Municipal Energy Efficiency Financing

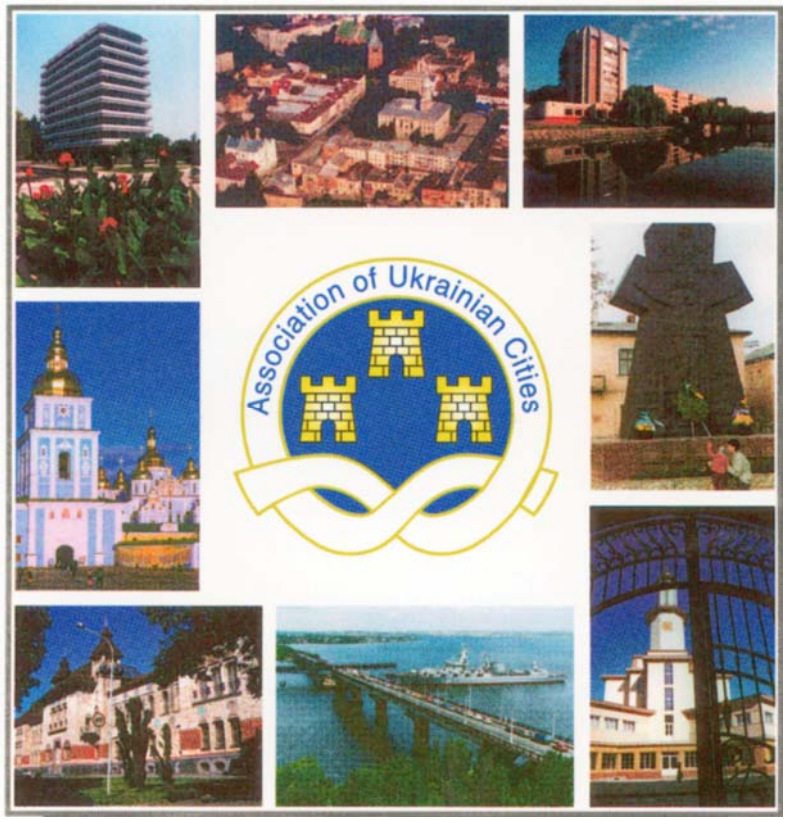
Experience of the Association of Ukrainian Cities

Presented by
Tatiana Yushkevich

Sustainable Development Department,
Association of Ukrainian Cities

The Association of Ukrainian Cities is inviting for cooperation within joint international projects

www.auc.org.ua



The Association has a close cooperation with the National Agency for Efficient Use of Energy Resources of Ukraine (NAER)

- If the country's legislative framework is basically put to order, in 2 to 3 years, we will be able to save up to 25% of the energy resources.
- NAER initiates the development of the following draft laws of Ukraine:

- "Safeguarding the Efficient Use of Resources";
- "Comprehensive State Energy Efficiency Program";
- "Commercial Metering of Resources Transmitted Through the Grids";
- "Use of Combustible Gas as Motor Fuel".

Ukraine's Housing and Utilities require particular attention

- Accidents to have taken place in communities during the 2005-2006 heating season (everybody heard about Alchevsk) proved the engineering network is the weakest link in the "**Boiler House – Thermal Network – Thermal Station – Consumer"** technological chain. The actual heat losses in the networks reach **40%** and in some places – **up to 60%,** whereas the norms say **13%.**

- The state of things in the water supply system is not any better.

- The next slides will show the repeatable nature of the problems for the entire Ukraine's housing and utilities sector, as well as the key indicators that hamper the branch restructuring and development:

Repeatability of Problems in Housing and Utilities Sphere

Low Tariff

Utility's insufficient profit

Poor quality services

Unsatisfactory technical state of fixed assets

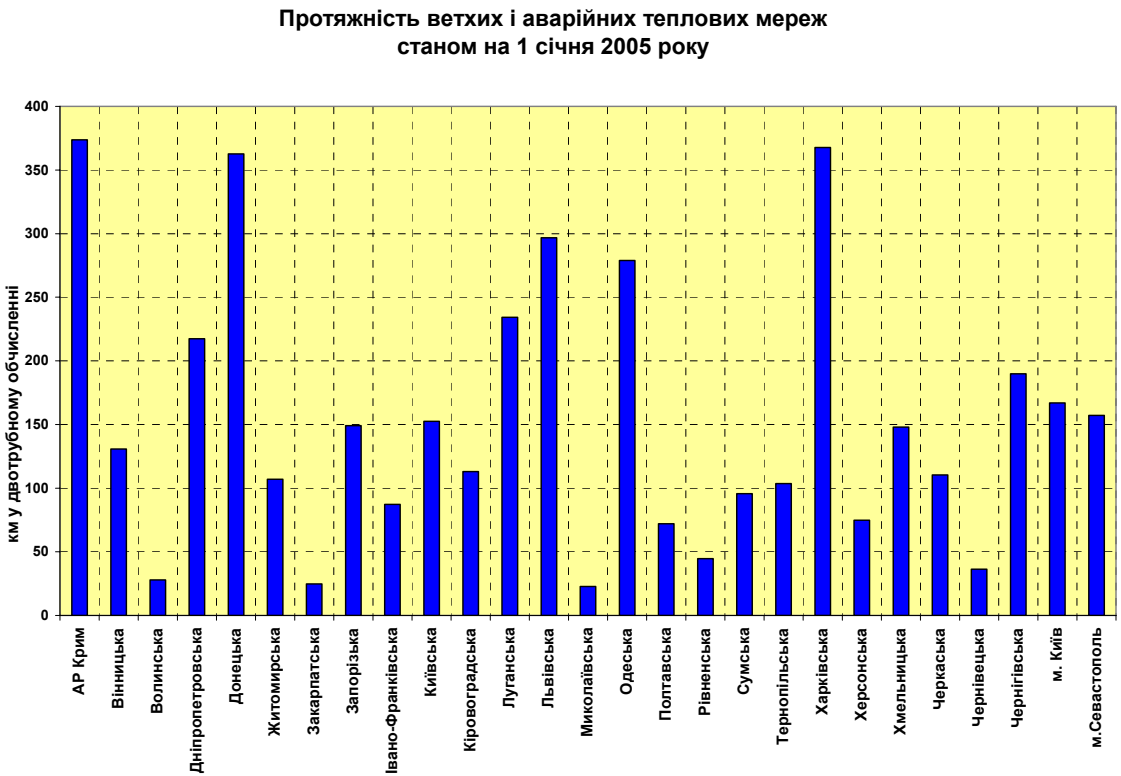
The Key Indicators That Hamper the Branch Restructuring and Development

- Financial incapacity of the local governments;
- Lack of attractive conditions for private investments;
- Imperfect tariff policy;
- Possibility to legally avoid paying for the housing and communal services;
- No national standards for the level and quality of provided services;
- Imperfect legislative and regulatory framework for operation of utilities in the conditions of the market economy;
- Preferential Payment System.

The next slides will provide information about the condition of the heat supply utilities in Ukraine.

Worn-Out Boilers at Heat Utilities of Ukraine

Length of Old and Damaged Heating Networks as on January 1, 2006



Heat and electricity supply schemes should be optimized using only an energy efficient equipment

- Cogeneration plants, as autonomous sources of energy, previously insulated pipes and individual thermal stations and boiler-houses can ensure a reliable supply of energy products to the population.
- Experience of Kiev, Cherkassy, Ivano-Frankovsk, Ternopol may be brought as example.
- Country-wide introduction of controlled electric drive at water supply and sewage facilities will allow for a 40% decrease of electricity consumption, the least.
- The use of modern energy efficient electric lighting systems will save 10 to 20% of electricity. An example may serve the implementation of street lighting renovation projects in Kamenets-Podolsky, Zaporojye, Artemovsk, Makeevka, Jidachiv.

Efficiency of Energy Saving Measures Implementation

Renovation of Boiler-Houses

allows to decrease consumption of:

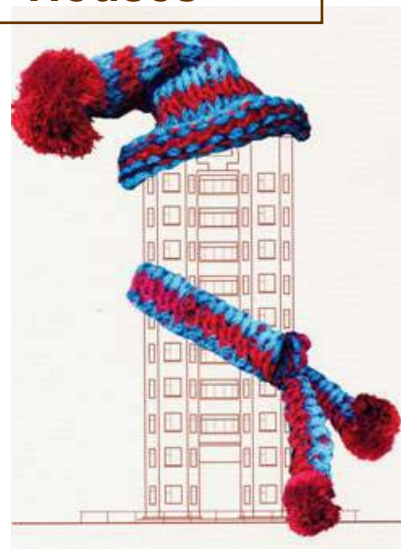
fuel	***10 - 15 %***
electric energy	***20 - 25 %***

Replacement of Heat Networks

allows to decrease heat energy losses by:

15 - 25 %

Winterization of Houses



allows to decrease heat energy consumption by:

40 - 50 %

Important Role of Non-Traditional and Alternative Types of Fuels

- It means using local types of fuel (peat, straw, agricultural wastes, wood industry wastes) and alternative sources of energy, primarily – coalmine methane and synthetic gas.

- Generation of synthesis gas and use of local types of fuel can produce no less than 20 billion tons of equivalent fuel per year. Another 5 billion cubic meters can be annually produced by using coalmine methane.

- That's how the objectives stipulated in the Ukraine's Energy Strategy for the period until 2030 could be attained: to decrease the use of natural gas from 76 billion cubic meters in 2005 down to 49 billion cubic meters in 2030.

Let's now shift gears from all-Ukraine's problems to the solutions proposed by our cities

Energy system holds a central position in the life of any city.

Nowadays, the energy system determines:

- welfare and stability of the city's social sphere;
- level of economy and finances development;
- attraction for investments;
- development prospects.

It is well-known that a significant share of cities' budgets is spent to pay fuel and energy resources (gas, coal, thermal and electric energy). Nowadays one has to choose: to pay for fuel and electric energy or to pay out wages to doctors, teachers, clerks.

Successful reforms in the housing and utilities sector and the pace of collection of a 100% payment for housing and communal services depend namely on the condition of the energy system.

Solution of key problems of Ukraine's municipal energy system using Odessa example

- I will dwell upon the city's energy saving program and the sought investments to finance this program's activities.
- Such "Best Practice" is included in our digest. This project was to a large extent possible due to Yurii Tasimov, former head of Department of Coordination and Development, Odessa Municipal Council, deputy head of the Administration of Fuel and Energy Complex.

THE FOLLOWING COULD BE REFERRED TO AS THE MAIN PROBLEMS OF THE CITY'S ENERGY SYSTEM:

- technical wear and tear, and obsolescence of heat supply utilities' fixed assets (by the beginning of the first stage of the project, the wear and tear was 65-70% of the initial cost, and the critical level of accident risk – 60%).

  As for the water supply and sewage system, this indicator is at the level of 55%;

Solution of key problems of Ukraine's municipal energy system using Odessa example

- total absence of centralized and budget financing for capital construction. In recent years, the actual financing have not exceeded 20% of the planned amounts. Annually, because of scarce finances, no more than 4.5% of the needed heat networks are re-laid. Besides that, different departmental affiliation of heat supply organizations complicated the work with investors, in terms of attracting financial resources for construction of a new CHP and reconstruction of the city's heat supply system;
- Chronic non-payments and "pressed" debts for supplied communal services, accumulated during the previous years, including the debts of the central budget, did not allow to timely purchase fuel and materials;

Solution of key problems of Ukraine's municipal energy system using Odessa example

- lack of skilled energy management at communal utilities and absence of a coordinating authority within municipality;
- low awareness of the population and managers of utilities on issues of efficient use of fuel and energy resources and energy saving;

Certainly, there are more problems, but the current situation challenged the city authorities to adopt their own decision, specifically- DECISION TO IMPROVE THE CITY'S HEAT SUPPLY AND TO EFFICIENTLY USE ENERGY IN ODESSA TADAY AND IN FUTURE.

Solution of key problems of Ukraine's municipal energy system using Odessa example

Annual Energy Consumption in Odessa

- 35.0 thousand tons of coal,
- 1.0 thousand tons of oil products,
- 1.0 billion cubic meters of natural gas,
- 2.8 million Gcal of thermal energy,
- 2.4 billion kWth of electric energy.

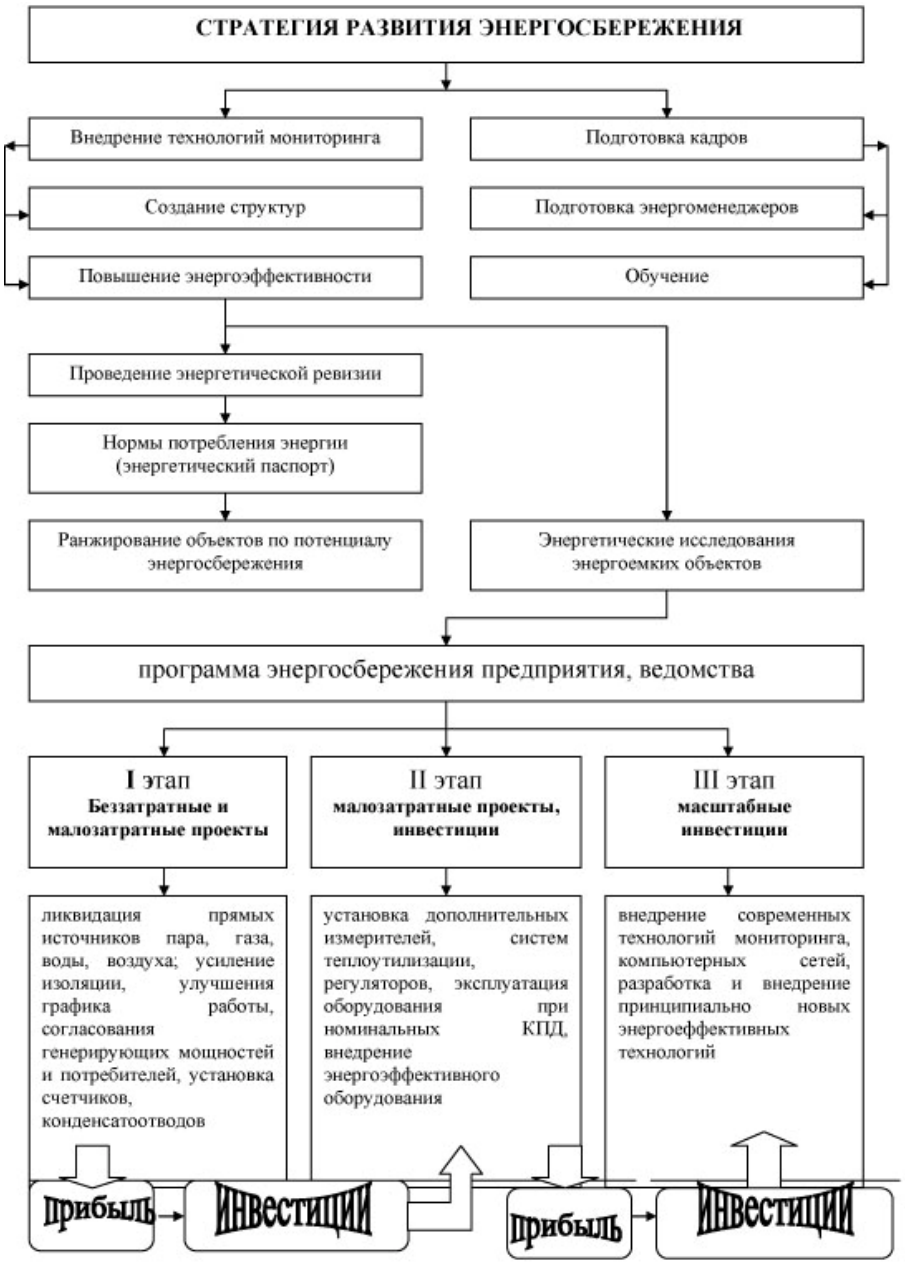
Solution of key problems of Ukraine's municipal energy system using Odessa example

- Energy saving should become the reform's central element. The following is our understanding of energy saving at the level of city:
- First, energy savings should be regarded as a resource for repayment of possible investments into development of the housing and utilities sector.
- Second, the social effect of energy saving should bring along mitigation of the social strain, caused by transition to the full payment of consumed energy resources.
- Third, energy saving should lead to increased quality of services rendered to the population, to their compliance with the adopted standards.

Solution of key problems of Ukraine's municipal energy system using Odessa example

- Four, energy saving should be carried out together with improvement of relations between companies that supply resources (as suppliers of services) and consumers of such resources – the population.
- And, five, energy saving should lead to concrete activities targeted to implementation of energy saving technologies, which main objective is to reduce the consumption of fuel and energy resources and to create a system of resources metering, which would be as close to consumer as possible and that would allow to clearly determine the amount of consumption and the level of losses in the entire technological chain (from producer to consumer).

The energy saving development strategy is shown in the following slide and it represents an effective self-finance mechanism, provided there is a sufficient number of concurrent factors.


СТРАТЕГИЯ РАЗВИТИЯ ЭНЕРГОСБЕРЕЖЕНИЯ
Внедрение технологий мониторинга
Подготовка кадров
Создание структур
Подготовка энергоменеджеров
Повышение энергоэффективности
Обучение
Проведение энергетической ревизии
Нормы потребления энергии (энергетический паспорт)
Ранжирование объектов по потенциалу энергосбережения
Энергетические исследования энергоемких объектов
программа энергосбережения предприятия, ведомства
I этап
Беззатратные и малозатратные проекты
II этап
малозатратные проекты, инвестиции
III этап
масштабные инвестиции
ликвидация прямых источников пара, газа, воды, воздуха; усиление изоляции, улучшения графика работы, согласования генерирующих мощностей и потребителей, установка счетчиков, конденсатоотводов
установка дополнительных измерителей, систем теплоутилизации, регуляторов, эксплуатация оборудования при номинальных КПД, внедрение энергоэффективного оборудования
внедрение современных технологий мониторинга, компьютерных сетей, разработка и внедрение принципиально новых энергоеффективных технологий
прибыль
Инвестиции
прибыль
Инвестиции

Solution of key problems of Ukraine's municipal energy system using Odessa example

- It is namely the absence with budgetary organizations of a revolving financing mechanism to finance energy efficiency projects that does not allow to start the wheel of energy saving program at full performance.

To implement the Energy Saving Program it is necessary to:

- Improve the energy saving legislative and regulatory framework at the city level;
- Carry out a total audit of business entities, regardless of types of ownership;
- Implement modern energy saving technologies in all branches of the national economy, replace outdated, inefficient equipment;
- Develop and implement efficient mechanisms to support energy saving at the producers' and consumers' end and a mechanism to punish for wasteful attitude towards resources;

Solution of key problems of Ukraine's municipal energy system using Odessa example

- Search internal sources of financing, as well as investors and loans;
- Carry out awareness-raising campaigns among producers and consumers of energy resources, among the youth and students;
- Create a system of step by step training in energy management;
- Carry out regular conferences-exhibitions under the slogan "Odessa is An Energy Efficient City";
- Attract bank money, UN funds, State Committee for Energy Saving funds, UkrESCO funds, etc.

The main objective of the Program is to preserve energy consumption at the current level, or even at a lower level, and to simultaneously increase overall production and quality of communal services.

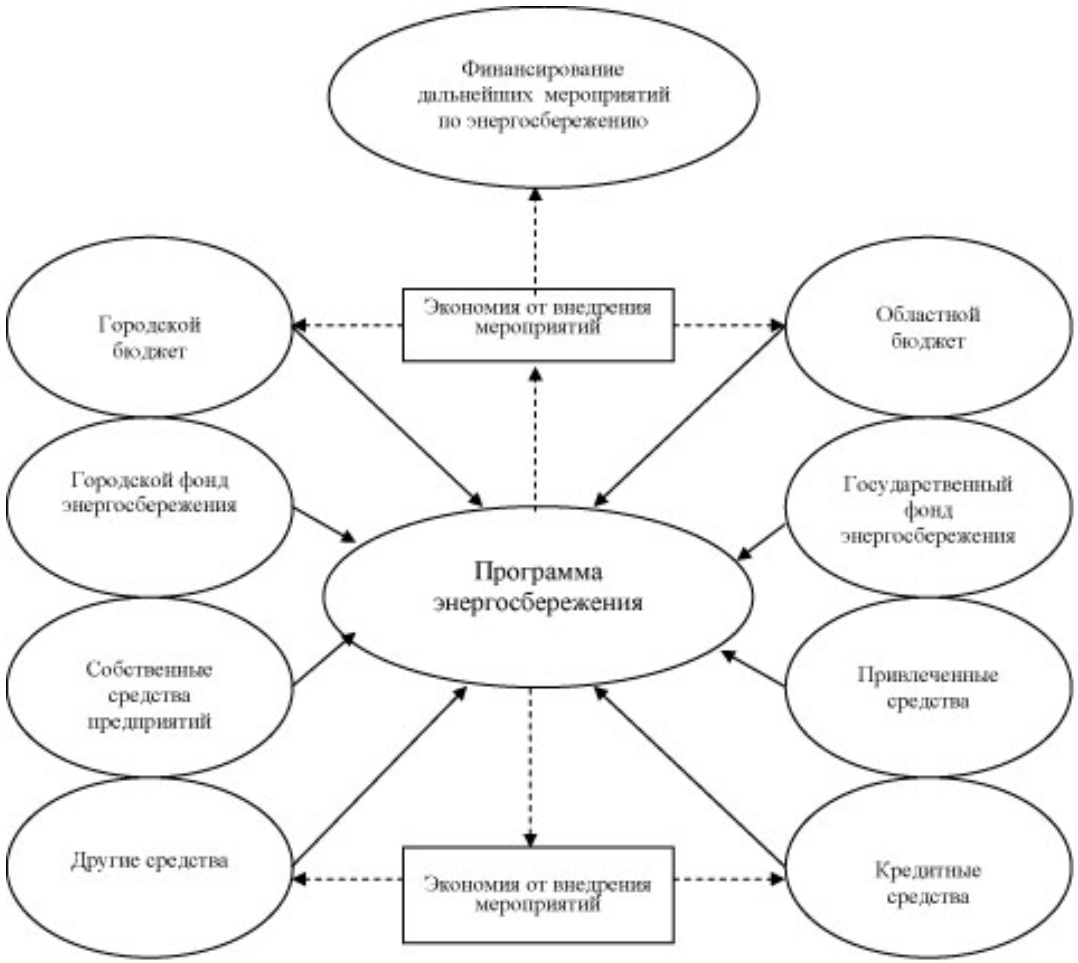
The municipal energy saving projects in Ukraine are financed from the following sources:

- own funds of municipal utilities that carry out the projects;
- leasing schemes, which are used for supply of equipment;
- allocations from local, oblast, or state budgets for energy saving and payments for energy carriers;
- Credits for investment projects;
- international technical assistance funds.

The Program's sources of financing can be integrated in two main groups: budgetary funds, own and attracted funds of utilities and organizations.

The next slide will show the Program's financing structure. The amount of Program's financing from the budgetary funds is specified during municipal and oblast budgeting for the corresponding financial year.

Extent Program's Financing Sources



Extent Program's Financing Sources

- The municipal Energy Saving Program should be financed from investments-subsidies to enterprises, which supply fuel- and energy saving equipment; loans to energy saving projects; payment of a part of interests for enterprise's loan.
- Energy carrier saving, attained due to implementation of low-cost energy saving measures, is an important source of Program financing. Such measures include logistics, introduction of a mechanism stimulating and encouraging saving, metering of consumed resources under differentiated tariffs, prevention of energy resources losses.

Extent Program's Financing Sources

- Total saving of fuel and energy resources in 2003-2006, including implementation of Program's key energy saving measures in the housing and communal sector of Odessa, will make up 107.62 thousand tons of equivalent fuel (6.6 million USD in money terms).

  Electric energy and heat energy saving in 2003-2006, correspondingly:
- Electric energy (million kWn year) – 95.60
- Heat energy (thousand Gcal) – 110.94

  Given the stage-based Program's financing and the average payback period of energy saving measures (4-6 years), one should expect significant fuel and energy resources saving in 2008-2009.

  The economic effect of energy saving measures, which increase the energy efficiency of production, will be:

Extent Program's Financing Sources

- supplemented with production of energy saving equipment, technical instruments, materials and constructions, which introduction in Odessa and other regions of Ukraine will contribute to shifting the economy to the energy saving path of development.

- Reduction of Odessa economy's needs for energy resources in 2003-2006 will allow to cut on emissions of harmful substances into the atmosphere by more than 4%, and to consequently decrease the emission of about 500 thousand tons of greenhouse gases. This, in its turn, will become Odessa's most important step towards meeting the requirements of the Kyoto Protocol to the United Nation Framework Convention on Climate Change and will be one of the factors to help attract investments to Odessa's economy.

The Association on Ukrainian Cities is inviting for cooperation within joint international projects. www.auc.org.ua