

FULL THERMAL INSULATION OF MULTI-APARTMENT BUILDINGS

Spitak, Armenia

IN A NUTSHELL

Within the EU-funded Access to Renewable and Efficient Energy in Municipalities Vayk and Spitak” (AREEM) Project replicable and efficient models of energy-saving are developed and tested in the municipalities of Spitak and Vayk through use of efficient measures and renewable energy sources in residential and public buildings. The project is implemented by Habitat for Humanity Armenia Foundation.

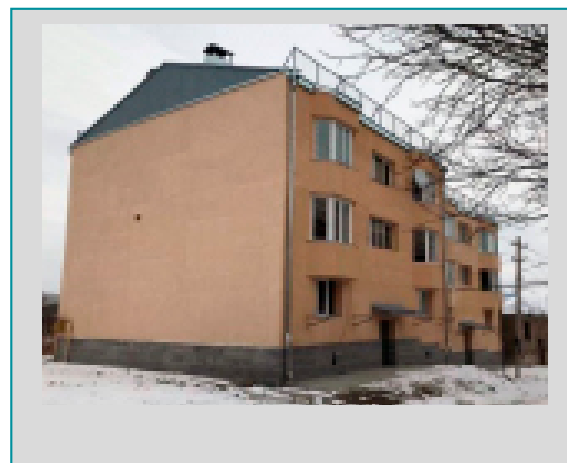
Background

Armenia is surrounded by countries with significant carbon energy resources but the country itself is not rich in fossil fuel energy resources. Alongside with the improvement of living standards, energy prices tend to increase. While addressing energy efficiency in residential buildings, the AREEM project also intends to facilitate access to renewable (solar) energy in the public sector and increase the share of renewable energy sources in the total energy balance of the municipalities. The project will help to promote energy renovations, limit energy waste, reduce air pollution and cope with climate change. The AREEM project's key activities are energy-saving measures in apartment buildings, such as upgrades and insulation of roofs, doors and windows and/or building enveloping in 45 residential buildings (33 in Spitak and 12 in Vayk). Moreover, 5 residential buildings have been comprehensively refurbished.

Description of the action

Within the framework of the AREEM project, five multi-apartment buildings constructed in 90s and located in K5 district of Spitak town (Armenia) have been refurbished, through the following measures: full envelopment insulation, insulation of roof/attic floor and basement, replacement of doors in common spaces, replacement of windows in common spaces and apartments, repair of roofs, repair of drainage system.

The particular activities implemented by the project are as follows: thermal insulation of external walls of the buildings with 15 cm of mineral wool, thermal insulation of external walls/plinth with 10 cm of XPS (extruded polystyrene foam), replacement of 43 windows (U-value of less than 1,3 W/m²K), replacement of 30 doors (U-value of less than 1,8 W/m²K), thermal insulation of basement ceiling with 10 cm of mineral wool, and refurbishment and thermal insulation of the roof with 15 cm of mineral wool, including repair of drainage system.



A multi-apartment building in Spitak after the full thermal refurbishment

SPITAK



Population:

15,000

Area

60,6 km²

Signatory to the Covenant of Mayors since:

2014

CO₂ emission reduction target:

2,294

The project started in October 2017 with assessments of the baseline situation and audit, and was completed in January 2019. Implemented activities helped to reduce the energy consumption costs of about 80-100 tenants of the target buildings as well as to improve the thermal comfort of indoor environment resulting in 100% occupancy rate after refurbishment.

Focus on the house of culture

Along with the full thermal insulation of 5 MABs, energy efficiency measures and construction works in 28 MABs in Kenton district have been accomplished by the municipality of Spitak with the support of the EU. Within the scope of this project component, all roofs of the target buildings have been refurbished and thermally insulated, 37 windows have been replaced by energy saving windows (U-value of less than 1,8W/m²K), 81 new doors (36 insulated metal and 45 PVC) have been installed. In addition to the mentioned measures, 63 insulated metal doors were installed in 32 additional apartment buildings. As a result, annual energy saving (electricity and heat) of about 820 MWh/a, and carbon greenhouse gases emission reduction of 184 tCO₂/a have been achieved.

Achievement and advice for replication

The full thermal refurbishment of five multi-apartment buildings in Spitak resulted in about 65% of energy saving. Along with energy saving, the project helped to achieved better thermal comfort in the apartments and increase the overall occupancy rate of the MABs up to 100%. Moreover, the visual appearance of the buildings has been improved and their market value has been increased. Estimated annual energy saving of 355 MWh/a is equal to an annual monetary saving of about 25.000 Euro/a, if expressed in electrical energy only.

The project activity has a huge potential for replication and may result in substantial energy saving in residential sector that is responsible for about 40% of the total energy consumption in the country. However, this potential can be materialized only with the considerable financial support by the national government and the donor community. Since 2018, the Government of Armenia has been supporting the Armenian municipalities with implementation of infrastructure projects (including construction and refurbishment of municipal and residential buildings) by provision of 40-60% co-financing through the state subvention program..



KEY FIGURES

- 5** residential buildings
- 6** apartments in each MAB
- 43** windows replaced
- 30** doors replaced
- 10-15 cm** of mineral wool applied
- 10 cm** of XPS applied
- 65%** energy efficiency
- 335 MWh** annual energy saving
- 75 tCO₂** annual GHG emission reduction



FINANCING THE PROJECT

+ **Financing source(s):**
European Union & Spitak municipality

+ **Total amount:**
USD 400,000

Note : Project costs include the cost of technical design, equipment and installation.

+ **Payback period:**
16.5 years

Note: PP is calculated based on average end-user tariff for electricity (41.6 AMD/kWh)

USEFUL LINKS

- ▶ [CoM-Dep](#)
- ▶ [Habitat for humanity Armenia](#)



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