

Energy
Efficient Schools
and Campuses

2009



USAID
FROM THE AMERICAN PEOPLE

MUNICIPAL HEATING
REFORM IN UKRAINE

2010



Investments
in Energy
Efficiency

Energy
Conservation
Campaign



Energy
Management
and Monitoring

2011

2012

2013





Dear partners,

I am truly happy to have this opportunity to thank you for the fruitful cooperation and achievements that we managed to make together with you in four years of the USAID Municipal Heating Reform (MHR) Project in Ukraine that was implemented by International Resources Group.

During this period, the USAID MHR Project cooperated with the Government of Ukraine and local authorities to implement positive systemic changes in the heat supply sector on three relevant levels: national, regional and consumer level. It helped to create the foundation for a financially viable and sustainable district heating sector that will ensure providing of quality services to the public, state agencies and local industries.

Since its inception, the USAID MHR Project has provided support to the Government of Ukraine in improvement of the legal framework for implementation of necessary reforms in the heating sector. Experts of the USAID MHR Project participated in working

groups of the Government and Parliament to draft laws and regulations, as well as new normative and legal documents, and to ensure their compliance with EU legislation. This legislative work became the basis for positive transformations in the Ukrainian cities which received an opportunity to develop new practices and methodologies in the field of energy efficiency to increase their capacity and attractiveness for new investments.

With assistance of the Project experts, the Law of Ukraine “On Establishment of the National Communal Services Regulatory Commission” was drafted and adopted. This regulator has real opportunities to institutionalize the best international practices for transparent and predictable regulation of the municipal heating sector in Ukraine. Primarily, I am referring to full cost recovery tariffs, which provide for planning of sufficient investments in the sector, and ensuring appropriate quality of customer service.

To strengthen the capacity of local governments to plan, manage and finance development of heating systems, the USAID MHR Project selected 25 partner cities for implementation of pilot projects. The cities were selected as a result of a detailed review of applications from nearly 100 Ukrainian municipalities that expressed their interest in Project activities and participated in the competition that was held immediately after the launch of the Project in 2009.

Cooperation with partner cities covered a wide range of activities, including: analysis of the condition of district heating systems, development of municipal energy plans, development of the legal framework and the technical specifications of meters, implementation of energy efficient technologies, as well as introduction of monitoring of the Projects’ results. In addition, the USAID MHR Project contributed to creation of condominiums, condominium associations and housing cooperatives, and assisted in improving

management and increasing financial credibility of home owners.

In its work with the partner cities, the USAID MHR Project assisted in seeking financing and involvement of the private sector for implementation of public-private partnerships and implementation of energy efficiency projects in the communal sector.

At the same time, the USAID MHR Project launched a multi-component national information campaign that included public educational activities on energy efficiency. The campaign raised the issue of Ukraine’s dependence on energy imports, explained the methods of efficient use of heat in apartment buildings, and the benefits of creating condominiums and installing heat metering systems in apartment buildings. The campaign placed special emphasis on educating young people and implementing programs of low-cost energy saving methods. Information activities of the USAID MHR Project were held to clarify to the public and the executive bodies of local governments the benefits of proposed legislative changes, tariff reforms and measures implemented to ensure social guarantees.

I congratulate and thank each of you personally, all organizations, schools, municipalities, ministries and agencies that committed to cooperate with us in order to provide a huge and long-term success of our joint efforts within the framework of the USAID Municipal Heating Reform Project in Ukraine.

Sincerely yours,
Bil Tucker
Chief of Party
USAID Municipal Heating
Reform Project in Ukraine

SUPPORT PROVIDED TO UKRAINE BY USAID MHR PROJECT ON THE NATIONAL LEVEL

During the four years of its activities in Ukraine, the USAID MHR Project worked closely with the Ministry of Regional Development, Construction and Housing and Communal Services (Min-Region), National Communal Services Regulatory Commission, Ministry of Social Policy, Cabinet of Ministers and the relevant committees of the Parliament, as well as other authorities to improve the legal framework for implementation of necessary reforms in the heating sector. Experts of the USAID MHR Project participated in the working groups of the Government and Parliament to amend laws and regulations, as well as to develop new normative and legal documents.

The project cooperated with the Center for Economic Reforms at the President of Ukraine, international financial institutions such as the World Bank, NEFCO and EBRD, and the Government to prepare and implement urgent reforms in the field of energy efficiency. As a result of this cooperation the National Action Plan for Energy Efficiency in the Heating Sector was prepared, and was approved by a Resolution of the Cabinet of Ministers.

The USAID MHR Project experts provided assistance in development of the key laws and draft laws to reform the heating sector, such as:



Meeting of MinRegion Task Force on heating sector reforms

- Law on Peculiarities of Lease and Concession in the Housing and Communal Services Sector;
- Draft Law on Condominiums;
- Draft Law on Energy Saving in Buildings;
- Draft Law on ESCO/EPC;
- Draft Law on Metering of Energy Carriers in the Housing and Communal Services Sector; and
- Draft Law on Improvement of Social Protection System.

Since its inception, the USAID MHR Project has provided technical support to the Government of Ukraine in establishment of the National Communal Services Regulatory Commission (National Commission). With the Project's assistance, the Law of Ukraine "On Establishment of the National Communal Services Regulatory Commission" was drafted and adopted. The Project has provided assistance to the National Commission in development of tariff methodologies and conducted trainings for the staff of the regulator and specialists of the heating utilities. To ensure the effective operation of the regulator, the Project passed to the National Commission international methodologies on procedures of its activities and on regulatory accounting, creation of information systems for data transfer, as well as mechanisms for public hearings.

In cooperation with Commissioners of the regulator, the USAID MHR Project helped to develop the law "On Incentive Regulation on the Basis of RAB Methodology."

As a result of cooperation, a new Tariff Setting Methodology, which includes incentives for energy efficiency, was developed and approved. With the help of the USAID MHR Project, the National Commission has developed a Plan for gradual increase of tariffs to cost-recovery levels.

In addition, the Benchmarking Methodology proposed by the USAID MHR Project was used by the National Commission for collection and comparison of data on performance of the district heating utilities.

With Project assistance, the National Commission and the Ministry of Social Policy have prepared a plan to improve social protection of low-income consumers of communal services.

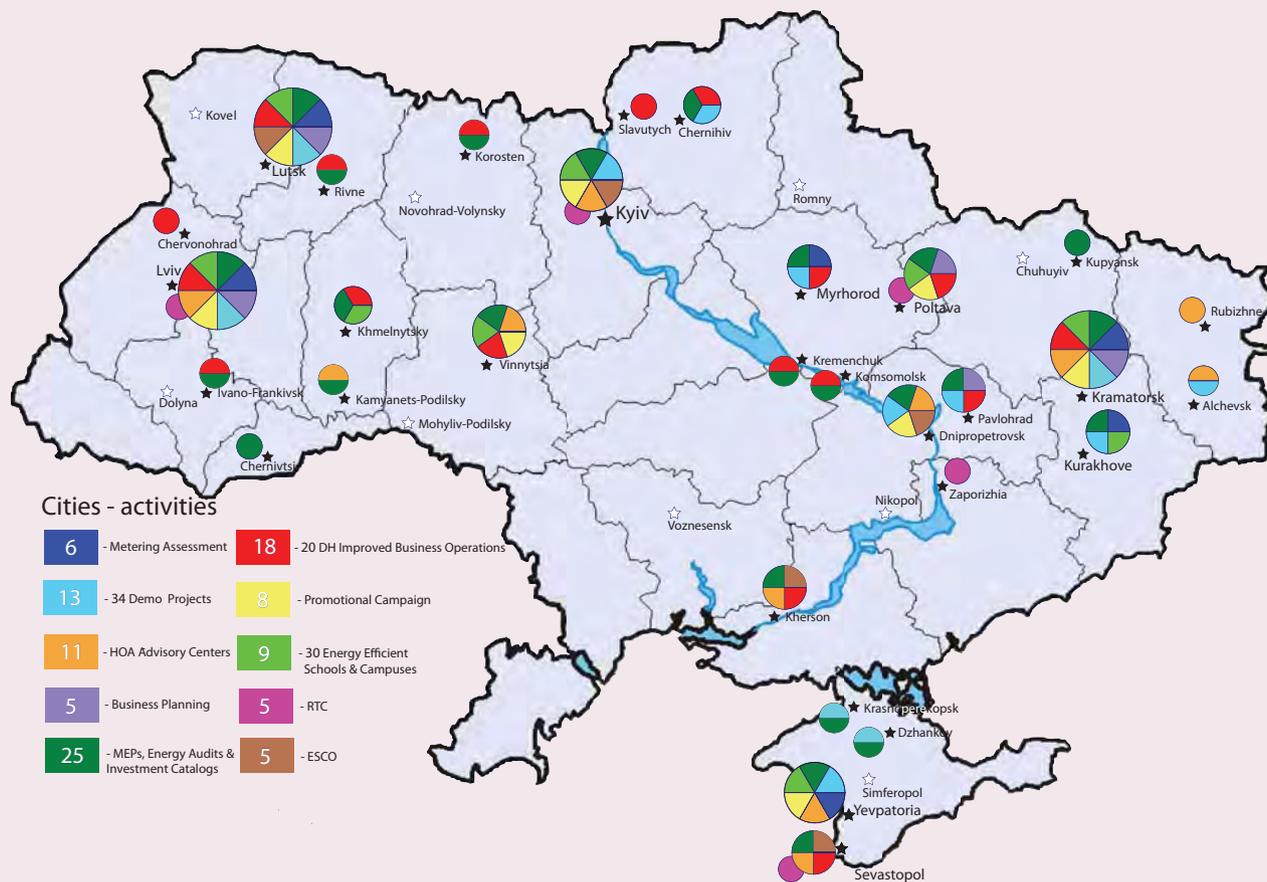


Participation in round table on energy efficiency



Meeting with management of the National Communal Services Regulatory Commission

MUNICIPAL ENERGY PLANNING



Activity map of USAID Project partner cities

Development of the municipal energy plans (MEP) is a mandatory practice in all European countries because the purpose of MEP is to ensure sustainable municipal energy development with reduction of overall energy consumption. MEP is a comprehensive program that addresses the issue of municipal energy supply and energy consumption and is adopted by City Councils for a mid-term period (5 years). The document is based on the previously con-

ducted energy audits of the heating system and typical buildings of the city. Additionally, MEP includes analysis of the municipal budget, macroeconomic indicators, description of problems to be solved for the document's planning period, a feasibility study for implementation of the necessary projects, as well as financial mechanisms for its implementation.

Lack of proper quality energy supply services at affordable prices for the con-

sumers is one of the most acute problems of Ukrainian cities. Nevertheless, none of the cities had strategic documents for management of the energy sector. This is why in 2010 the USAID MHR Project suggested to local authorities a solution to the issue of energy sector development with the help of integrated resource planning methodology authored by a contractor of the USAID MHR Project – the Bulgarian energy efficiency center EnEffect. During the

three years of cooperation with the cities, the USAID MHR Project has trained more than 200 specialists from the partner cities to develop and implement Municipal Energy Plans. In addition, the Bulgarian specialists have trained the trainers of five Regional Training Centers were created to resolve the problem of lack of staffing potential for MEP development, energy audit of buildings and energy management in Ukraine.

Thus, through dissemination of the practice of MEP development, a comprehensive approach to improved efficiency of the heating sector, with incorporation of benefits from implementation of energy efficient measures for both energy consumer and supplier, was applied in Ukraine for the first time.

MEP development, with incorporation of mid-term perspective, resulted in raising the interest of international banks and private companies in investing funds in energy efficiency projects. The saved funds of municipal budgets were allocated for further implementation of municipal energy efficiency projects.

As of today, 25 partner cities of the USAID MHR Project have developed Municipal Energy Plans (MEP) with assistance of the experts from Bulgarian energy efficiency center EnEffect and five Regional Training Centers that were established in Ukraine with the Project's assistance. This helped many of them to take a course towards energy efficiency and to join the European "Covenant of Mayors" initiative. According to the initiative, the cities plan to reduce energy consumption by 2020 by 20%, reduce greenhouse gases discharge by 20%, and to increase use of alternative energy sources by 20%. For these cities, MEP has become the basis for attraction of investments in energy efficiency.

Lviv

Lviv is one of those cities that can serve as an example for other municipalities in terms of approaches and implementation of successful energy efficiency and sustainable energy development projects. Lviv is also a pilot city of the USAID MHR Project and was one of the first to develop and approve the Municipal Energy Plan and to sign the "Covenant of Mayors" initiative.

Lviv MEP was developed in 2011 for the next four years. This document became the basis for approval of the Strategic Energy Efficiency Action Plan (SEAP). This document focuses mainly on communal services sector buildings. The 24 most energy-consuming buildings were selected for implementation of energy efficiency measures and installation of heat controlling equipment. Among the selected buildings there are kindergartens, schools and hospitals that consume 18 percent of the total municipal energy consumption. Thus, due to MEP, the city has identified how to reduce energy consumption and carbon emissions through implementation of energy efficient technologies to achieve the goals of the "Covenant of Mayors." But to implement the planned energy

efficiency projects in the selected buildings, the city had to find UAH 30 million.

The city council received these funds through various international programs based on the information and process of developing the MEP. Indeed, one of the important sections of this document is an investment program that allows the city to attract financial resources for energy efficiency projects. On the other hand, the loans and grants from international organizations are provided to the cities only on the condition of existence and implementation of the Municipal Energy Plan, which is the key for transformation of the city into an energy efficient city.

Thus, thanks to the Municipal Energy Plan created as part of collaboration with the USAID MHR Project, the city of Lviv not only managed to identify the largest heat losses and sources of financing for implementation of energy efficiency activities, but also obtained a loan from the European Bank for Reconstruction and Development of € 20 million and more than € 10 million in grant money from E5P. Also, Lviv received a loan from NEFCO (Nordic Environment Finance Corporation) for implementation of energy efficiency projects in the public buildings.



Condominium in Lviv before reconstruction



Condominium in Lviv after reconstruction

Kramatorsk

Kramatorsk joined the Covenant of Mayors in October 2012. Until that time, the city management had an active position on reforming of the heating system and introduction of energy efficient measures to reduce heat losses in the networks and reduce heat consumption through modernization of buildings.

Modernization was started on the initiative of LLC Kramatorskteploenergo, which supplies heat and hot water to more than 60% of city residents and 70% of state budget organizations. The company was co-founded in 2007 by Contour Global (60%), a private U.S. investment company, and Kramatorsk City Council (40%) on the basis of the Kramatorsk CHP.

In the period of 2007 to 2009, Contour Global invested about \$20 million to upgrade the core and auxiliary equipment of the Kramatorsk CHP, which has made it possible to switch to coal as the main fuel, while observing all environmental standards.

Attracting an investment company in the energy generation sector was one of the first steps of the Kramatorsk city government on the road of transforming the city into an energy efficient one.

The next step involved the city's participation in the USAID MHR Project according to the Memorandum of Cooperation signed between the Kramatorsk City Council, the USAID MHR Project, and Contour Global in 2009.

Experts of the USAID MHR Project, with the help of the representatives of the City Council and heat supply companies, conducted an energy audit of the heat supply system and typical buildings in the city. The partners reviewed the financial mechanisms of implementing the energy efficiency policy underlying the Municipal Energy Plan (MEP) approved by the municipal government in 2010. A number of demonstration projects were also implemented.



Signing of PPP agreement with Kramatorsk and ContourGlobal company

One of the important tasks in implementation of the MEP was reconstruction of the 3rd and 4th heat supply zones of LLC Kramatorskteploenergo company with replacement of the 3rd heat supply zone main with a pre-insulated one intended for operation at an enhanced temperature schedule; installation of plate heat exchangers, energy efficient pumps and automatic control systems; and adjusting the network's thermal and hydraulic operating regimes.

Implementation of this reconstruction helped in reducing the number of pipeline breaches and equipment down-time for repairs. This improved reliability of the heating system. Changing to an independent heat supply system arrangement made it possible to localize intra-quarter breaches, as well as reduce the amount of charge water at the CHP, thus reducing expenses for electricity for pumps.

Financing of these measures amounted to UAH 4.0 million and was conducted with support of Contour Global and the USAID MHR Project. The main result of cooperation was applying a comprehensive approach to introduction of changes and upgrades aimed at saving energy resources and ensuring reliability of the heating system. For instance, the actually achieved reduction in electricity consumption in the 2012-2013 heating season was UAH 600,000 kWt/h, which amounts to more than 1,500,000 kWt/h, or over 1 million a year.

In addition, the Municipal Energy Plan developed with the help of the USAID MHR Project specialists became the foundation for preparation of a business plan and attraction of NEFCO loans for implementation of energy efficiency projects in public buildings.

Kyiv

The need to implement energy efficiency projects in the capital as amplified by the fact that over the past five years payments for energy use have increased by five times, and reached UAH 1 billion in 2012. Realizing that this is a great burden on the budget, the city administration was looking for ways and partners who could help to develop and implement energy efficiency measures in the capital.

These partners for the Kyiv City State Administration were the USAID MHR Project and energy company DTEK, which in July 2011 signed a trilateral Agreement on Cooperation. Having decided to keep oncourse for energy efficiency, Kyiv also joined the “Covenant of Mayors” initiative in November 2011, and undertook the corresponding obligations.

The first step towards energy efficiency within the framework of cooperation with the USAID MHR Project and DTEK company was development of the Municipal Energy



Completion of MEP development in Kyiv in cooperation with DTEK company



Press-conference at the opening of the first Energy efficient kindergarten # 573 in Kyiv

Plan (MEP) for the capital, which provides for a significant increase in energy efficiency of the district heating system until 2016.

As part of this task, it is planned to replace 539 km (in two-pipe calculation) of emergency repaired and worn sections of the heat networks, with pre-insulated pipe, installation of more than 4,000 individual heat sub-stations and reconstruction of the existing production facilities. Implementation of these tasks will reduce the need in heat energy by 20%, reduce wasteful loss of heat energy during heat carrier distribution, and reduce electricity consumption required for pumping during transportation.

The MEP provides for comprehensive thermal modernization of 600 schools and kindergartens, which will reduce the need of heat energy in public buildings by more than 60%. In 2013, in cooperation with the USAID MHR Project, it is planned to implement the project using the mechanism of ESCO Energy Performance Contracting (EPC) worth USD 100 million, which consists of a soft NEFCO loan, E5R fund grant, budget funds, municipal funds and other sources.

Energy Performance Contract (EPC) – is an agreement or set of agreements between the ESCO and the customer aimed at reduction of operating costs and environmental impact of buildings through installation of new energy efficient equipment. The cost of investments is repaid from the savings of energy or energy resources. This mechanism is completely new for Ukraine, although it has been widely used around the world for more than 40 years.

In addition, implementation of Kyiv Municipal Energy Plan measures will improve the energy and environmental safety of the city, increase the share of renewable sources in the balance of heat energy

generation and will reduce budget expenditures on payment for consumed energy resources due to reduction of energy consumption by public sector institutions and organizations.



Energy efficient kindergarten # 573 in Kyiv



School # 233 in Kyiv after thermal modernization

TRAINING OF ENERGY AUDITORS AND INTRODUCTION OF ENERGY MANAGEMENT SYSTEM IN PARTNER CITIES



Municipal energy planning training for partner cities

Conducting energy audits of buildings is a European practice tested by experience that allows estimation of energy use and potential energy savings. In addition, this method is an important stage in Municipal Energy Planning (MEP). The method of energy auditing has been used for decades in international practice and it is extremely important for Ukraine, given Ukraine's energy and economic dependence on energy imports.

In order to provide the Ukrainian specialists with methodology and software products based on Ukrainian and European standards and to ensure the possibility of quickly conducting energy audits of buildings, as part of its cooperation with the cities, the USAID MHR Project has trained professionals from 24 engineering and energy servicing companies from 17 cities of Ukraine. A complex of energy auditing training activities was carried out by the USAID MHR Project partner, the Norwegian company ENSI.

During the MEP training course, which consisted of three phases and lasted 6 months, the Ukrainian experts studied the methodology of building scanning, learned to conduct energy audits and financial calculations, and to implement energy efficiency measures. In addition, 7 training energy audits were conducted in 4 partner cities of the USAID MHR Project. After the third training session, the participants of the course passed the exam and received certificates for the use of licensed software for energy audits of the buildings. The software product will help the Ukrainian experts to significantly improve the efficiency of their work.

Within the framework of the USAID MHR Project, the trained specialists have conducted over 400 energy audits of buildings and heating systems.

The USAID MHR Project provided support in creating an energy management system for all partner cities in Ukraine. In addition, the importance of energy management in the cities is remarkable given the fact that they are the main consumers of heat energy. Thus, introduction of the energy management structure will allow controlling consumption, implementing energy efficiency programs and reducing the cost of energy in general. That is, it will greatly help to solve the issue of rational use of energy in buildings.

In order to provide proper human resources in Ukraine in the system of energy management, the USAID MHR Project assisted in the establishment of advisory committees in all partner cities and creation of the relevant energy management departments in the city administrations.

CONDOMINIUM AS A FIRST STEP TO ENERGY EFFICIENCY IN RESIDENTIAL SECTOR

Resource Centers for Development and Support of Condominiums



Opening of the Condominium Resource Center in Lviv

Only the housing owner will care effectively for maintenance and preservation of the housing stock, creation of comfortable living conditions, and implementation of energy efficient improvements. A condominium is a legal mechanism of decision-making in joint-ownership apartment buildings. The national program of reforms and development in the housing and communal services sector envisages that 45,530 condominiums will be operating in Ukraine by the year 2015, i.e. nearly 50% of all residential buildings. However, establishment of condominiums is yet

to become a mass-scale phenomenon, and there is a trend towards slowing-down in the pace of establishment of these associations in some cities. This situation is exacerbated by a rather small number of “success stories” for the existing condominiums.

To help the cities set up and develop the condominiums, the USAID MHR Project, working with local governments and non-governmental organizations, has built a network of Condominium Resource Centers. The centers provide information and methodological assistance, including assistance on legal matters,

to the co-owners of apartment buildings in the process of condominium establishment, their current operations, as well as in implementing energy efficient improvements in co-owners’ buildings. The centers are established as separate structural units of the City Executive Committees or as non-governmental organizations. In both cases, achievement of positive results in operation of such centers is possible thanks to an ongoing interaction between the government and the general public. Today, such Resource Centers are operating in Alchevsk, Vinnytsia, Dnipropetrovsk, Yevpatoria, Kamyanskyi, Kyiv, Kramatorsk, Lviv, Rubizhne, Sevastopol and Kherson.

The USAID MHR Project, experts prepared three manuals to support creation and development of condominiums: “Energy Efficient Building Step by Step.” The first manual in the series “Step One: Establishment of a Condominium” describes the most efficient ways to start work on establishment of a condominium. This subject is continued in the second volume “Step Two: Organization of Condominium Work”, which contains qualified advice on organization of work with the co-owners, establishment of relations with the providers of housing and communal services, with the government authorities, as well as information on how to protect rights and interests of the condominiums in court. The third manual in the series “Step Three: Capital Renovation and Thermal Modernization of Building” contains advice on how to make a building energy efficient.

Working for the benefit of co-owners, the Resource Centers are also helping the condominiums to work with the authorities and obtain financial support for major renovations, as well as to seek funding for energy efficiency projects from international assistance programs or business sources. Thanks to op-

eration of the Resource Centers, the cities are implementing an important task of increasing the number of responsible housing owners and improving energy efficiency and comfort in their multi-apartment buildings.

Due to activities of the Resource Centers, the information campaign on energy efficiency and condominium development, as well as trainings in the partner cities, the USAID MHR Project has involved 118,000 residents of apartment buildings in condominiums over the three years of their operation. Disseminating the idea of energy efficiency among condominiums, the USAID MHR Project has implemented demonstration projects in 10 condominiums and 20 typical residential buildings.

Advisory Assistance in Creation and Activities of Condominiums through the MHR Project Web Site:

In order to increase access of the residents of apartment buildings to information on creation and management of condominiums, a forum was created on the web site of the USAID MHR Project. Visitors of the site were able to leave their questions and receive answers from the experts online. In addition, every registered user was able to participate in the discussions or create his own topic in the following categories:

- creation and activities of the condominiums;
- tariffs for housing and communal services;
- energy saving;
- social protection and protection of rights of the consumers of housing and communal services;
- examples of successful practice in partner cities.

Best Practices of Condominiums

Lutsk: Assistance to Condominium in Implementation of Energy Efficiency Projects

As recently as in 2010, a nine-floor apartment building at 10 Peremohy Avenue in Lutsk looked like a ruin, even though built not so long ago in 1978. Nevertheless, the structure was in an emergency condition both outside and inside: frayed façade walls, holes in the roofing, rotten plumbing, dark building entrance. Striving to save the building, its residents appealed to the local Housing Management Office (ZhEK); however, they never received support. Driven to despair, the residents called a meeting where they decided to fight the problems on their own. Thus, one of the most successful condominiums, called “Binom”, emerged in Ukraine in 2010.

Having joined forces, the residents immediately started looking for technical experts who would help them deal with at least the most pressing problems, including the worn-out equipment of the heating and water supply systems. Thus, the condominium started its cooperation with the Lutsk Communal Systems Energy Service Company (ESCO), which started a project on the building thermal modernization in 2010 and contacted the USAID MHR Project with a proposal on cooperation. As a result, the Project provided financial support in implementation of a number of energy efficient measures in the condominium building. In the course of implementation, a comprehensive thermal modernization of the building was conducted, in-

cluding: installation of heat metering devices, modernization of the system of heat and hot water supply of the building with installation of automated individual heat sub-station, heat insulation of the build-



Condominium Binom after reconstruction

ing façade and replacement of windows in the building entrances. All these measures were intended to save heat and provide as comfortable indoor temperatures as possible, and ensure uniform distribution of heat throughout all building floors.

Thanks to this cooperation, 50% of heat was saved both in the first (2010-2011) and in the second (2011-2012) heating seasons. As a result of introduced Energy Performance Contract (EPC), the residents pay 7% less than the approved municipal heat tariff, and the ESCO

(investor) is paying to the local heat provider based on heat meter readings. The difference between the heat meter readings and the tariff is a saving that is repaying the UAH 2.5 million investment. The projected investment repayment period is 7-10 years, after which all the installed equipment will become the condominium's property. Thus, the investor is interested in heat saving because only in this way he can repay the invested funds, and the condominium is interested in quick receipt of the relevant property in ownership.

Consequently, conclusion of EPC has made it possible to not only improve the quality and comfort in residential premises, but also save condominium money to take better care of the building site, plant new trees, make a playground for children, all of which has improved the quality of life for residents of the whole neighborhood. After positive experience with implementation of the demonstration project, condominium "Luchany" received a soft loan from the government program at 3% per annum for energy efficiency in Lutsk condominium buildings..

Alchevsk: Condominium Vostok-2003 – First Energy Efficient Building in Luhansk Oblast

As seen from international experience, it is the residents of an apartment building united in their wish to live in a comfortable environment who are the best partners of the government in developing an efficient energy sector. Condominiums can act as such conscientious owners in Ukraine.

To demonstrate the opportunities offered by condominiums in improving energy efficiency and comfort in a residential building to city residents, the Alchevsk municipal government joined its efforts with the USAID MHR Project. Thanks to this cooperation, a common five-storey building (13, Hmyri Street), 125 dwellers of which had set up the condo-

minium "Vostok-2003", was transformed into an energy efficient building in 2011.

As part of this cooperation, the following activities were implemented in the building throughout 2011: old windows and balcony door units were replaced with energy efficient units, two heat sub-stations with weather-based controls allowing for automatic adjustment of temperature according to weather conditions were installed, as well as reconstruction of all inter-panel joints, and the building façade was insulated.

Implementation of the project was financed with funds of the USAID MHR Project - UAH 1,300,000, ISD Alchevsk Develop-

ment Fund – UAH 480,000 and funds of the residents of condominium Vostok-2003 – UAH 100,000.

As a result of concerted cooperation of all parties, Alchevsk now has the first energy efficient building in Luhansk oblast, which consumes 40% less heat energy than before the thermal modernization. Its residents live in warmth and comfort, and additionally, they pay less on the heating bills compared to their neighbors within the same housing district. The municipal government hopes that the project will also help establish condominiums in the nearby buildings, and in other cities of Luhansk oblast.



Condominium Vostok-2003 before reconstruction



Condominium Vostok-2003 after reconstruction

Public-Private Partnership and Investments in Energy Efficiency

In its work with the partner cities, the USAID Project assists in seeking financing and involvement of the private sector in implementation of public-private partnerships and co-financing for implementation of the energy efficiency projects in the communal services sector. Partners of the USAID Project in this socially useful work are: energy company DTEK, Contour Global company, ISD Alchevsk Development Fund, Krymteplokomunenergo utility, energy servicing company “Lutsk Communal Systems”.

Due to cooperation with these partners, the USAID Project helped the cities to raise USD 175 million of public and private funds for the energy efficiency projects, including financing from international financial institutions, state and municipal budgets, commercial banks and private partners.



Signing of PPP agreement with DTEK company and Pavlohrad

Pavlohrad: Energy Efficiency Projects in Public-Private Partnership with DTEK Company

The Pavlohrad secondary school # 19 was due to be closed in winter because of unhealthy low temperatures in classrooms on more than one occasion. For instance, the temperature in classrooms did not rise above 120C on some days in winter.

The situation changed in 2011 when the Pavlohrad City Council, USAID Project and DTEK Pavlohradvuhillya company formed a public-private partnership to pursue effective cooperation in the field of energy saving.

The secondary school # 19 building was selected as a demonstration project for introduction of energy efficient technologies set out in the Pavlohrad Municipal Energy Plan

(MEP). This strategic document, which serves as the guide for the city's development in the area of production, supply and consumption of heat energy, has been drafted with the help of the USAID Project specialists in order to reduce consumption of municipal energy resources and to ensure comfortable temperature in buildings.

Earlier, the USAID Project specialists conducted an energy audit of the school building. The survey indicated that heat was lost due to the unsatisfactory condition of the building's structure which failed to conform to building norms, as well as transportation losses of heat from the boiler house. In fact, heat

energy performance of the building was only about half of that needed for ensuring a comfortable temperature indoors.

Within a short period, 850 m² of windows in the school building were replaced with energy efficient windows, about 3,000 m² of ventilated facade with mineral wool heat insulation was installed, and 400 m² of building basement wall was heat insulated. Also, the heating, water supply, and sewerage pipe systems were modernized with replacement of damaged sections and the pipes were flushed.

As a result of the renovation efforts and implementation of thermal modern-

ization improvements, the temperature inside the school building increased to 21°C which has provided comfortable conditions for all educational processes. In addition, according to expert calculations, the building consumed 40% less energy in the 2011-2012 heating season than in previous heating seasons.

This project is an important visible demonstration of the effectiveness and specific benefits for the community derived from co-financing through public private partnerships on the local level.



Building of school # 19 in Pavlohrad before reconstruction



Reconstructed building of school # 19 in Pavlohrad

Yevpatoria: The City Implements MEP Due to Public-Private Partnership

According to conclusions of the specialists, Yevpatoria is further along with heating sector reforms than other Crimean cities. Key stages of implementation of the municipal energy plan envisioned reduction of the need for heat by 40%.

Sunny Yevpatoria is known for its wonderful resorts. The residents of this city located on Crimea's southern coast seldom suffer from frosty temperatures. But the city's obsolete heat supply system, worn-out equipment, and lack of modern energy efficient measures and heat consumption control units do not ensure comfort in the apartments and are painful for the municipal budget.

The city authorities for a long time sought practical solutions, but modernization of the heating systems requires not only capital investments but also modern and efficient measures that help to increase savings of heat energy consumption and to reduce expenditures.

The solution was found when in 2009 Yevpatoria became one of the first six part-



Yevpatoria City Polyclinic after thermal modernization

ner cities of the USAID MHR Project that were selected for implementation of pilot projects on reforming of district heating systems based on the principle of co-financing. In November that year, the Yevpatoria City Council and the USAID Project signed a Memorandum of Cooperation for the next two and a half years.

First of all, within the framework of cooperation with the USAID MHR Project, an

energy audit of 15 public and private buildings, as well as analysis of the condition of the heating systems were conducted.

The results of the energy audit of the heating systems of Yevpatoria branch of Krymteplokomunenergo utility and results of energy audits of the buildings became the basis for drafting a Municipal Energy Plan (MEP), a mid-term document on heat supply infrastructure development.



Energy efficient project on replacement of outdated boilers with new energy efficient ones in Yevpatoria

One of the MEP priority tasks included implementation of demonstration projects for energy efficiency improvement that envisioned both improvement of the heat supply sources and introduction of energy efficient heat consumption practices.

Experts estimated that implementation of MEP activities would save 30% to 40% of energy resources and, accordingly, of funds that could then be used for development of other municipal sectors.

In 2010-2011, pursuant to the MEP, the following demonstration projects aimed at formation of conscientious consumers for rational use of energy resources were implemented in the city:

1. Installation of heat carrier automated control systems in the heating systems of five buildings;
2. Thermal modernization of the Yevpatoria City Polyclinic;
3. Installation of frequency-regulated fan-drive unit in boiler house (135A, Internatsionalna Street) that is serving a residential district with 13,178 residents;
4. Replacement of inefficient NIISTU-type boilers in boiler house (61, Revolutsii Street) that is serving residential buildings housing 1,003 residents; and
5. Reconstruction and conversion from liquid fuel (fuel oil) to natural gas of boiler house at 1/2, Tuchyna Street that is serving 150 consumers.

Special mention should also be given to a wide-ranging information campaign that focused on efficient energy use and introduction of an optional educational training course “Energy Efficient Schools”.

In 2010, the heat carrier supply control systems (weather-based automatic controls with a circulating pump in the heating system) were installed in four residential buildings (two municipal and two

condominium buildings) and one kindergarten (Kindergarten # 2 “Zolotyiklyuchyk”) in Yevpatoria. The system of metering and control for an apartment building costs approximately UAH 60,000. These systems allow adjusting heat carrier temperature at the inlet according to preset parameters, depending on the ambient air temperature, and they help to reduce heat energy consumption up to 30%.

During the 2010-2011 and 2011-2012 heating seasons, the buildings with installed heat carrier control systems showed a reduction in heat energy consumption of 15% to 30%, even without thermal modernization.

The total saved heat energy in the 2010-2011 and 2011-2012 heating seasons, in comparison with the normative year, was approximately 690 Gcal, or 27% reduction of consumption.

The Yevpatoria City Polyclinic serves about one million residents and visitors of the city per year. A number of energy efficient improvements on thermal modernization of the building were implemented here in 2010 within the framework of the USAID Project. The total cost of works was about UAH 3 million. The walls and roof were thermally insulated, large and regular windows were replaced with PVC insulating windows, the heating system was overhauled, standard lighting was replaced with energy efficient bulbs, the

existing ventilation system was renovated, and a modular gas boiler was installed. The municipal budget allocated UAH 1.9 million in its 2010 budget for major renovation and implementation of energy saving technologies in the city polyclinic. The USAID project allocated UAH 1.2 million for reconstruction and heat insulation of the polyclinic building.

Thanks to these measures, the building's comfort level improved dramatically and heating costs were significantly reduced. Compared to 2009-2010 heating season, total

energy consumption in the building decreased by 46% in 2010-2011. In the heating season 2011-2012, total energy savings achieved were over 55%.

Subsequently, according to the Municipal Energy Plan, two investment projects will be implemented: thermal modernization in the children's hospital isolation ward building and installation of weather-based controls in 27 public buildings. For implementation of these projects, the city successfully raised investors' funds and Kyoto Protocol funds.

Chernihiv: Efficient Interaction with City Authorities



Opening of energy efficient kindergarten # 71 in Chernihiv

For more than two hundred children and employees of Chernihiv Kindergarten # 71, the winter of 2011-2012 was a really comfortable season. This is because thermal modernization of the building was completed before the beginning of the heating season. As a result, the temperature in the premises, which hardly reached 16°C earlier, was raised to 22°C. This was a real gift to the children who now do not have to wear "a hundred clothes". Remembering the previous years, Nadiia Holubeva, teacher of the senior group, says: "Before the renovation, we had to wear everything we could: sweaters and jackets. And today I am wearing just a blouse and I am not cold".

According to experts' assessments, this specific demonstration project will allow the city to save up to UAH 600,000 in the next five years and, most importantly, will increase comfort for children and teachers.

These transformations in the kindergarten became possible due to cooperation of the USAID Municipal Heating Reform Project and Chernihiv City Council, which on 5 July 2011 signed an agreement on co-financing of the energy efficient renovation of Chernihiv Kindergarten # 71. According to the terms of this agreement, USAID provided financial assistance worth UAH 0.9 million. In its turn, the Chernihiv municipal budget allocated UAH 1.1 million.

The works on reconstruction started in fall 2011. The old wooden windows were replaced with energy saving ones, external walls were insulated, the new roof was constructed, the entrance doors were replaced, the heating system was adjusted, and so on.

Liudmyla Meliukhina, teacher of group # 4, who works on the first floor, above the basement says: "There was a nursery here. In the Soviet times, the floor was heated from underneath. And then this heating was cut off. It became very cold. Fungi appeared as a result. The case was reported to the Sanitary Station. The parents were taking their children and transferring them to other kindergartens.

And now the children can wear shorts and T-shirts, even sleep in their undershirts. They bring pajamas but we do not even put them on because it is warm," laughs Liudmyla.

"It's a mercy that the city authorities included our kindergarten in the list of demonstration projects according to the Municipal Energy Plan developed in cooperation with the USAID Project," Tetiana Puchyna, Director, enthusiastically sums up as she stresses that her colleagues from other kindergartens also hope for similar cooperation in the future.



Energy efficient kindergarten # 71 in Chernihiv

Information Campaign on Energy Saving and Support of Condominiums

Within the framework of cooperation with partner cities, the USAID Project conducted a national information campaign aimed at increase of personal responsibility of the Ukrainian citizens for efficient energy consumption in multi-apartment buildings. The slogan of information messages was “Save Heat – Save Ukraine!” The campaign was devoted to the problems of Ukraine’s dependence on imported energy

and heat losses in the multi-apartment buildings which are caused by negligence of the citizens in energy efficiency issues and are the most pressing problems for this country. Objectives of the public education were to develop responsible attitudes of the citizens to consumption of energy resources and personal responsibility for heat consumption and comfort in their homes.

During 2010-2012, as part of the information campaign, 1,400 billboards were placed in Project partner cities, and regional and municipal TV channels were airing video PSAs with information messages on Ukraine’s energy dependence and telling about the practical and low-cost steps that the consumers of communal services may take to save heat in their homes.



Activities on Condominium Development

In 2011-2012, an information campaign promoting creation and development of condominiums was conducted in Kyiv. The billboards and city-street sign-

boards featured a common situation of multi-apartment buildings, where the inhabitants in each apartment feel separated and indifferent to the general comfort



in the building. The posters for this campaign were designed by JWT creative agency in two variants, one depicting a multi-storey building and slogan “Your house is a

pile of problems? Get together and create a condominium!” and “Be at home in your house! Create a condominium!” The posters also featured the USAID MHR

Project web site address where information on how to create and manage a condominium in the most effective way could be found.

Heat Saving Season in Ukraine - Teplomania



Singer Alyosha – headliner of the USAID MHR Project information campaign and “Heat Saving Season” in Ukraine

In January-March 2011, the USAID MHR Project, Ministry of Housing and Communal Services of Ukraine and the Ukrainian showbiz stars held a Heat Saving Season in Ukraine (Teplomania). The main task of this activity was to develop a thoughtful attitude of the young generation to the use of energy resources, as well as to attract attention to the problem of Ukraine’s energy dependence. Four gala-concerts were conducted in January-March 2011. They were part of the specially developed TV project “Teplomania” aired on the Novy Kanal TV channel in the program Showmania. Every

gala concert was devoted to one aspect of how one can warm himself, can save heat in his apartment, city or country as a whole: Teplo Fashion, TeploFengShui, Teplo City and Teplo Ukraine. During the concerts, attended by more than 4,000 people, quizzes on energy efficiency were conducted with showbiz stars and guests, interesting facts and advice about how to get warm in simple and inexpensive ways were presented. The total number of TeplomaniaTV viewers was about 7 million. The Ukrainian showbiz stars were involved in the campaign by sharing their personal experiences of heat

conservation in their homes. The headliner and active participant of the USAID MHR Project information campaign was Alyosha – Ukraine’s representative at the Eurovision contest in Oslo in 2010. The project was also supported by the groups Alibi, Vasyl Bondarchuk, Katia Buzhynska, Para Normalnykh, Pavlo Zibrov, Max Barskykh, Lyuba Fomenko, XL Deluxe and others. As a result of this cooperation, compact discs were issued with advice from the celebrities on efficient energy consumption, as well as their position on the importance of supporting energy saving in Ukraine.

Information Campaign “Heat Meter Installation”

Beginning from March 2012, new USAID MHR Project billboards appeared in Kyiv and other Ukrainian cities. Bright blue billboards with the slogan “Save. Pay Only for What You Have Consumed. Install a Heat Meter in Your Building!” were developed in cooperation with JWT creative agency. The new information campaign was aimed at informing the public about benefits of heat meter installation in their buildings. Additionally, the posters contained a link to the relevant section of USAID MHR Project web site with exhaustive information on the benefits and procedures of heat meter installation (www.mhrp.org.ua).

ЕКОНОМ
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За підтримки Міністерства регіонального розвитку, будівництва та житлово-комунального господарства України

Information Campaign in Metro

Не знаєш, як зігрітися?

Утеплюй вікна та двері — температура підвищиться на 3°C

Збережи тепло – збережи Україну!

Проект USAID «Регіональне теплозабезпечення в Україні»

Не знаєш, як зігрітися?

Не затуляй батарею шторами та меблями — температура підвищиться на 3°C

Збережи тепло – збережи Україну!

Проект USAID «Регіональне теплозабезпечення в Україні»

Не знаєш, як зігрітися?

Зачиняй двері у під'їзді — в усіх квартирах потеплішає на 2°C

Збережи тепло – збережи Україну!

Проект USAID «Регіональне теплозабезпечення в Україні»

Advertising in the metro (subway) was another phase of the national information campaign of the USAID MHR Project. From November 2011, posters were placed along the escalators to remind consumers

about low-cost energy saving measures. In addition, six video PSAs about Ukraine’s dependence from fuel imports and the necessity of saving heat in multi-apartment buildings were broadcast on the metro

station TV monitors. The campaign lasted through the end of the 2012 heating season. The posters and video PSAs were designed by JWT creative agency and Lime Lite Studio.

Energy Efficient Family Contest

From November 2011 through March 2012, the USAID MHR Project together with energy company DTEK and the Kyiv City State Administration conducted the Energy Efficient Family Contest on the social network Facebook. Participants of the contest were Kyiv families interested in implementation of energy efficient measures in their apartments. The contest was open to all Kyivans, irrespective of their age and marital status. The main contest requirements

included coverage of the energy saving methods implemented in their apartments on the contest page in Facebook and writing of a final essay about energy efficiency.

On 25 September 2012, two contest winners were awarded, they both took a thorough approach to energy saving and implementing of low-cost energy efficient methods in their apartments, and fulfilled all conditions of the contest. As rewards, the winners received energy audits of their

apartments conducted by specialists of the Municipal Enterprise “Project implementation Unit of Kyiv Public Buildings Energy Efficiency Project”, and the spots of highest energy losses were identified. Then, based on the results of this energy audit, energy company DTEK replaced old windows and balcony doors with energy efficient ones.

The idea of the contest and its administration in Facebook belong to the USAID Municipal Heating Reform Project.

Energy Efficiency Days in Partner Cities

Within the framework of the USAID Project information campaign, energy efficiency information fairs were conducted in Kyiv, Lviv and Kramatorsk in cooperation with the city councils. They were attended by more than a thousand children and adults in every city.

During these events, all volunteers were able to participate in the interactive games, contests and quizzes on energy saving and energy efficiency. The winners were presented with gifts: hats, scarves, canvas bags, pins, pens with the Municipal Heating Reform Project information campaign logo “Save Energy – Save Ukraine!”

In addition, during the Energy Efficiency Days, the children concert groups and participants of the Energy Efficient Schools Program performed, and an information kiosk was set-up. One could learn from the kiosk about saving heat in multi-apartment buildings and receive information leaflets “10 Tips to Save Heat” and manuals on establishment of condominiums.



USAID MHR Project information kiosk at Energy Efficiency Day in Lviv



Energy Efficiency Day in Kramatorsk

Energy Efficiency Day in Kyiv



ENERGY EFFICIENT SCHOOLS AND CAMPUSES

Implementation of Energy Efficient Schools Program



Kadria Safiulina – author of the manuals for the Energy Efficient Schools Program

In order to assist Ukraine in education of responsible and conscientious future consumers of housing and communal services who know how to save and use heat energy economically, and to pay for the received services on time, the USAID MHR Project has developed and implemented the Energy Efficient Schools Program in 24 Ukrainian schools.

In every participating school, experimental classes were selected, and their students, as an optional course, mastered the fundamentals of heat supply and heat saving, visited the municipal heating utilities, conducted heat audits at school and at home. Furthermore, in every city, specialized school meetings, informational radio briefings, poem and drawing contests on heat conservation issues were conducted,

and school wall newspapers were issued along with other activities.

The methodological basis for the Program are the Schoolchildren Manual for Optional Course in Forms 6-8 and the Teachers' Manual for Optional Course in Forms 6-8. These manuals were developed by the specialists of the Municipal Development Institute as part of the USAID Municipal Heating Reform Project.

In total, participants of the Program that was implemented in two phases in 2009-2010 and 2010-2011 school years were 24 secondary schools from 8 partner cities of the USAID MHR Project: Lviv, Lutsk, Kramatorsk, Vinnytsia, Yevpatoria, Kurakhove, Poltava and Khmelnytsky.

Results of the questioning conducted among 387 schoolchildren, 360 parents and 142 teachers in 12 schools of Phase II confirm that the goal of the Energy Efficient Schools Program was achieved: change of habits and behavior to more energy efficient ones was registered in 94% of parents and 92% of schoolchildren; 100% of schoolchildren from pilot classes participated in heat audits at school and at home; 98% of schoolchildren suggested to the parents and implemented energy saving measures at home. 96% of questioned parents and 99% of teachers consider this Program useful for children and support the idea of its further implementation at school.

As a result, the package of scientific and methodological materials of the Energy Efficient Schools Program was considered by the Commission of the Scientific and



Methodological Council at the Ministry of Education, Science, Youth and Sports and was “approved for use in the secondary schools.”

In 2013, in cooperation with DTEK, the USAID MHR Project extended the Energy Efficient Schools Program in 11 secondary schools of Kyiv. In this new phase, the Kyiv schoolchildren of forms 6-8 not only master the fundamentals of energy saving but also develop projects aimed at reduction of heat and electricity consumption in their schools. Implementation of the best five projects will be financed by DTEK. .



Introduction of the Energy Efficient Schools course for the students of grades 6-8



Implementation of Energy Efficient Campuses Program

Within the framework of the public education work with the young generation, the USAID MHR Project specialists have developed and implemented the Energy Efficient Campuses Program in six higher educational establishments of Ukraine. Task of the Program is to form in the students of higher educational establishments a new type of thinking based on understanding the value of consumed resources, positive impact of resource saving on the environment, climate preservation and sustainable development, and their development as conscientious and responsible consumers of housing and communal services.

The basis of support for the Program is an educational and methodological package that consists of the manual “Energy Saving in Campuses” and a collection of tasks of

the same name developed by specialists of the Municipal Development Institute (MDI) within the framework of the USAID Municipal heating Reform Project. With support of the USAID MHR Project, the pilot universities also received sets of instruments for measuring and conducting energy audits.

Just like the school program, the university program was implemented in two phases. Phase I started in the 2010-2011 school year, and Phase II in the 2011-2012 school year. Three universities took part in implementation of the Program Phase I: National Forestry University of Ukraine (NLTU Ukraine) from Lviv; National Yurii Kondratiuk Technical University from Poltava; Khmelnytsky National University from Khmelnytsky. Three Kyiv universities took part in implementation of the Program Phase II: National Technical

University of Ukraine “Kyiv Polytechnic Institute”, National University of Biological Resources and Environmental Management of Ukraine, and National Academy of Housing and Communal Sector.

Due to participation in the Energy Efficient Campuses Program, a systemic audit of resource consumption in the student campuses and in the universities was introduced on a regular basis; young people started paying more attention to energy and resource conservation, primarily through direct participation in energy saving measures that will ultimately contribute to economical consumption of resources.

As a result, the manual “Energy Saving in Campuses” received approval of the Ministry of Education, Science, Youth and Sports for its use in all public higher educational establishments.



Conference of the Energy Efficient Campuses Program

