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**MUNICIPAL HEATING
REFORM IN UKRAINE**



DTEK

Energy Efficiency: Strategic Development of the Capital



In 2011, the Kyiv City State Administration (KCSA) started intensive preparation for systemic modernization of the municipal infrastructure, step by step implementation of which is reflected in the document "Strategy of Kyiv Development through 2025". For the first time in history, an "Economical Energy Sector" initiative was incorporated in this main document of the city. Presenting this document to the public, KCSA Chairman Oleksandr Popov said: "Reduction of energy consumption is a priority task of the Kyiv Development Strategy through 2025, as cutting costs of communal utilities will lead to significant budgetary savings. In addition, a new 15-year energy strategy for energy reconstruction of Kyiv is aimed at building an economical and green modern energy sector and warm housing for living in the 21st century."

To implement the Strategy and the EU Covenant of Mayors which Kyiv joined in November 2011, a team of international and national experts in cooperation with the engineering and energy companies of the city, with support of the U.S. Agency for International Development (USAID) completed development of the Municipal Energy Plan (MEP) of Kyiv through 2016. This plan of comprehensive modernization of the Kyiv district heating system designed for 5 years became the first phase of Strategy fulfillment. According to the plan, in order to save budget funds, Kyiv initiates the largest project in CIS of comprehensive thermal modernization of 600 schools and kindergartens, which will also reduce the need of heat energy in public buildings by more than 60%. The first pilot energy efficiency projects are kindergarten #573 and secondary school #233 in the Obolon district of Kyiv.

Partners of KCSA in MEP development and implementation of energy efficiency projects were the USAID Municipal Heating Reform Project and energy company DTEK, which signed a trilateral Agreement on Cooperation in July 2011.

Pilot Projects of Comprehensive Energy Efficient Improvements of Buildings

Implementation of energy efficiency projects in kindergarten #573 and secondary school #233 is the result of fruitful cooperation between the USAID Municipal Heating Reform Project, KCSA and energy company DTEK. According to the terms of agreement on trilateral cooperation, USAID Project has provided financial assistance worth UAH 2 million, and energy company DTEK – UAH 3 million. Also, UAH 9 million for fulfillment of thermal modernization works at the demonstration sites was allocated from the Kyiv municipal budget.

These demonstration sites were selected for implementation of energy efficient measures because energy consumption in both buildings exceeded the EU norms by many times. The results of energy audit in kindergarten #573 showed that the building used to consume 415 kW•h/m² a year which exceeds the EU norm (65 kW•h/m²) by 6 times. In 2018 the EU norm will be reduced to 15 kW•h/m² a year.

As a result of trilateral cooperation, the building of kindergarten #573 became the first building in Kyiv in which all possible pay-back-through-savings energy saving measures were implemented. *Project Implementation Unit for the Kyiv Public Building Energy Efficiency Project* and Obolon District State Administration of Kyiv implemented the energy saving measures on behalf of KCSA.

At these objects:

➔ To reduce energy consumption for heating, heat insulation was installed on the building envelope, basement and roof, energy efficient windows and doors were installed, internal heating system and radiators were replaced, operation of the ventilation system was reinstated and an exhaust-air heat exchanger was installed, the heat distribution system was adjusted, and an individual heat sub-station was installed.

➔ To reduce energy consumption for hot water preparation, the wading pool heating system was modernized, solar collectors were installed for water heating, sanitary-ware items were replaced and water-tap aerators were installed.

➔ To reduce electricity consumption, the lighting system was renovated with installation of energy saving lamps, and the ventilators and electric stoves were replaced with energy efficient units.

Implementation of these measures will reduce total energy consumption by more than 60%. In addition, modernization of kindergarten #573 and secondary school #233 will allow annual savings of up to UAH 950,000 from the municipal budget.



Kindergarten #573 Before Thermal Modernization



Kindergarten #573 After Thermal Modernization



Secondary School #233 Before Thermal Modernization



Secondary School #233 After Thermal Modernization

Energy Efficient Measures Implemented in Kindergarten # 573



Heat Sub-Station



Roof Insulation, Installation of Solar Collector for Hot Water Supply



Insulation of Outer Walls



Reconstruction of Ventilation System



Reconstruction of Heating System



Replacement of Distribution Pipelines



Installation of Energy Efficient Windows

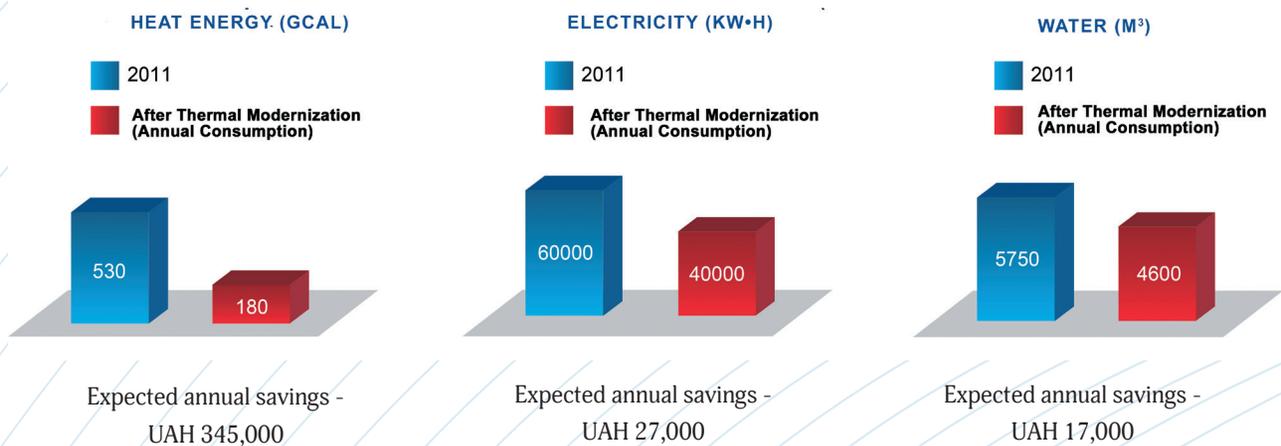


Installation of Energy Efficient Kitchen Stoves



Reconstruction of Lighting System

Consumption of Energy Resources Before and After Reconstruction*

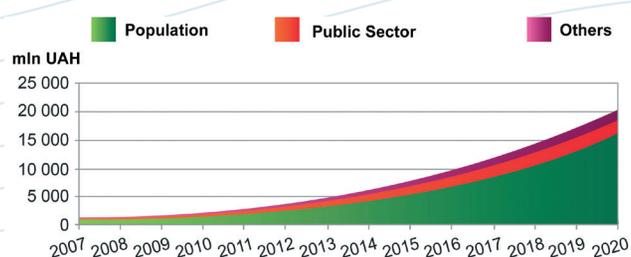


* According to data of Project Implementation Unit for the Kyiv Public Building Energy Efficiency Project

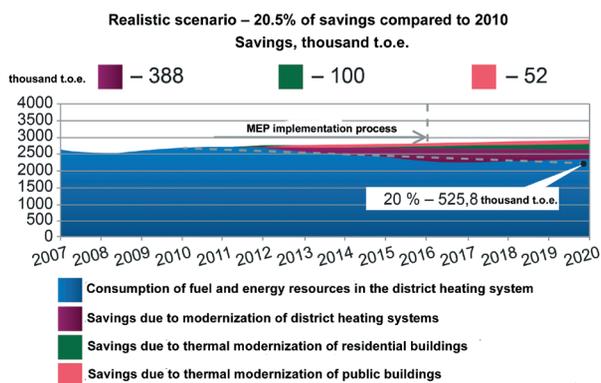
Strategy for Improvement of Energy Efficiency

Sustainable energy development has become part of basic energy policy for most developed countries. The European initiative to reduce energy consumption, replace fossil fuels with renewable energy sources, and reduce discharge of greenhouse gases into the atmosphere by 2020 was initiated by the voluntary initiative of local authorities in accordance with the Covenant of Mayors pact. As of the beginning of 2012, the Covenant of Mayors pact had been signed by the mayors of 3,775 European cities, including Kyiv, which joined the initiative in November 2011.

Forecast for Increase of Heat Energy Bills



Reduction of Consumption in 2020 Compared to 2010



The necessity of implementation of energy efficient projects in the capital is caused by the fact that in the last five years energy bills have increased by five times and in 2012 reached UAH 1 billion. Understanding that this is a huge burden on the budget, the city administration was looking for ways and partners to help in development and implementation of energy efficient improvements in the capital.

These partners for the Kyiv City State Administration became the USAID Municipal Heating Reform Project and energy company DTEK, which in July 2011 signed a trilateral Agreement on Cooperation. The first step towards energy efficiency in the framework of this cooperation was development of the Municipal Energy Plan (MEP) of the capital, which provides for significant improvement of heating system energy efficiency by 2016.

The MEP provides for a comprehensive thermal modernization of 600 schools and kindergartens that will reduce the need in heat energy for the public sector by more than 60%. Already in 2013, due to cooperation with the USAID Project, it is planned to implement a UAH 100 million project that consists of a soft NEFCO loan, grant from E5P fund, municipal budget funds, Kyiv ESCO funds and other sources.

As part of this task, it is planned to replace more than 1000 km of pipes of hazardous and worn sections of the heating networks, with pre-insulated pipe technology, to install more than 4,000 individual heat sub-stations, and to reconstruct the existing production facilities. Implementation of these plans will reduce the need for heat by 20%, reduce heat losses in the heat distribution system, and reduce electricity consumption during transportation.

In addition, implementation of measures from the Kyiv Municipal Energy Plan will improve the energy and environmental security of the city, increase the share of renewable sources in the balance of heat generation and help in reducing budget expenditures to pay for communal services by reducing consumption of energy resources in public buildings.

USAID Municipal Heating Reform Project in Ukraine

(044) 5965960
info@mhrp.org.ua

LLC DTEK
Social Development Department

(044)5814542
csr@dtek.com

Implementer from KCSA:
Project Implementation Unit for the Kyiv Public Building Energy Efficiency Project

(044) 2345410
kiba@piu.kiev.ua