

Pilot Project 1. Implementation of energy efficiency measures at Gldani VIII micro district, block # 26

PROJECT HIGHLIGHTS

This project included implementation of energy efficiency measures in the common spaces and one apartment (#24) of the multi-apartment building at Gldani VIII micro district, block #26 address in Tbilisi.

The project was funded by the USAID “Addressing Affordability of Utility Services in Urban Housing in Georgia: Energy Efficiency Solutions” Program.

Prior to project implementation, the air temperature in the entrances of the building as well as the internal air temperature in the apartments was very low (-4 °C, when the outdoor temperature was -6 °C). Cold air was constantly blowing through the entrance, thus increasing the heating costs for the residents.

Key Results

- **Cost Savings** – during a single 4-month heating season the monetary savings from implementation of EE measures in the entrance of the building comprise approximately \$520 for the entire entrance with its households. From implementation of EE measures in the apartment the cost savings during the heating period will add up to \$37.3.
- **Increased comfort** – approximate 3÷4 °C temperature increase in the apartments due to the installation of entrance doors and basement windows.

PROJECT APPROACH

The Energy Efficiency Center (EEC) of Georgia has determined this multi-apartment building at Gldani VIII micro district, block #26 address in Tbilisi, for implementation of the energy efficiency measures in the common space – building entrance as well as in one of the apartments of the same building. The main criteria for selecting this building were the typical construction design of the building for the multi-apartment building stock as well as the willingness of the households to participate in the project.

The EE measures included:

- Replacement of wooden single glazed window with the modern metal-plastic window and also replacement of the incandescent light bulbs with compact fluorescent bulbs in the apartment 24,
- Repairing the wooden window frames and glazing in the building entrance,
- Repairing and thermal insulation of the entrance door and installation of a spring system for keeping the door shut,
- Painting of the entrance door and windows.

The budget for this project comprised \$1,279, of which:

- Entrance doors and windows - \$409,
- Apartment 24 - \$870, of which \$830 was spent on replacement of the windows, and \$40 on the CFLs.

RESULTS

The EEC conducted a follow-up monitoring of results of implementation of the aforementioned EE measures. According to the monitoring results the internal air temperature in the building entrance as well as in the apartments has increased by around 3÷4°C.

Besides the temperature increase, there was also a decreased electricity and natural gas consumption reported by the residents, compared with the pre-project months. In order to make the monitoring analysis more fundamental, the EEC also acquired the electricity and natural gas consumption data from the utilities for the households participated in the project for the previous heating season of 2006-2007. According to the analysis of the electricity and natural gas consumption for two heating seasons of 2006-2007 and 2007-2008 there was an aggregate 3% electricity consumption decrease and 12% natural gas consumption decrease in the entrance households. The electricity consumption decrease is not necessarily a result of the implemented EE measures, since it is not used for heating purposes, but the natural gas consumption decrease can be attributed to the positive effect of the project.

The average aggregate monetized energy savings for the building entrance during the heating season were the following:

- \$114.2 USD/month for natural gas,
- \$16.2 USD/month for electricity.

Thus the average payback for this measure will be around 3 months, which is less than the heating season.

The outcomes of the EE measures implemented in the apartment 24 are more drastic. According to the monitoring results when comparing the pre- and post-project energy consumption in the aforementioned apartment there was 40% (116 m³) less natural gas consumed for heating purposes and around 20% (32 kWh) less electricity consumed on a monthly basis.

Replacement of 6 incandescent lamps with 100W capacity with 25W CFLs, keeping the lighting quality equal to the previous option, saves 75% electric energy on lighting, which adds up to around 820 kWh/annum (around \$85). When compared this saving with the investment size for this EE measure (\$40), it is evident that the payback for this investment is two years.

Since the heating of the apartment was done with natural gas, then during the monitoring of the results, only the natural gas savings were considered as the main indicator. Thus, the average monetized energy savings in the apartment 24 during the heating season were the following:

- \$37.3 USD/month for natural gas.

The payback for this EE measures will be around 5.5 years.

LESSONS LEARNED

Implementation of small-scale energy efficiency measures can lead to significant energy and costs savings combined with relatively short payback for some EE measures.