installed.

In 2021 Zhmerynka recommitted to Covenant of Mayors for Climate and Energy and declared new and more ambitious energy and climate targets by 2030.

In 2023, Zmerynka and five more Ukrainian municipalities started cooperation with Japan government and its cooperation agency JICA aimed at recovery and reconstruction as a result of competitive selection of pilot cities for the demonstration project.

Description of the action

01

Pre-feasibility study and project design

02

Installation of the outdoor unit of heat pumps consisting of 5 compressors in the capacity of 16 kW each, evaporator coil and fans.

03

Installation of indoor unit consisting of heat exchanger, controller and expansion valves

04

Coaching pre-school personnel on use of heat pumps, setting up the necessary parameters for heat regulation

EU4Energy

Covenant of Mayors for Climate & Energy Eastern Partnership

Focus on renewables in Ukraine

Ukraine has embarked on an ambitious journey to significantly increase its use of renewable energy sources. Driven by the dual goals of enhancing energy independence and aligning with European environmental standards, the country has set a target to source 25% of its total energy mix from renewables by 2035. This marks a substantial leap from its previous levels, where renewables accounted for around 11% of its power generation in 2020. This shift towards renewables is not only seen as crucial for the country's economic recovery post-war but also as a key step in its broader environmental and climate objectives.

Zhmerynka

Population: ***49 474***	***Area:*** ***530,5 sq. km***
Signatory to the Mayors since: ***2009***	***CO_2 emission reduction target:*** ***34 715 m***

Photo

Controllers of the Heat Pumps in the basement

Photo

Heat pumps at the backyard of the kindergarten

FACTUAL RESULTS OF THE PROJECT ARE FOLLOWING:

Annual energy reduction 64 MWh

Annual reduction CO_2 17,2 tons

Monetary savings – 15,000 EUR annually

Achievement and advice for replication

An air-to-water heat pump is a type of heat pump that transfers heat from the outside air to water, which can then be used for heating systems such as radiators or underfloor heating. However, the most efficient way is to use them both for heating and preparation of hot water. The performance of an air-to-water heat pump can be affected by the outdoor temperature. They are most efficient in the offseason but can still function in colder conditions, though with reduced efficiency. Compared to alternative heating methods, heat pumps are at least twice as efficient as gas boilers and 3-4 times more efficient than electric boilers.

List of advantages:

- Quick installation of equipment (up to 1 month);
- High efficiency of technology, providing 3-5 units of heat for every unit of electricity consumed;
- Relatively low operational costs, only regular maintenance is required;
- Heat pumps can provide both heating and cooling that makes possibility to maintain comfortable temperatures year-round;

However, there are few drawbacks worth noting for decision-makers:

- The upfront cost of purchasing and installing heat pumps can be significant, which may be a barrier for some public institutions;
- The efficiency of heat pumps can decrease in extremely low temperatures;
- Heat pumps rely on electricity, which can be a disadvantage in case of regular power shortages;
- While heat pumps are generally quieter than traditional systems, the outdoor units can still produce noise, which might be an issue in certain settings.

Financing

Financing source(s):
Grant from Japan Government (100%)

Total amount:
n/a

Return on investments:
App. 15.000 EUR per year

Payback period:
2-5 years

Useful links

HTTPS://ZHMERYNKA.CITY/ARTICLES/340144/U-ZHMERINSKOMU-SADOCHKU-3-VESELKA-VSTANOVILI-5-SUCHASNIH-TEPLOVIH-NASOSIV-VID-KOMPANII-PANASONIC

HTTPS://WWW.YOUTUBE.COM/WATCH? V=YDVZI2ABXPS

Key figures

Energy savings – **64** MWh per year,

Monetary savings – **15,000** EUR per year

CO_2 emission reduction – **17.2** tons per year

125.000 beneficiaries of the city

n/a

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Contact

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