ENERGY SERVICE CONTRACTS
Opportunities and prospects in Ukraine
Authors’ note

Energy Service Contract, as an organizational, legal and financial mechanism that allows reducing consumption of energy resources through implementation of energy saving measures, has widely spread in the world’s developed countries within the last 40 years. Popularity of this mechanism could be explained primarily by its investment attractiveness, a possibility to combine the interests of customers and contractors of energy saving works including the suppliers of energy efficient equipment on a mutually advantageous basis. In addition, this mechanism allows resolving complex issues pertinent to attraction of necessary resources for implementation of energy efficiency projects.

In the last years, the practice of implementation of energy service contracts was exposed to the research by scientists, entrepreneurs and financiers from different countries of the world; it is being discussed in specialized communities and publications; as it requires adaptation to the legal specifics and business traditions in each individual country.

This experience is crucial for Ukraine as it currently only makes its first steps towards improvement of energy efficiency despite high energy intensity of its economy.

The authors have summarized international experiences of implementation of energy service contracts, made an overview of effective European and Ukrainian legislation, as well as practical attempts to implement energy service in Ukraine, analyzed the barriers of its application and formulated proposals as to the ways to overcome those barriers.

No doubt, activities in the area of energy saving should cover all sectors of the national economy. However, with the view of the fact that utilities take a considerable share in the structure of the final consumption of energy resources (almost 34%), the publication makes an emphasis on the analysis of the problems and prospects of implementation of energy service contracts particularly in this sector. Besides, this is also due to existence of direct obstacles for implementation of energy service contracts in the public sector, high social sensitivity of the utility consumers with regard to the growth of prices for energy resources and the need for the state to create relevant framework conditions for motivation of implementation of energy efficiency measures.

In the authors’ opinion, the publication would inform a broad circle of readers willing to obtain information on the state-of-art organizational and legal approaches to the ways of reduction of the consumption of the fuel and energy resources, primarily, potential recipients of energy services of the generally accepted concept of the energy service contracts, organizational and legal principles of their drafting and implementation. The authors believe that the publication may also be helpful for energy service providers as it contains an overview of some practical aspects.

The authors would like to express special thanks to Wolfram Rehbock for his ideas and contributions to the preparation of this publication. We also thank to all the companies for providing their valuable input into drafting this Guide, including: Communal Enterprise CJSC UkrESCO, Communal Enterprise KyivESCO, CJSC ESCO Ecosys, ESCO-CENTER LLC and ESCO Lutsk Communal Systems LLC, and others.
## List of abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>E5P</td>
<td>Eastern Europe Energy Efficiency and Environmental Partnership</td>
</tr>
<tr>
<td>GIZ</td>
<td>Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH</td>
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<td>SEAP</td>
<td>Sustainable Energy Action Plan</td>
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<td>SIDA</td>
<td>Swedish International Development Agency</td>
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<td>UKEEP</td>
<td>Ukraine Energy Efficiency Program</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WWF</td>
<td>World Wildlife Fund</td>
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<td>OJSC</td>
<td>Open Joint-Stock Company</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>RES</td>
<td>renewable energy source</td>
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<td>DHW</td>
<td>domestic hot water</td>
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<tr>
<td>SFS</td>
<td>State Fiscal Service of Ukraine</td>
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<td>EP</td>
<td>electric power</td>
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<tr>
<td>EPC</td>
<td>Energy Performance Contract</td>
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<td>ESC</td>
<td>Energy Service Contract</td>
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<td>ESCO</td>
<td>Energy Service Contract</td>
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<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<tr>
<td>EIB</td>
<td>European Investment Bank</td>
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<tr>
<td>HUS</td>
<td>Housing and Utility Sector</td>
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<tr>
<td>CMU</td>
<td>Cabinet of Ministers of Ukraine</td>
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<tr>
<td>CE KyivESCO</td>
<td>Communal Enterprise KyivESCO</td>
</tr>
<tr>
<td>CE DMESCO</td>
<td>Communal Enterprise Dnipropetrovsk Municipal Energy Service Company</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>SME</td>
<td>small and medium enterprises</td>
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<tr>
<td>IFI</td>
<td>international financial institutions</td>
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<tr>
<td>NEFCO</td>
<td>Nordic Environment Finance Corporation</td>
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<tr>
<td>NEURC</td>
<td>National Energy and Utilities Regulatory Commission</td>
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<tr>
<td>NAPRE</td>
<td>National Action Plan for Renewable Energy</td>
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<tr>
<td>NEEAP</td>
<td>National Energy Efficiency Action Plan</td>
</tr>
<tr>
<td>ABCOA</td>
<td>Apartment Building Co-Owners Association</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>CCI</td>
<td>Clinton Climate Initiative – Clinton Foundation</td>
</tr>
<tr>
<td>toe</td>
<td>ton of oil equivalent</td>
</tr>
<tr>
<td>DH</td>
<td>district heating</td>
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I. ENERGY CONSUMPTION AND ENERGY EFFICIENCY POTENTIAL
The extremely high consumption of energy resources in Ukraine per GDP unit, dependence upon Russian natural gas, and deterioration of the energy infrastructure made energy saving and energy efficiency into priority areas of the Ukrainian Government's energy policy. For instance, *Energy Strategy of Ukraine for the period to 2030* stipulates that the GDP energy intensity level can be reduced almost by 60% in the baseline scenario of economic development, provided energy efficiency measures are implemented.

According to the Strategy, one of the key areas of the state policy for energy efficiency is the stimulation of Energy Service Companies (ESCO) in order to implement energy efficiency measures through development of the relevant regulatory framework and introduction of the Energy Performance Contracting mechanisms (EPC).¹

According to the *Energy Balance of Ukraine for 2013*,² the largest end users of energy in Ukraine in 2013 were: industry (about 31.5%), domestic household (housing) sector (almost 34%), and transport (over 16%). The total end-user energy consumption by the household sector was almost 23,500,000 tons of oil equivalent (toe).

The structure of end consumption in the household sector in 2013 by the types of fuel is as follows: natural gas – 57.52% of the total energy consumption, electricity – 15.15%, thermal energy – 19.86%, biofuel and waste – 4.24%, coal and peat – 3.11%, oil and oil products – 0.12% (Graph 1). Thus, households mainly use natural gas and electricity. However, new, energy efficient technologies have not yet become common in this sector due to lack of proper incentives.

Statistics show that housing stock consumes 70% of heat. About 40% of the generated thermal energy is lost due to poor thermal characteristics of the enclosures (envelopes) in residential buildings of mass construction, which constitute a third of the housing stock, while the losses in the heat distribution networks are up to 25%.³

Many problems in the housing sector arise from the poor condition of structural elements in a considerable part of mass construction buildings originating from 1960-80s, and from the poor energy characteristics and inefficient maintenance of such buildings.⁴

Due to the fact that the main part of Ukraine’s housing stock was built when energy prices were still relatively low and in addition were subsidized, there was no need to think about any energy saving. According to the estimates of the World Bank, the potential of reduction in natural gas and thermal energy consumption in the housing sector of Ukraine is up to 50%.⁵

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¹ “Energy Strategy of Ukraine for the Period to 2030”. – Available at: http://zakon0.rada.gov.ua/laws/show/n0002120-13/paran3#n3.
⁴ According to the data of the Ministry of Regional Development, Construction and the Housing and Utility Sector consumption and losses of heat in most of the multi-family buildings in Ukraine are 3 – 3.5 times higher than European consumption standards. According to the estimates of the State Energy Efficiency Agency modernization of the housing stock in Ukraine by 2020 will require about UAH 1 trillion. Based on the calculations of the Institute of Gas of the National Academy of Sciences, reduction to the heat losses in Ukraine as a result of heat modernization of buildings may reach 41%. In money equivalent, the economy of budget funds is estimated at the level of UAH 150-600 billion. The Cabinet of Ministers will partly compensate the costs of installation of non-gas boilers and heat insulation of buildings. – 09.04.2015. – Available at: http://cda.agency/news/Kabmin-chastkovo-pokryvatyme-vytraty.
⁵ Теплий дім. І заощадимо, і не змерзнемо. – Available at: http://www.ukurier.gov.ua/media/documents/2014/10/22/spec.pdf.
In the Overview of the Energy Policy of Ukraine prepared by the International Energy Agency, the energy saving potential of Ukraine is estimated at 27,000,000 toe.\(^6\)

Energy efficiency of the housing sector can be increased through a set of appropriate measures. For instance, National Action Plan for Energy Efficiency for the period to 2020 stipulates that using ESCOs is one of the tools for implementation of such measures. The Ukrainian Government ordered State Agency for Energy Efficiency and Energy Saving of Ukraine, in cooperation with international financial organizations in Ukraine and Ukrainian banks – represented by UkrExImBank PJSC and the OschadBank State Savings Bank of Ukraine – to analyze the experience in implementation of energy saving projects utilizing ESCOs. This analysis confirmed efficiency and economic expediency of project implementation using energy service contracts.\(^7\)


II. ESCO Concept
2.1. ESCO Concept. Key definitions

ESCOs emerged in the 1970s in the United States as a response to the energy crisis. One of the first ESCOs was Time Energy (Texas) that offered an automated switch for lighting and other equipment (“timer”) based on the energy consumption needs. The initial sales of the device were slow in part because potential buyers doubted whether it offered any real savings. In response, Time Energy decided to install the equipment at the customer’s site in exchange for the share in the actual savings. In essence, it was the classic ESCO model.8

Later, the ESCO model gained popularity in other countries. Today, ESCOs are used to introduce energy saving measures to increase energy efficiency of energy supply and energy consumption (generation/cogeneration and supply of energy, heating, ventilation and air conditioning, lighting, technological processes, exhaust heat recovery, energy consumption management systems, improvement of thermal characteristics of buildings, etc.).

The concept of ESCO is explained in the Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services.9 The document states:

‘energy service company’ (ESCO): a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user’s facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.10

On June 5, 2014, this Directive was replaced for EU states with Directive 2012/27/EU on energy efficiency dated 25 October 2012.11 In October 2015, the decision was passed on implementation of Directive 2012/27/EU on energy efficiency for the Energy Community including Ukraine.

Directive 2012/27/EU does not provide a definition of ESCO replacing it with the concept of Energy Service Provider with the following definition:

‘energy service provider’ means a natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer’s facility or premises.

Directive 2012/27/EU on energy efficiency also provides a definition for Energy Service:

‘energy service’ means the physical benefit, utility or good derived from a combination of energy with energy-efficient technology or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to result in verifiable and measurable or estimable energy efficiency improvement or primary energy savings.

In Ukrainian legislation, the definition for Energy Service Company is provided in the Order of the Ministry of Housing and Utility Sector of Ukraine “On Approval of Procedural Recommendations for Establishment of Economic Stimulus System to Implement Energy Efficiency Measures in Organizations of the Housing Sector”:

Energy service company is a business entity that implements energy saving measures in full or in part with its own, borrowed or debt funds and guarantees savings of fuel and energy resources and water during the period of implementation of energy saving measures.12

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There are two types of agreements for energy efficiency improvement: Energy Service Contract (ESC) and Energy Performance Contract (EPC). However, neither Directive 2006/32/EU, nor Directive 2012/27/EU, provide a definition of Energy Service Contract. We believe it appropriate to give our own definition of Energy Service Contract in this work:

ESC is a contract regarding implementation by the provider of energy saving measures and improvement of energy efficiency of the customer; the contractor’s (ESCO) reward is directly related to the customer’s savings attributable to the implementation of such measures.

At the same time, Directive 2006/32/EU defines EPC as:

‘energy performance contracting’ means a contractual arrangement between the beneficiary and the provider (as a rule, ESCO) of an energy efficiency improvement measure, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement.

It is worth noting that in the official translation of Directive 2006/32/EU by the Ministry of Justice of Ukraine EPC is rendered as “Energy Production Contract”. We believe that this changes the very definition and concept of energy contracting. In addition, the translation states that investments are “made” in accordance with the level of increase in efficiency of energy use agreed upon in the contract, while the original text contains the word “paid”. This changes the logic behind energy contracting where investments are made first and the compensation comes in the form of resulting savings, not the other way around.

It should be noted that Directive 2012/27/EU gives a broader definition of EPC than Directive 2006/32/EU. This definition incorporates financial savings in addition to the savings in physical terms:

‘energy performance contracting’ means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.

Considering the abovementioned, we believe it possible to define ESCO as follows:

‘Energy Service Company (ESCO)’ is a business entity that implements energy efficiency measures using the energy contracting model.

When it comes to ESC and EPC, the international practice sees the main difference between the two as follows: EPC provides the full range of measures aimed at energy savings and improvement of energy efficiency by the customer (“a turn-key package”), while ESC is a broader concept and may include either the full set (EPC) or individual types of energy services (for instance, energy audit, supply of equipment, leasing of equipment, project development, etc.).

It is important to note that ESCO definitions differ from country to country. Usually ESCO stands apart from other types of companies that offer energy efficiency improvement or energy services, such as consulting firms and equipment contractors. ESCO business model provides for the profitability of services attributable to the volume of energy saved (both in physical and financial terms). Energy services may include, for example, energy audit, energy management, supply of energy or equipment, space-heating services.14

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Therefore, ESCO is a company that offers energy services, which may include preparation and implementation of energy saving projects (as well as renewable energy projects) that are often implemented on a turnkey basis. ESCO has the following characteristics:

- ESCO guarantees savings in electric power and heat and/or the same level of energy services at a lower cost. The performance guarantee may be provided in various forms: it may be tied to the actual reduction of energy consumption in physical terms or reduction of the costs for energy consumed.
- ESCO’s reward is directly related to the energy savings achieved.
- ESCO may fund or assist in organization of funding of energy efficiency projects by providing guarantee of savings.

The savings achieved in energy services can include the following elements:

- Savings on fuel/energy costs;
- Savings on personnel costs;
- Savings on maintenance costs;
- Savings on other operation costs (material, water, etc.).

A typical list of ESCO services includes:

- Energy audit;
- Technical and economic justification of suggested measures for energy saving and energy efficiency;
- Provision or procurement of financial and investment management;
- Management of financial and technical risks of energy saving measures;
- Engineering (implementation), installation management, and supervision of energy saving measures;
- Supply and installation of equipment; operation and maintenance, other.

Experience proves that to achieve the best results from the project implementation with the energy service mechanism, the following rules should be followed:

- Energy efficiency measures should be paid (covered) by the level of energy savings achieved;
- Projects should be fully implemented by a specialized company (ESCO);
- Investments, debt service and costs of energy services (total value of the energy performance contract) should be gradually paid by the ESCO (or beneficiary) throughout the period specified in the agreement once the annual savings of operation costs have been reached;
- Performance contracts should span the entire period required for full offset of costs of energy savings measures implementation;
- ESCO should assume all financial and technical risks;
- There should be a guarantee of sustainable savings on energy costs and other operation costs.

2.2. ESCO: Scope of Activity

As was previously stated, ESCOs play an important role in realization of the energy efficiency potential in developed countries. In existing common practice, ESCO services constitute a uniform set of measures which are paid by the customer using the savings on energy resources with the funds which would have been used otherwise for their procurement. ESCO guarantees such savings and ensures that, once the energy savings measures have been implemented, the energy consumption costs do not exceed pre-agreed levels. This ensures a low risk level for the customers of energy services. In such a contract the parties can choose for two options on how to define savings: either to agree savings in financial terms, or specifying the guaranteed amount of saved energy. If the projected level of energy savings is not achieved within the period of the project implementation, ESCO does not receive the reward in the expected amount. Contracts are concluded for specific periods (as a rule, 5-10 years), during which ESCO investments are repaid.
In North America and Western Europe, ESCOs offer their technological and financial services for implementation of energy efficiency measures, and they guarantee the sufficiency of the energy savings resulting from the projects to cover the project costs within a certain time period. That is, ESCO is a tool that allows a customer to achieve its energy saving potential using an economic model (EPC) that helps to overcome a number of economic obstacles. In theory energy service activities are highly attractive and allow entities to fulfill their considerable energy savings potential. In practice, however, ESCOs have been less than successful in certain countries due to the lack of necessary framework conditions for their activities in these countries.

ESCO activities have different priority levels in different economy branches. The priority level depends on market conditions in each country. In particular, key customers of ESCO services are often the public (municipal) sector, industry and housing sector. The public (municipal) sector represents a major share in the ESCO project portfolio since it provides an easier access to financial resources and allows its customers to reduce budget expenditures on maintenance of public (municipal) facilities. In some countries, main clients of ESCOs are industrial companies, whose owners have a business interest to reduce the share of energy in the cost price.

ESCO experiences in developed economies can play an important role in the improvement of energy efficiency of both the Ukrainian housing and utility sector and industry, both of which have significant energy saving potentials.

2.3. Risks of energy service contracts

As previously stated, energy service contracts are associated with certain inherent risks. They include risks for both ESCOs and the customers.

2.3.1. Risks for energy service companies

As it was mentioned before, an ESCO takes certain risks partially (or in full) in order to achieve improved energy efficiency of the customer’s facility, and gets paid (in part or in full) for the services provided on the basis of the results of the improvement in energy efficiency.

Main risks ESCOs encounter:

- Business risks: Risks associated with errors/miscalculations in selection of the business model for the project, identification of profitability indicators, changes in legislation or political environment in the country, selection of partners/participants for the project and probability of their failure to carry out their obligations, etc.;
- Financial risks: Risks associated with probable loss of financial resources/funds, for instance, due to inflation, unfavorable market conditions in markets of goods, services, materials, etc.;
- Technical risks: Risks associated with incorrect technical solutions, improper operation/maintenance and/or unforeseen equipment failure.

For instance, use of inaccurate input data to calculate fuel and power consumption once the energy efficiency measures have been implemented can lead to errors in projected savings numbers. Particularly, when the energy audit conducted at the outset was of poor quality. This may occur, for example, when the customer had already had an energy audit conducted by a different contractor and is not willing to incur any additional expenses. The new contractor, however, has every right to doubt the quality of such previous energy audit. In cases when an energy audit was previously performed by another company it is worthwhile for the ESCO to verify it request a new energy audit.

As noted previously, a realistic and precise baseline of energy consumption is of utmost importance because mistakes in its setting can lead to failure to reach the planned energy efficiency indicators in the future and to disputes between the ESCO and the customer up to termination of their contract. It happens, however, that ESCOs have to deal with the fact that a facility has no heat metering equipment or lacks reliable data on energy consumption levels for even a year or two back that are needed to set the baseline.

This is a typical risk for ESCOs, and it is the ESCOs’ interest to set correct agreed-upon indicators for the consumption of fuel and energy resources, savings assessment, and respective profits from the measures implemented and economy achieved.

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19 As we understand, supply of equipment is considered to be ESC on condition that the payment for the purchased equipment will be at the cost of the savings achieved as a result of operation of such equipment.
II. ESCO Concept

When it comes to the fluctuation of prices on energy resources, the utility tariffs are more likely to grow than to decrease. It is advisable to set projected figures of the increase in energy prices and in the respective tariffs in the agreements.21

Another risk faced by the contractor is the customer’s violation of the terms and conditions of payments for services provided. It may happen, for example, when the customer notices the savings resulting from energy efficiency measures implemented by ESCO and starts looking for ways to pay based on the actual consumption indicators after the energy efficiency measures were implemented rather than by the terms and conditions stipulated in the agreement. It creates the risk for ESCOs of not recovering investments made and of not receiving the expected profit. In order to avoid this, an ESC should be properly drafted with the obligations of both the contractor and the customer clearly described, together with as well as their liability for nonperformance of their obligations.

Another risk an ESCO runs is the customer’s inability to pay. When the customer/consumer declares bankruptcy, it is usually impossible to recover the investments made. This risk is relevant for investors: a financial institution, a leasing company, a manufacturer of energy saving equipment, etc. It could also be relevant for an ESCO if it acts as an investor funding the project for the customer. This is why any potential investor should make sure that the prospective energy service customer is solvent.22 ESCOs often prefer to work with public institutions in order to avoid the said risk.

The risk of non-compliance by the customer/operating organization with the rules for equipment operation can be mitigated by an ESCO through staff training and by creating conditions in which the customer will also have an interest in achieving the savings.23

2.3.2. Risks for the Customer

The customers’ risks are related to:

Selection of an ESCO:
Imperfection of existing legislation.

When selecting an ESCO, the customer runs the risk of selecting an incompetent contractor. This can be avoided by proper research of available information on companies operating in the energy service market. When selecting a contractor, it is advisable to find out whether the ESCO has experience in successful implementation of energy efficiency projects – and, when possible, get reviews from its previous customers – whether it has skilled experts, and obtain detailed information on their work terms (EPC model) and payments for the work performed. In our opinion, it is advisable to develop a centralized and transparent mechanism for ESCO selection in Ukraine.24

2.4. Special Aspects of Energy Service Contracts

The key issue for an Energy Service Contract is to define a procedure for assessment of energy savings. This is where energy consumption baseline is used (the parties must define the indicators and the period of time that will be used as the basis; both these characteristics are subject to discussion and approval) to calculate savings in energy consumption and funds resulting from the increased energy efficiency. When setting this baseline the parties should consider potential changes in energy consumption modes, for instance, increase or decrease in company’s production volumes.

It is also recommended to describe in the contract the mechanism that will be used to achieve savings of energy and funds. For instance, Russian legislation stipulates that the baseline consumption recorded in an ESC must be based on metering equipment records; the savings resulting from the installation of such metering equipment cannot be credited to an ESC because such installation is in essence a transition from paying for estimated consumption to paying for actual energy consumed.25 This is provision is easy to explain: installation of metering equipment does not constitute an energy efficiency measure in its usual meaning. Theoretically, the use of metering equipment results

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21 It should be noted that EBRD insists on having ESC tied not only to the physical saving but also to the financial economy because ESCO may offer certain measures of the so called energy management that will not result in any physical saving but, at the same time, entail financial economy (for instance, partial consumption of electricity at night when the tariff is cheaper).

22 What kind of risks exist by conclusion of energy service contracts. Какие существуют риски при заключении энергосервисных контрактов. – Available at: http://journal.esco.co.ua/2010_6/art254.htm.

23 When it comes to the fluctuation of prices on energy resources, the utility tariffs are more likely to grow than to decrease. It is advisable to set projected figures of the increase in energy prices and in the respective tariffs in the agreements.

in savings compared to payments based on estimated consumption. However, considering the increase in tariffs, the energy consumption problem is not resolved. This means that ESCO must offer mechanisms aimed at actual increase in energy efficiency of the buildings.

It is also always recommended to define in the agreement the terms of distribution of the funds, which were saved as a result of implementation of energy efficiency measures, between the customer and the contractor.

Regarding the validity term of the agreement, the agreement contain a clause that the obligations under the agreement shall be deemed completed and the agreement shall be deemed terminated before the stated expiration term once the price (value) of the project has been compensated.

In addition, some agreements stipulate conditions for transfer of energy efficient equipment purchased by ESCO to the customer. In particular, the customer may be given the right to buy out the equipment from ESCO after a certain period at the residual value.
III. ENERGY SERVICE CONTRACTS: BUSINESS MODELS
In today’s theory and practice, business contracts use various interpretations of the term *business model*. Below you can find some of them, as defined by modern economists:

- A business model is “the vision of how the organization makes (or intends to make) money. A business model describes value that the organization offers to its clients, reflects the organization’s capabilities, enumerates partners necessary for creation, promotion and supply of this value to the clients, its relations with the clients and the capital required to create a sustainable income flow.”

- “A business model is how a company selects its customers, formulates and delineates its offers, distributes its resources, decides what tasks it can perform using its own means and what tasks will require external specialists, how it enters the market, creates value for the customer and receives profit from it.”

- Business model is “includes 3 components: company proceeds drivers, strategy for pricing and monetization, strategy of sales and distribution.”

- “Company’s business model is the way in which the company creates value and obtains profit.”

Thus, ESC business models are based on a systematic and consistent implementation of a set of technical and technological measures resulting in energy cost savings. These savings are the most effective incentive to invest into energy saving measures. It is important that savings resulting from energy savings exceed the costs incurred in implementation of energy saving measures. Reductions in energy costs are not the only important factor in ECK business model. Other factors include, for example, increase in market value of real estate, increased comfort of modernized buildings as well as extension of their operation period.

General ESC business model is shown in Graph 2.

In many countries, the key in creating ESC business model is to define the funding sources. In most cases, energy service projects are funded by long-term loans. In particular, a greater part of energy services in developed economies is provided to the government, and ESCs are mainly funded by the customer. One of the main reasons for this approach is the fact that the loans for the government in these countries are usually less expensive than loans for ESCOs. This was the government/customer takes a loan to implement the project and an ESCO guarantees to repay the loan once the agreed-upon level of energy efficiency is achieved.

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26 Alex Osterwalder, Business Model Generation.
28 R. Haker, Billion Dollar Company.
29 H. Chesbrough, Open Business Models.
In some other countries, such as the US, the funding is provided by the ESCO. For competitive bids the US Government uses a special Memorandum on selection of the funding source for the project. Private lenders want to be sure that the borrower will be able to pay for ESCO’s services. Thus, even if ESCO assumes all credit risks, the US banks still evaluate the client’s financial solvency.

In the US, a typical energy service project must have several funding proposals. Financial companies usually make flexible offers with a structured payment schedule which corresponds to the project’s financial flows as closely as possible.

The Clinton Foundation's Climate Initiative (CCI), in cooperation with large real-estate companies and ESCOs, developed standardized EPC business models that allow building owners and ESCO to implement complex projects of modernization and energy efficiency improvement in the real estate sector. When these business models are selected, important attention is paid to the assessment obstacles for energy efficiency investments in commercial real estate. The use of these standardized business models in the US requires compliance with a number of additional requirements imposed by the US governmental agencies both on the energy service customers and on ESCOs.

In the US, energy service customers – facility owner or its representative – must meet the following requirements:

- Coordinate the requirements to bidders and develop relevant documentation;
- Issue request for proposals for implementation of the energy service project. The request should include qualification requirements to ESCOs, list of the services to be delivered by the bid winning ESCO, and the pricing methodology for the services to be delivered;
- Verify the bidders’ documents for compliance with the requirements;
- Select the ESCO that submitted the best proposal for the implementation of the energy service project. It must evaluate the quality of the proposals submitted by ESCOs and coordinate timeframes for proposed services;
- Enter into the most advantageous ESC with the selected ESCO. The ESC should include the measures to be implemented to increase energy efficiency at the facility, implementation guarantees, and provide for necessary compensation in case of termination of the agreement.

As a bidder, an ESCO must meet the following requirements:

- Financial and organizational ability to implement the ESC;
- Availability of necessary equipment for technical examination and energy audit of the facility;
- Ability to conduct comprehensive energy audit, develop key steps for facility’s energy efficiency improvement based on the audit’s results, and to discuss possible ways of their implementation with the facility owner. The measures should include the offer of services, energy engineering and the investment proposal;
- Ability to use additional technical measures and appropriate financial resources, if necessary, for unconditional implementation of the energy service project.

The Energy Service Contract between a customer and an ESCO may also include special conditions, such as specification of the term for contract signing, conditions for the parties’ participation in the investment capital, investment obligations of the parties in regard to reimbursement of costs and compensation for termination of the energy service agreement, etc.

These standardized business models can be useful to energy service projects in the public sector. These effective models for procurement of energy services are widely used in different countries around the world and may be adapted to Ukraine’s needs.

Recently, new super energy service performance contracts came into use in the US. They include pre-qualification of ESCOs. Procurement procedures for such contracts provide for a possibility to create an indefinite number of contracts within the total package of orders. These procedures are used for ESCs with the US federal agencies. This mechanism allows for a significant reduction in the time required for implementation of energy saving measures.

In Europe, the issue of credit worthiness under ESC is bigger than in the US. In the recent past, nearly all ESCs have been funded by third parties – banks or other financial institutions.

Based on their own experience, IFIs offer ESCOs several business models of funding for ESC and energy service projects.
3.1. Funding Models for Energy Service Contracts

3.1.1. ESC Direct Funding Model

This model (presented on Graph 3) offers implementation of energy efficiency improvement projects using credit resources from IFI provided as direct funding to ESCO. Implementation experience in the West proved this model to be the most favorable for implementation of the energy efficiency projects in public buildings.

Key stages of direct funding model:

- ESCO enters into one or more typical ESCs for energy efficiency improvement of public buildings;
- IFI issues a long-term loan to the ESCO;
- ESCO uses these resources to implement a package of energy efficiency measures for public buildings;
- The loan and interest are repaid by the ESCO from the savings resulting from reduced consumption of energy resources in public buildings within the term of the contract.

To receive funds via the direct funding model, an ESCO must be a large company/part of a large holding, able to provide a liquid collateral to obtain a loan.

This funding model is used in Ukraine but the recipients of a loan here are usually either an executive body of a local community acting on the grounds of a decision by the appropriate self-government bodies, or business entities (municipal companies for heating, water supply and drainage) against properly executed municipal guarantees.

3.1.2. ESC Funding: Specialized Fund

The model of ESC funding through a specialized fund (presented in Graph 4) is based on the use of IFI funds, as well as funds of regional and/or municipal budgets. In addition, interested commercial banks and private companies can participate as well.

In this model, a specialized fund is created to ensure that short-term loans taken from commercial banks for energy saving measures under EPC are repaid. It is important that regional authorities and/or local self-government bodies participate in the establishment of this fund. Contribution of budget funds to the charter capital of this fund confirms the commitment of national and local government to support development of the energy service business.

The fund may take the form of an open joint-stock company (OJSC). In addition to the state authorities, local self-government bodies and IFIs, commercial banks and private businesses can participate in the creation of this fund. Once the fund is up and running, IFIs may act as its creditors.

Graph 3. Implementation of energy saving measures with direct ESCO funding

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35 In Ukraine, its analog at the moment is public joint-stock company.
Main stages of Specialized Fund Funding Model for ESCO:

1. ESCO enters into one or several typical ESCs for energy efficiency improvement of public facilities.
2. ESCO receives a short-term loan from a commercial bank for implementation of energy saving measures in public facilities.
3. The fund's resources are used to buy out the right to claim the proceeds from the saving received by ESCO through EPC implementation.
4. The amount paid by the fund to ESCO offsets the costs (bank loan) and provides ESCO with the appropriate income. This allows ESCO to repay its short-term loan to the commercial bank.
5. The fund undertakes long-term risks as part of EPC and becomes the legal successor to the funds resulting from the created savings.
6. If the savings obtained due to reduction in resource consumption are less than the level projected in EPC, ESCO must reimburse the fund this difference at its own expense.
7. Annual proceeds from savings can be used by the fund to pay dividends to the fund's founders or to repay loans taken from IFIs, commercial banks or other financial institutions.

Main requirements to the specialized fund model:

- ESCO must be able to implement energy efficiency projects for public facilities;
- ESCO must be able to act as a potential borrower under a short-term loan;
- Regional authorities and/or local self-government bodies must participate in the establishment of the specialized fund.

At the moment, Ukraine does not have any experience of funding energy efficiency programs through a specialized fund. However, use of this mechanism is highly relevant. The State Agency for Energy Efficiency and Energy Saving has prepared appropriate draft administrative acts of the Cabinet of Ministers of Ukraine aimed at creating the
3.1.3. ESC funding through a line of credit

ESC funding model through a line of credit (Graph 5) requires presence in the region of commercial banks willing to participate in new financial products and to share the risks of financing energy service products with IFIs.

In this model of ESC funding an IFI establishes a line of credit for commercial banks interested in long-term financing for energy service projects.

Main stages of implementation for ESC line-of-credit funding:

1. ESCOs sign energy service contracts for energy efficiency improvement of public buildings.
2. IFIs provide lines of credit to local commercial banks.
3. Local commercial banks provide financing to ESCOs using the lines of credit from IFIs.
4. ESCOs implement measures to improve energy efficiency of public facilities using the long-term loans received from the commercial banks.
5. ESCOs repay the loans and interest from the savings from the reduced energy consumption during the term of the contract.
6. Commercial banks use the funds received from ESCOs under the energy service contracts to repay the long-term loans (open line of credit) issued by the IFIs.

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It should be noted that an IFI as a rule will consider opening a line of credit for a commercial bank only if the ESC applying for funding is large enough.

In Ukraine, energy efficiency projects have been funded through the line of credit by the European Bank for Reconstruction and Development (EBRD) within the framework of the loan agreement via PrJSC UkrESCO and within the framework of the Ukrainian Energy Efficiency Improvement Program (UKEEP) implemented with participation of three Ukrainian banks.
IV. MODELS OF ENERGY PERFORMANCE CONTRACTS
Analysis of ESCOs in developed economies demonstrates that the ESCs in use have different models and differ by the following characteristics:

1. Types of services rendered to the customers:
   - Individual services (consulting, project development, equipment supply, development of energy efficiency improvement measures, etc.);
   - Comprehensive services (turnkey project development and implementation).

2. Funding sources for energy efficiency improvement:
   - Funds of the facility owner or its representative (customer);
   - ESCO funds;
   - Funds of creditors/financial institutions.

3. Account settlement procedures between the owner and ESCO:
   - One-time payment;
   - Payment in stages during project implementation;
   - Payment upon completion of the project, on agreed-upon date.

4. Ownership right to the equipment installed at the stage of the project implementation:
   - Belongs to the owner;
   - Belongs to ESCO.

5. Distribution of proceeds from the savings obtained in project implementation between ESCO and the owner of the facility.

Thus, ESCOs can provide both individual services for implementation of energy service projects (consulting, design, energy service equipment, etc.), and comprehensive services (“turnkey”). Depending on the nature of the services rendered by the ESCO, different forms of ESC are applied, including energy performance contracts (EPC).

4.1. Models of energy performance contracts

Analysis of EPC in developed countries defined the most commonly used models:

- GSC (Guaranteed Savings Contract);
- SSC (Shared Savings Contract);
- FOC (First Out Contract);
- Chauffage Contract;
- Full Management Contract.

4.1.1. GSC (Guaranteed Savings Contract)

This EPC model is a contract, under which ESCO guarantees reduction of energy consumption (in physical terms) up to a certain level, which is not obligatorily tied to indicating specific savings in money terms.

In this model (Graph 6), projects as a rule are funded by the customers, including the use of borrowed funds. ESCO releases the customer from technical risks and undertakes all technical risks connected with the development and implementation of the project but does not undertake the credit risk of loan repayment.

The customer repays the loan from the savings achieved through implementation of the project and bears the investment risk. If the actual savings are lower than the level guaranteed by the ESCO and are insufficient to repay the loan, the ESCO must compensate the difference. The customer pays for the ESCO’s services (as a part of the...

IV. MODELS OF ENERGY PERFORMANCE CONTRACTS

project implementation) until the guaranteed level of savings is reached.\textsuperscript{39, 40} Also, additional payment is possible for the purpose of verification of annual savings and maintenance of the equipment.\textsuperscript{41}

The contract can have a clause on savings exceeding the guaranteed level, indicating the share of such savings that the customer must pay to the ESCO.\textsuperscript{42}

As a rule, the contract should contain a clause that the ESCO guarantees a certain level of energy savings that will be sufficient for the customer to fulfill its debt obligations provided that energy prices will not fall lower than a certain set minimum price.\textsuperscript{43} In such contracts, the loan is repaid out of the savings achieved while the schedule of payments depends on the level of savings: The bigger the savings, the sooner the loan is repaid. The model of guaranteed savings will most likely function properly in the countries with a well-developed banking structure, a high level of understanding of project funding and sufficient technical expertise to understand energy efficiency projects (for instance, Great Britain, Austria, Hungary, etc.) It is difficult to use guarantees savings model in developing markets because it requires from the customers (consumers) to undertake investment risks.\textsuperscript{44, 45}

Contracts in this model clearly describe methods of energy efficiency measuring and control. Customers' understanding of the part of savings that the customer receives due to the ESCO activities is a critical factor in building the client's trust in energy service and funding of energy service projects. The international protocol for measuring and verification of energy savings (International Performance Measurement and Verification Protocol – IPMVP)\textsuperscript{46} helps to define energy savings level in a coordinated and reliable fashion. This protocol is the most common international standard for measurements and verifications.

The typical structure of contractual relations for Guaranteed Savings Contracts (GSC) is shown in Graph 6.\textsuperscript{47}

4.1.2. SSC (Shared Savings Contract)

This EPC model implies a contract under which an ESCO guarantees the customer a reduction of monetary expenses for energy consumption/utility services to a certain level.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{graph6.png}
\caption{Typical structure of contractual relations for Guaranteed Savings Contracts (GSC)}
\end{figure}

\begin{itemize}
\item 43 Paolo Bertoldi, Silvia Rezessy, Status Report 2005.
\item 45 Paolo Bertoldi, Silvia Rezessy, Status Report 2005.
\end{itemize}
In this model (shown in Graph 7), an ESCO accepts all risks connected with achievement of the stated levels of savings, including both the risks connected with the design and implementation of projects and the crediting risk and, thus, ensures funding of the project.

In this case, the revenues from the savings received from energy efficiency measures at the customer’s facility are distributed within a defined period of time in a ratio set by the terms and conditions of the agreement. A typical distribution of the future monetary savings may be 85% for ESCO and 15% for the customer. ESCO can define a payment system, under which it can receive a larger share at the beginning of the project implementation through initial investments, for example. After a certain period of time, however, its share may be reduced depending on the term of the agreement and interest rates that will be actually applied within the term of the project implementation.

Another feature of this EPC model is that the ownership right to the equipment installed will be transferred to the customer upon expiration of the term of the contract.

Interest rates under this model are too high for small and medium-sized ESCOs; this means that EPCs of this type are mainly concluded with large ESCOs. As a rule, such contracts have short payback periods.

The purpose of such EPCs is to ensure compensation of all expenses borne by the ESCO and to obtain planned income within the project implementation period. In this case, the customer does not invest into the project but receives its share of savings within the set period of the project implementation and full level of savings upon its completion. If the customer withdraws from the project the income flow stops, which puts the ESCO into a difficult situation.

As a rule, these contracts include provisions on how the project performance will be measured and controlled. A typical structure of contractual relations under the Shared Savings Contract (SSC) is shown in Graph 7.

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Graph 7. Typical model of contractual relations under a Shared Savings Contract (SSC)

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52 Paolo Bertoldi, Silvia Rezessy, Status Report 2005, p. 16.
Table 1 provides a brief comparison of Guaranteed Savings Contracts and Shared Savings Contracts.  

<table>
<thead>
<tr>
<th>GUARANTEED SAVINGS CONTRACT</th>
<th>SHARED SAVINGS CONTRACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity is tied to and valued by the level of energy saved (in physical terms)</td>
<td>Productivity is tied to and valued by the level of energy saved (in monetary terms); ESCO accounts are based on the actual money savings</td>
</tr>
<tr>
<td>Detailed measurements and verification of the economy of resources</td>
<td>ESCO payments are tied to the price for energy resources</td>
</tr>
<tr>
<td>The level of savings is guaranteed for the full coverage of the debt obligations (loan repayment) with the minimum fixed energy resource price</td>
<td>ESCO bears all technical risks of the project implementation</td>
</tr>
<tr>
<td>ESCO bears all technical risks of the project implementation</td>
<td>ESCO bears all risks of the project implementation including the credit risk as it ensures funding of the project</td>
</tr>
<tr>
<td>The customer of energy resources/customer bears the credit risk</td>
<td>Usually, financial liabilities are outside the balance-sheet account of the consumer of energy resources/customer</td>
</tr>
<tr>
<td>If the consumer of energy resources/customer takes out a loan, the debt appears on its balance-sheet account</td>
<td>The customer must be solvent</td>
</tr>
<tr>
<td>Both small and medium ESCOs may implement projects without the need to borrow funds with high interest rates</td>
<td>ESCO can service the customers that do not have access to funding</td>
</tr>
<tr>
<td>EPC may have a broad nature and a longer payback period (up to 15 years)</td>
<td>The project includes measures with short payback period (to 5 years)</td>
</tr>
<tr>
<td>Typical for well-developed economies with robust banking systems</td>
<td>Typical for developing economies with underdeveloped banking systems</td>
</tr>
</tbody>
</table>

4.1.3. First Out Contract

This EPC model is a variation of the Shared Savings Contract. In this EPC, however, **100 percent of the income received from implementation of the project is retained by ESCO until the full repayment of the investments** (including settlements under the credits, loans or other forms of funding) and receipt of the projected level of profitability: the higher the savings, the shorter the payback period and the shorter the project implementation period.  

4.1.4. Chauffage Contract

This EPC model is used in many European countries but it is most common in France (where it got its name). These contracts are similar to Contract Energy Management (CEM) that are common in Great Britain, and Energy Supply Contracting (ESC) that are common in Germany.  

Chauffage Contract is a contract where the energy resource supplier acts as an ESCO. In this case, the ESCO ensures optimal operation of the existing system and the agreed level of comfort (air temperature, humidity, etc.) at a lower cost for the consumer. The ESCO can increase its income by investing into energy efficient equipment or by reducing the production cost of an energy resource, whereby reducing its own costs. In France, these agreements are usually long-term and include obligations on identification of problems and improvement of the system via relevant investments.  

The Customer and ESCO agree on supply of the energy resource (heat, industrial steam, electricity for lighting, fuel, etc.) at a fixed price (or at the price that may be changed within the contract duration in accordance with procedure fixed in the contract) for a longer period that may span ten or even thirty years. Also, ESCO offers to the customer energy saving measures that would allow to reduce energy resource consumption. Under this form of contract, energy saving measures are funded by ESCO as it remains the owner of energy service equipment. Under a long-term contract, ESCO expects an increase in income and, therefore, is interested in implementation of energy efficiency measures and reduction of the production costs for the energy resource. In addition, as ESCO provides additional services to its consumers it can receive a competitive advantage and redirect the released investments.  

56 Agency for Environmental Protection and Efficient Use of Energy. – Available at: http://www2.ademe.fr/servlet/getDoc?id=38480&m=3&cid=96.  
58 The term of the contract is a period between approval of the contract and its closure. Within this period, ESCO is obligated to ensure efficiency of the project including proper operation and technical maintenance. In addition, ESCO checks the measures for the real savings achieved during the term of the contract. As a rule, ESC is entered into for the 10-year implementation period, although ESCs concluded for shorter periods (5 years) become more popular in the European countries (Jas Singh “Public Procurement of Energy Efficiency Services”).
capacity for production of additional energy resources for new consumers. The customer receives an opportunity to reduce consumption of energy resources and cut the costs for the purchase of those resources.

Contracts based on this model are used in Europe mainly because heat energy in European countries is a competitive sector where it is possible to choose the energy resource supplier and negotiate the price for it. Within the framework of these contracts, public authorities often involve third parties for financing of services at public facilities.

From this viewpoint, the Chauffage Contract, the Contract Energy Management and the Energy Supply Contracting applied in the public sector may be viewed as Public Private Partnership contracts.69

Use of EPCs under the Chauffage Contract model in Ukraine is difficult at present. This is primarily due to the fact that the producers and suppliers of energy resources in Ukraine are natural monopolies regulated by the state. Ukrainian consumers have limited possibilities to choose suppliers of heat, electricity, water or gas. The tariffs of the housing and utility companies are also regulated by dedicated state authorities and, therefore, the price for energy resources is not a subject of agreement between the supplier and the consumer. Regulated tariffs lower the motivation of energy resource producers to reduce costs and, while, at the same time, they are interested in selling as much energy as possible. This means that energy producers are not interested in offering the consumers to implement energy saving measures.

4.1.5. Full Management Contract

Recently, in developed countries, especially in the US and Germany, the EPCs for property management, and property management obligations are combined with those of energy efficiency improvement (Full Management Contract).60 As a rule, these contracts deal with management of different buildings and contain two groups of obligations:

- Ensuring proper maintenance of buildings;
- Ensuring comfortable conditions in the buildings.

The first group of obligations relates to planning and performance of the building’s maintenance, including maintenance of equipment and structural elements, sanitary maintenance and oversight of adjacent areas.

The second group of obligations includes utility services: energy supply, water supply and sewerage, heating, etc.

To fulfill its obligations, ESCO receives appropriate funding from the customer according to the agreement and outsources building maintenance to various contractors and signs agreements with organizations that supply energy resources.

The Full Management Contract includes an important requirement: to increase energy efficiency in the building to agreed-upon levels. This allows such contracts to be viewed as energy service contracts.

Depending on the structure of contractual relations between the customer, ESCO and the company that provides resources, there are two types of full management EPCs.

4.1.5.1. Energy Performance Contract: Full Management Contract, Type 1

In this EPC model (shown in Graph 8) the customer enters into a contract with ESCO for energy efficiency improvement of the building to the agreed-upon level through a number of resource saving and energy efficiency measures. The payment for these works is made using the difference between the volumes of energy consumed as of the date of entry into the contract and the energy resources that are consumed upon implementation of energy efficiency measures. Under this model, ESCO is not responsible for the general condition of the building, and the contract with an energy supplying company (for instance, heat supplier) is entered into by the customer.

Under the Full Management Contract, Type 1, energy efficiency improvement is funded by the customer. Full Management Contract, Type 1 is somewhat similar to the Guaranteed Savings Contract.

4.1.5.2. Energy Performance Contract: Full Management Contract, Type 2

In this EPC model (shown in Graph 9) ESCO enters into a contract with the customer to ensure comfortable conditions in the building and fulfills certain obligations to improve energy efficiency. Under this model, the customer enters into the contract with ESCO, and ESCO acts as a managing organization/company and enters into contracts with energy supplying companies that provide resources and services.

Payments under the contract between ESCO and the customer are made on the basis of the fixed volume of energy resources consumed as of the moment of execution of the contract. Payments under the contract between ESCO and resource supplying organization are based on the levels of energy resources actually consumed. The difference in the cost of the fixed and actual consumption of energy resources is ESCO’s profit used for implementation of energy saving measures, repayment of borrowed funds and generation of its own income.

Under the Full Management Contract, Type 2, energy efficiency improvement is funded by ESCO (managing company). In this model, the costs for energy resources are fixed and included into the contract. This means that energy efficiency improvement is paid for under the agreement due to the fact the ESCO (the managing company) reduces expenses for energy resources once energy efficiency is improved. The distribution of savings in this contract is similar to EPC.
Full Management EPCs have the following general characteristics:

1. ESCOs are responsible for development, implementation, and evaluation of energy efficiency project results.
2. ESCOs undertake the risks of the project implementation and guarantee reduction in the energy cost for the customer (building owner or its representative).
3. ESCOs offer a wide range of recommendations to the customer and assist in development of energy efficiency improvement measures aimed to satisfy the needs of each individual customer.

Certainly, a managing company may involve other ESCOs into energy efficiency improvement works based on the works contract, as it undertakes energy saving obligations and performance risks under the contract. Therefore, this managing company may be referred to as energy service company.

It should be pointed out that Full Management Contract allows to achieve more tangible and sustainable results in energy efficiency improvement compared to other forms of contracts. This is due to the following:

- Under Full Management Contracts energy efficiency is improved not only through implementation of technical solutions and use of new equipment and materials, but also through optimization of building operation mode. In educational facilities, for example, temperature can be reduced at night and during weekends.
- Implementation of energy saving measures can reduce maintenance costs for a building. This can include use of automation devices, new materials, etc. This reduces the project’s payback period, and provides a possibility to implement additional energy efficiency measures.
- Responsibility for the building maintenance guarantees replication of the increase in energy efficiency because the contractor is fully responsible for the final results, including comfortable conditions and energy saving. Also, the contractor is in full control of all aspects of the building operation.

Full Management EPC can also promote a competitive environment in a city/municipality. It is common to create ESCOs at the municipal level. These ESCOs take loans from a financial organization against the guarantees of the local budget to perform Full Management EPC in the municipal sector.

The typical structure of contractual relations with municipalities under Full Management EPC is shown in Graph 10.

Full Management EPCs have certain prospects in Ukraine. It is especially important to apply them on national and municipal levels. This will allow to solve the issue of professional management of buildings and energy saving measures.

Similarly, Full Management EPCs also have good prospects in the residential sector. A number of companies managing multi-family buildings are currently interested in implementation of such contracts and consider them as their competitive advantage.
V. FUNDING FOR ENERGY SERVICE CONTRACTS
As mentioned above, *performance contracting* is one of implementation mechanisms for energy saving projects. The concept of such contracts is directly tied to energy savings indicators.

Funding for energy saving projects for ESC implementation can come from the following sources:

- ESCO’s own funds;
- Customer’s own funds including targeted allocations from the budget;
- Borrowed/credit funds from financial institutions;
- Private investments from third parties.\(^6\)

### 5.1. International funding sources

Ukrainian budget legislation contains special provisions about using loans from international financial organizations.

According to Article 16 of the Budget Code, credits (loans) from foreign states, banks and international financial organizations for implementation of investment programs (projects) are used by the state on the basis of international agreements, to which Ukraine is a party, and constitute the governmental external borrowings.\(^62\)

The funds for implementation of such investment programs (projects), as well as the costs of servicing and repayment of relevant credits (loans) are provided for in the *Law On the State Budget of Ukraine* for the entire term of the loan agreements. Relevant international agreements do not need to be ratified, unless otherwise established by law. All investment programs and projects, as well as the funds obtained for them, are implemented in accordance with the loan agreements between foreign lenders and the state of Ukraine.\(^63\)

Concerning the local borrowings that are relevant and realistic for ESC, local external borrowings may be only performed by the Supreme Council of the Autonomous Republic of Crimea, city councils of Kyiv and Sevastopol, as well as city councils of cities of regional status. External borrowings on the local level may be taken in the form of credits (loans) from international financial organizations by all city councils.\(^64\)

City councils that receive such loans must sign loan agreements with international financial organizations.

In accordance with the budget legislation, the Ministry of Finance of Ukraine must approve volumes and terms of local borrowings and provision of local guarantees. An important legislative development is Part 2 of Article 74, Budget Code of Ukraine, which stipulates that if the Ministry of Finance of Ukraine fails to make a decision within one month of the receipt of documents submitted for approval, the volumes and terms of local borrowings in the form of credits (loans) from international financial organizations and provision of local guarantees to ensure full or partial discharge of the obligations of businesses that arise with regard to the credits (loans) from international financial organizations, are deemed approved.\(^65\) The goal of this provision is to simplify the procedure of providing local guarantees and taking loans from international financial organizations.

It should be noted that the Budget Code states that the State Budgets cannot be used to discharge any liabilities under borrowings taken by local budgets. Local debts are serviced by the general fund of the budget and may not exceed 10% of the annual expenditures of the general fund of the appropriate local budget during any budget period when servicing of the debt is planned. If the borrower breaches the agreement reached with the creditor regarding the schedule of repayment of the local debt and its servicing, such local council may not make any new local borrowings for the next 5 years.\(^66\)

Presently, the Local Borrowing Procedure is approved in accordance with the terms and conditions set by the Budget Code and the Resolution of the Cabinet of Ministers of Ukraine dated 16 February 2011 No. 110.\(^67\)

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\(^64\) See Article 16 of the Budget Code of Ukraine of 08.07.2010 No. 2456-VII Verkhovna Rada of Ukraine. – Available at: http://zakon2.rada.gov.ua/laws/show/2456-17.


It is important to mention that under Ukrainian legislation, publicly funded institutions are not entitled to borrow funds in any form (except in cases provided for in the Budget Code) or issue loans from the budget to legal entities or individuals (unless there are relevant budget allotments for loans from the budget).\(^6\)

Budget legislation does not regulate provision of loans to privately owned legal entities. These legal relations are regulated by contracts entered into by the parties in compliance with Ukrainian legislation.

Key financial institutions, organizations, and funds that provide loans and funding for energy saving projects in Ukraine are:

- World Bank (WB);
- European Bank for Reconstruction and Development (EBRD);
- Nordic Environmental Finance Corporation (NEFCO);
- Eastern Europe Energy Efficiency and Environmental Partnership (E5P);
- United States Agency for International Development (USAID);
- German Society for International Cooperation (GIZ);
- Swedish International Development Agency (SIDA).

### a) World Bank (WB)

According to the data of World Bank,\(^7\) the Ukrainian sector of municipal services suffers from insufficient investments and improper maintenance for several decades. Ukrainian energy efficiency level is among the lowest in the region. To resolve this problem in the way that will ensure sustainable energy savings, the World Bank provides financial support using the line of credit of USD 200 million (Project of Energy Efficiency Improvement in Ukraine\(^8\) approved by the World Bank Board of Directors in May 2011). The Project ensures access for industrial and municipal companies to the long-term funding primarily for projects that offer commercially viable investments for energy efficiency improvement.\(^9\)

In addition to the above, the World Bank is also working on an energy efficiency project for district heating aimed to reduce losses and improve efficiency of six providers of centralized heat supply in different regions of Ukraine.\(^7\)

In November 2014, the World Bank launched a technical assistance project City Energy Efficiency Transformation Initiative (CEETI) – Ukraine in Kyiv, Ternopil and Kamianets-Podilsky. The Project will be implemented in Ukraine with the support of City Energy Efficiency Transformation Initiative of the Energy Sector Management Assistance Program (ESMAP). The Project will assist three cities in development of local capabilities necessary for preparation and implementation of investments into municipal services, infrastructure and buildings aimed at transformational energy efficiency improvement.

The key activity areas include assistance to the selected cities in:

- Efficient planning and implementation of investment programs on energy efficiency improvement in various areas of the housing and utility sector;
- Identification and development of profitable municipal energy efficiency projects and facilitation of their funding;
- Development of financial mechanisms for replication and scaling of pilot municipal investment projects in the energy efficiency area;
- Propagation of best practices and experiences in cities throughout Ukraine.
As part of the Project, a group of specialists of the International Bank for Reconstruction and Development will present the project implementation plan and familiarize the cities with the tool for fast evaluation of the municipal energy sector (TRACE) that will be used in the first three cities.74

b) European Bank for Reconstruction and Development (EBRD)

EBRD is the largest financial investor in Ukraine. As of 31 March 2015, the bank has taken an obligation to provide EUR 10.4 billion through 34 projects in Ukraine.75

EBRD strategy for Ukraine states that taking into consideration rising prices on energy resources and the low energy efficiency level in the country, EBRD is intensifying its energy efficiency initiatives in all sectors of the economy. This will be achieved both through direct lending to corporate structures, electric power facilities and infrastructure, and through increased loan volumes via third parties as part of the lines of credit opened for industrial energy efficiency improvement. In addition, new lines of credit will be developed for energy efficiency improvement in the housing sector.76

Since 2007, EBRD has been implementing the Ukraine Energy Efficiency Program (UKEEP). This is a line of credit for Ukrainian private companies from any sector of the economy willing to invest into energy efficiency or development of renewable energy sources – the investments resulting in reduced energy consumption, growing production of own energy resources or more efficient use of such resources. UKEEP provides free technical assistance of international experts in the area of energy efficiency to the companies that prepared projects in compliance with the UKEEP funding conditions (Graph 11).

If a project appears feasible, UKEEP makes it possible to take a loan for its implementation.77

The UKEEP line of credit is available through intermediary banks, which, in fact, issue loans to Ukrainian private companies that applied for UKEEP’s funding. At the moment, UKEEP has three partner banks: Raiffeisen Bank Aval, UkrExImBank and MegaBank.

The key advantage of UKEEP is independent technical consulting support provided by international and local experts and funded by the Austrian Federal Ministry of Finance.

At the end of February 2015, EBRD also announced the launch of a new line of credit of USD 100 million within the framework of the project Technical Assistance for Improvement of Energy Characteristics of Residential Buildings. The funds allocated by EBRD will fund energy efficiency improvement in residential buildings.78

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75 Ukraine and the EBRD. – Available at: http://www.ebrd.com/ukraine.html.
77 Ukraine Energy Efficiency Program. – Available at: http://www.ukeep.org/ru/.
78 Держенергоэффективности підтримує ініціативу ЄБРР щодо започаткування нової кредитної лінії вартістю 100 млн. доларів США на термодеревнізацію будівель. – Available at: http://www.kmu.gov.ua/control/uk/publish/article?art_id=247975719&cat_id=244276429.
c) Eastern Europe Energy Efficiency and Environmental Partnership (E5P)

The Eastern Europe Energy Efficiency and Environmental Partnership (E5P) or the so-called “Swedish Initiative” was created by international donors for the purposes of joint funding of investments into the utility sector of Ukraine and into the countries of the Eastern Partnership with a special emphasis on the energy efficiency improvement aspects.

The Fund’s participants contributing to E5P are Denmark, Estonia, the European Union, Finland, Iceland, Latvia, Lithuania, Norway, Poland, Sweden, Ukraine and the US.79

The funds from E5P are issued in addition to energy efficiency loans allocated by international financial organizations including the European Bank for Reconstruction and Development, the European Investment Bank, the Nordic Investment Bank, the Nordic Environmental Finance Corporation and the World Bank Group.80

In 2014, the Eastern Europe Energy Efficiency and Environmental Partnership announced that it would allocate up to EUR 200 million to Ukraine for modernization of the municipal sector’s energy efficiency. The grant component will be about EUR 40 million and, based on the 1:5 ratio of grants and loans, the total investment funds to come into the municipal sector of Ukraine will total at EUR 200 million. In total, it was planned to implement 16 projects in different Ukrainian cities in 2014, of which 15 are investment projects and one is a technical assistance project.81

As of November 2014, the Fund’s portfolio in Ukraine included 17 projects for restoration and modernization of the water supply and heating systems for the municipal companies for the total estimated value of EUR 295 million, of which IFI loans amount to UAH 175.54 million, and E5P technical assistance grants – UAH 62.35 million.82

d) Nordic Environmental Finance Corporation (NEFCO)

NEFCO is an international financial organization founded by five North European countries (Norway, Iceland, Denmark, Sweden and Finland) in 1990. The Corporation supports green growth investments and funds projects that are implemented mainly in Russia, Ukraine and Belarus, as well as the climatic problem resolution all over the world. The main goal is to achieve environmental effect for the benefit of the North European region.83

NEFCO has been working in Ukraine since 2004. The Framework Agreement with NEFCO was ratified by the Verkhovna Rada of Ukraine in 2010.84

Direct foreign investments use different models of public and private cooperation, as well as municipal structures.

Preferential loans are issued to enterprises and companies of all forms of ownership including municipal entities that implement the projects complying with the top-priority areas of environmental improvement.85

Since 1996, NEFCO has been implementing a special lending program Clean Production Program aimed at reduction of industrial pollution through efficient use of energy resources and raw materials, discontinuing the use of hazardous materials, reduction in frequency and volumes of toxic emissions, release of liquid and solid waste from the production processes.

The program is intended to fund investment projects for modernization of production that allow achieving both environmental and economic effect. Under the Clean Production Program, NEFCO issues loans to private and state-owned companies. In general, clean production is achieved through modernization or reconstruction of existing companies and facilities that have a positive effect on the environment due to use of progressive technological solutions.

Repayment of the loan is directly tied to the savings achieved through the investment. The Program provides small loans (up to EUR 500,000) to Ukrainian companies against 6% per annum in Euros. The maximum period of loan repayment is 5 years. The security is 125% to 200% of the loan. Each own contribution should be at least 10%.86

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82 Уряд працює над підвищення енергоефективності // Міністерство економічного розвитку і торгівлі України. – Available at: http://zakon2.rada.gov.ua/laws/show/994_999.
83 Ще про НЕФКО // Nordic Environment Finance Corporation. – Available at: http://www.nefco.org/ru/eshche_o_nefko.
84 Programme “Cleaner Production Credits”// Nordic Environment Finance Corporation. – Available at: http://www.nefco.org/financing/cleaner_production_credits.
The NEFCO Energy Saving Program was exclusively designed for projects in municipal buildings (kindergartens, schools, sports facilities, street lighting). The maximum amount of the credits issued by this Program is equivalent to EUR 400,000 in local currency.\

In addition, NEFCO and the Ministry of Regional Development, Construction and the Housing and Utility Sector of Ukraine supported by Sweden and ESP have developed and are implementing the Financial Program – DemoUkrainaDH. The Program’s goal is to demonstrate new technologies and modern solutions to Ukrainian cities that may be applied for district heating systems together with the use of international practices of project development, design, procurement, project implementation and performance control of the energy efficient heating services.

Since the beginning of 2012, ten project partners have been selected for implementation of demonstration projects in Ukrainian cities (Ivano-Frankivsk, Kamyanets-Podilskyi, Poltava, Donetsk, Bila Tserkva, Vinnytsia, Kryvyi Rih, Oleksandriya in Kirovohrad Oblast, Severodonetsk in Luhansk Oblast and Kyiv). For development and implementation of the projects, the partners received loans, grants and technical assistance.

At the moment, the next stage of the project DemoUkrainaDH-2 has started – total program value: UAH 10 million – with the goals similar to those of the previous stage. At the same time, due to an insufficient number of project partners, the Ministry of Regional Development, Construction and the Housing and Utility Sector of Ukraine (MinRegion) jointly with the Nordic Environmental Finance Corporation (NEFCO) announced continuation of the second round of the competition for implementation of demonstration projects in Ukrainian cities as part of DemoUkrainaDH.

Any municipal heating suppliers of Ukraine can participate in the Program except current partners of the Program. For the purposes of the project implementation, selected partners receive financial support in the form of grants, loans or technical assistance.

e) United States Agency for International Development (USAID)

USAID (United States Agency for International Development) is an independent agency of the US Federal Government in charge of the US non-military aid to other countries. USAID mission in Ukraine is to provide assistance in the process of the country’s transition to democracy and market economy, support of the measures to reduce negative consequences of the transitional period for the most vulnerable categories of the population.

In cooperation with the Ministry of Regional Development, Construction and the Housing and Utility Sector, USAID implemented the Municipal Heating Reform Project in Ukraine in 2009 – 2013. The USAID Project provided support to the Government of Ukraine in the improvement of the regulatory framework for implementation of necessary reforms in the heating supply sector. In its cooperation with 25 partner cities, the Project analyzed the condition of the municipal heating systems, assisted in the development of the municipal energy plans, the regulatory framework and technical specifications for metering equipment, implementation of energy efficiency demonstration projects in the heating and utility sectors.

In total, the USAID Project helped the cities to attract USD 175 million of public and private funds for energy efficiency projects during the 4 years of its activities in Ukraine including funding from international financial organizations, the State Budget and municipal budgets, commercial banks and private partners.

Currently, USAID is implementing the Municipal Energy Reform Project in Ukraine.

The budget of the four-year project (27 September 2013 – 29 September 2017) aimed at improving energy security in 17 Ukrainian cities using funds from international financial organizations and private investors will amount to $ 13.5 million. In Ukraine, the project is being implemented by International Resources Group, a US Company –, as well as its international and local partners.

The USAID Project Municipal Energy Reform in Ukraine is designed to reduce greenhouse gas emissions and improve energy security of Ukraine through improvement of the energy policy, enhancement of energy efficiency and attraction of private investments into the energy sector. Within the framework of the Project, 17 Ukrainian cities will

87 Programme “Energy Saving Credits” // Nordic Environment Finance Corporation. – Available at: http://www.nefco.org/financing/energy_saving_credits.
90 Who we are // United States Agency for International Development (USAID). – Available at: http://www.usaid.gov/who-we-are.
receive technical assistance for development of Sustainable Energy Action Plans (SEAP). Most of these cities have signed the covenant and undertaken to reduce CO₂ emission by 20% by 2020, as well as to replace natural gas with alternative and renewable energy sources.\textsuperscript{92}

\textbf{f) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH}

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is a federal institution that supports the German Government in the achievement of its goals in the area of international cooperation for sustainable development.\textsuperscript{93} The company works in more than 130 countries worldwide and has its staff 16 410 employees (around 70 per cent are local workforce).

Since 1993, GIZ has been supporting reforms in Ukraine by providing advisory and consulting services and organization of training and educational activities. A greater part of its activities in Ukraine is performed on behalf of the German Federal Ministry for Economic Cooperation and Development.

The legal basis of GIZ activities in Ukraine is determined by the terms and conditions of the framework agreement concluded by the Governments of Ukraine and Germany in 1996. Representatives of both Governments regularly meet to set top-priority cooperation areas and activities for mutual development. Today, the priority areas are as follows:

- democracy, civil society and public administration, decentralisation
- energy
- sustainable economic development\textsuperscript{94}

At the beginning of 2014 implementation of the Project "Establishment of Energy Agencies in Ukraine" started, which is a part of the International Climate Initiative of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany. The Project's beneficiary is the Ministry of Regional Development, Construction and Housing and Communal Services of Ukraine.\textsuperscript{95}

The main goal of the Project is through the establishment and consulting support of energy agencies to population and other clients, to explore potentials for energy savings, to increase energy efficiency, and therefore to decrease emission of greenhouse gases. Best practices will be presented to other municipalities and regions of Ukraine. At the same time consulting and networking activities at national level will create necessary legal framework conditions for facilitation of energy agencies establishment and implementation of energy efficient measures.

\textbf{g) Swedish International Development Agency (SIDA)}

Swedish International Development Agency is a governmental institution operating on behalf of the Swedish Parliament and Government. The Agency's main mission is to reduce poverty in the world.

Key activity areas of Sweden in Ukraine:

- Development of democratic governance and protection of human rights;
- Natural resources and the environment;
- Market development.

The Government of Sweden supports a number of initiatives and programs in Ukraine that are aimed at increasing the capabilities for management and resolution of ecological problems in compliance with European standards. In addition, it supports the initiatives for extension of centralized heat supply networks, waste water treatment, disposal of waste and introduction of energy saving technologies.

\textsuperscript{93} Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). – Available at: http://www.giz.de/en/aboutgiz/profile.html.
\textsuperscript{94} Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). – Available at: http://www.giz.de/ukraine.html.
\textsuperscript{95} Project “Establishment of Energy Agencies in Ukraine”. – Available at: http://eesau.org.ua/en.
5.2. National sources. Local programs for funding of energy efficiency measures

a) Targeted state-level economic program of energy efficiency and development of renewable energy sources and alternative fuels for 2010 – 2015

On 1 March 2010, the Cabinet of Ministers approved the Targeted state economic program of energy efficiency and development of renewable energy sources and alternative fuels for 2010-2015 (the Energy Efficiency Program). The goal of the Energy Efficiency Program are below:

- Create conditions for bringing the level of energy intensity of Ukraine’s GDP to these of developed countries and EU standards;
- Reduce the level of GDP energy intensity within the duration of the Energy Efficiency Program by 20% compared to 2008 levels (by 3.3 percent per year);
- Improve efficient use of fuel and energy resources and increase the competitiveness of the national economy.

One of the key tasks of the Energy Efficiency Program is to reduce technological costs and non-manufacturing losses of energy resources through modernization of equipment, introduction of energy efficient technologies, improvement of the public administration system and promotion of energy efficiency.

Implementation of the Energy Efficiency Program should make it possible to:

- Increase the levels of heat supply for the population and reduce the use of natural gas in heat production for heating of the residential stock by 60 percent and of public buildings by 35 percent;
- Reduce State Budget expenditures on utility services of energy supply for public buildings by 50 percent;
- Reduce consumption of imported natural gas by 25 percent.

The tentative volume of funding of the Energy Efficiency Program is UAH 344.77 billion including UAH 6.46 billion from the State Budget, UAH 15 billion from local budgets and UAH 323.31 billion from other sources. The funding of the Energy Efficiency Program is adjusted on an annual basis in the course of preparation of the draft State Budget and draft local budgets for the relevant year within the expenditures allocated for key spending units.

The procedure for use of the funds allocated in the State Budget for implementation of the Energy Efficiency Program is specified in the Resolution of the Cabinet of Ministers dated 29 June 2011 No. 68. In accordance with this Procedure, the main owner of the allocated budget funds is the State Energy Efficiency Agency.

The Procedure for competitive selection of energy efficiency projects that will receive support from the funds allocated in the State Budget for implementation of the Energy Efficiency Program, is approved by the Order of the Ministry of Economic Development and Trade No. 105.

The projects submitted for the competitive selection by customers should be included into the action plan of an approved regional or sectoral program of energy efficiency or reduction of energy consumption by public institutions through efficient use for the relevant year. They should comply with the goals and objectives of the Energy Efficiency Program. The Procedure lists the documents to be submitted by the applicant. Then the commission reviews and evaluates submitted projects divided by relevant categories.

However, insufficient funding made it impossible to reach goals for the Program’s indicators by the deadline.

At the same time, the Cabinet of Ministers of Ukraine passed Resolution No. 77 dated 8 April 2015 “Some Issues in Use of Funds for Energy Efficiency and Energy Saving in 2015”, which approves the spending of UAH 495.7 million for the Program. The funding was received in the past by the special fund of the State Budget from the European Union as tranches under the funding Agreement for the Program “Support of Implementation of the Energy Strategy of Ukraine in Energy Efficiency and Renewable Energy Sources”.

References:

96 Resolution of the Cabinet of Ministers of Ukraine of 1 March 2010 No. 243 “On Approval of the State targeted economic program of energy efficiency and development of the sector of production of the energy resources from renewable energy sources and alternative fuels for 2010-2015”. – Available at: http://zakon4.rada.gov.ua/laws/show/243-2010-%D0%BF.


b) State support for implementation of energy saving measures by ABCOAs, Housing Construction Cooperatives and residents


Due to the difficult economic situation and for the purposes of motivating the population, Apartment Building Co-Owners Associations (ABCOAs) and Housing Construction Cooperatives (HCCs) to implement energy efficiency measures, on April 8, 2015, the Cabinet of Ministers passed Resolution No. 231 “On Amendments to the Resolutions of the Cabinet of Ministers of Ukraine dated 1 March 2010 No. 243 “On Approval of the Targeted State Economic Energy Efficiency Program and Development of Energy Resources from Renewable Energy Sources and Alternative Fuels for 2010 – 2015” and dated 17 October 2011 No. 1056 “Some Issues in Use of Funds in the Energy Efficiency and Energy Saving Areas”.

For instance, Resolution No. 231 stipulates that tentative volume of funding of the Targeted State Economic Energy Efficiency Program is UAH 343.42 billion including UAH 5.11 billion from the State Budget, UAH 15 billion from local budgets and UAH 323.31 billion from other sources.

The procedure for use of the funds allocated in the State Budget for implementation of energy efficiency measures and energy saving provides for:

- Motivation of residents to implement energy efficiency measures through compensation of a part of the loan taken for the purchase of energy efficient equipment and/or materials; and for the purchase of boilers using any types of fuel and energy (except natural gas);
- Motivation of apartment building co-owner associations and housing construction cooperatives to implement energy efficiency measures through compensation of a part of the loan taken for the purchase of energy efficient and/or materials.

In addition, Resolution No. 1056 contains a list of such equipment.

Compensation of a part of the loan to the borrower is made in the following scope (Graph 12):

- 40% of the loan taken by the ABCOA or HCC for the purchase of energy efficient equipment and/or materials but not more than UAH 14,000 per one apartment in an apartment block under one loan agreement;
- 20% of the loan for the purchase of boilers using any types of fuel or energy (except for the natural gas) but not more than UAH 12,000 under one loan agreement;
- 30% of the loan for the purchase of energy efficient equipment and/or materials by residents but not more than UAH 14,000 under one loan agreement.

If the borrower is an individual eligible in accordance with the legislation for a subsidy/reimbursement of the costs of the housing and utility services, the reimbursement of a part of the loan is made as a one-time payment in the following amounts:

- 70% of the loan for the purchase of boilers using any type of fuel and energy (except for natural gas and electricity (other than thermal storage heating and hot water supply) and relevant additional equipment and materials, but not more than UAH 12,000 under one loan agreement;
- 70% of the loan for the purchase of energy efficient equipment and/or materials listed in Resolution No. 1056, but not more than UAH 14,000 under one loan agreement.

Residents of single-family houses are most actively using the opportunities of the State Program. As of September 07, 2015 (10 months since the beginning of implementation) the number of loans obtained is 25,434 for the total of UAH 428.8 million. At the same time, residents of multi-family buildings are more reserved in using this funding. For instance, as of September 07, 2015, only 44 ABCOAs/HCCs took part in the State Program (crediting started in April 2015) and took loans for implementation of fast-payback energy efficiency measures for the total amount of almost UAH 5.8 million.

101 If the borrower is an ABCOA or a HCC that has in its apartment building registered individuals (actual residents) eligible to the subsidy in accordance with the procedure established by law for compensation of the costs for payment for the housing and utility services, the part of the loan for the purchase of boilers using any type of fuel and energy (except natural gas and electricity (other than thermal storage heating and hot water supply) and relevant additional equipment and materials shall be compensated for such borrowers as a single-time payment in the amount calculated according to the formula contained in Resolution No. 1056.
With regard to ABCOAs, it is important to note that the Verkhovna Rada passed Law No. 417-VIII dated 05.14.2015 “On Specifics of Realization of the Ownership Right in Multi-Family Buildings”. The law introduced changes to the Civil Code of Ukraine for the term “multi-family buildings”, which is defined as a building with a separate address containing 2 or more apartments. Under the law, owners of the apartments are considered to be co-owners of the multi-family building and the land plot on which the building is located. The co-owners have the right to obtain information about other co-owners. The property management mechanism in multi-family buildings has also been adjusted: rather than having one vote, each ABCOA member’s vote is tied to the number of square meters of the housing area (the so called “voting with meters”).

Adoption of the Law was a progressive step for the following reasons:

- It will contribute to the radical change and reform of the relations in the housing sector between citizens, local governments and business entities that provide utility services;
- It creates favorable conditions for motivation of citizens for efficient management of joint property in multi-family buildings;
- It sets the legal foundation for attraction of investments into energy efficiency in multi-family buildings.

In addition, Law No. 263-VIII “On Amendments to the Tax Code of Ukraine with Regard to Taxation of Certain Non-Profit Organizations” adopted in March 2015 restored the status of non-profit organizations to associations of multi-family building co-owners, homeowner associations and housing construction cooperatives. The Law corrected the situation created by the amendments to the Tax Code adopted on 28 December 2014. These amendments took away non-profit states from ABCOAs as of 1 January 2015 and meant taxation of such organizations including contributions and savings of ABCOA co-owners for capital renovation and energy efficiency measures in their buildings.
c) Program “State Support of Energy Saving Measures through the Mechanism of Easing of Loans”

To attract credit resources for implementation of modern energy efficiency technologies in manufacturing, the State Budget provides for the Budget Program “State Support of Energy Saving Measures through the Mechanism of Easing of Loans” (Main owner of funds: State Energy Efficiency Agency). The procedure for use of the funds is approved by the Resolution No.439 of the Cabinet of Ministers of Ukraine dated 04.13.2011. The procedure of the competitive selection is approved by the Order of the Ministry of Economic Development dated 09.27.2011 No.64.

The procedure for the use of funds stipulates that budget funds must be used for compensation of the payment of interest on the loans in the national currency taken by business entities for implementation of investment projects, particularly, those connected with the reduction of consumption of natural gas (hereinafter compensation). The compensation is issued in the amount of the National Bank’s refinancing rate in force as of the date of payment of the interest, but not more than the interest rate of the loans taken by such business entities.

Business entities that took loans for implementation of energy efficiency projects are eligible for compensation on a competitive basis. For instance, at its meeting, the specially established Commission reviews and evaluates the energy efficiency projects, which are divided into the following categories:

   a) Projects for manufacturing of energy efficient equipment;
   b) Projects for reduction of energy intensity of production;
   c) Projects using alternative (renewable) fuels and renewable energy sources.

Mentioned Commission assigns points to each project based on the percentage of compliance with the energy efficiency target.

The Order of the Ministry of Economic Development dated 09.27.2011 No.64 also approved the template of the Compensation Agreement of the Interest Rate for the Loans Taken by Business Entities for Funding of Energy Saving Measures.

Thus, the effective mechanism of compensation of the interest rate for the loans is as follows:

1. Preparation of the project;
2. State expert examination on energy saving;
3. Entry of investment projects and project (investment) proposals into the State Registry;
4. Receipt of the loan for implementation of the project;
5. Announcement of the competitive selection of projects by the State Energy Efficiency Agency;
6. Submission of the package of documents by the borrower to the State Energy Efficiency Agency for participation in the competition;
7. The competition commission reviews and evaluates projects according to the criteria and makes preliminary decisions;
8. The State Energy Efficiency Agency makes its final decision and enters into relevant agreements with winning borrowers for the compensation of interests paid under the loan;
9. Compensation of the interest.

In 2014, UAH 6 million was allocated in the State Budget for governmental support of energy saving measures through the mechanism of easing the loans.

The Program failed to accomplish its goals due to insufficient funding.

108 Since 06.02.2015 – 19.5%.
5.3. Ukrainian banks working in the energy efficiency area

Today, many Ukrainian banks including the partners of various international financial organizations cooperate with national crediting programs in the energy efficiency area and offer credit products to ABCOAs and other legal entities. Below, some of the banks and their products are presented.\(^{111}\)

a) UkrGasBank

In 2013, UkrGasBank implemented a program for crediting of ABCOAs developed in cooperation with the experts of the International Financial Corporation (IFC).

Since 2014, UkrGasBank has been implementing a partnership program with manufacturer of energy efficient equipment. In December 2014, the company Gresa Group in cooperation with UkrGasBank developed a credit program for purchase of energy service equipment and heat insulation of buildings. The loan is provided by UkrGasBank in a partnership program with Gresa Group on the following conditions: up to 60 months against 3% per annum (in UAH). The credit program is designed for apartment building co-owner associations (ABCOAs), legal entities and individual entrepreneurs representing small and medium-sized businesses. The loans are issued for the following goods: heating, power generation, water heating and climate equipment, as well as heat insulation systems. In addition, the partnership program allows funding turnkey projects – from design through complete commissioning.\(^{112}\)

The Bank also developed a program Comprehensive Offer for Apartment Building Co-Owner Associations for implementation of investment and innovation projects by ABCOAs in the housing and utility sector. The Program provides for loans in Ukrainian hryvnias for the period to 60 month at the annual interest rate of 17.0% with the term of crediting of ≤ 12 months, and 17.5% per annum with the term of crediting over 12 months.\(^{112}\)

b) Oschadbank

In 2014, Oschadbank started issuing loans to individuals as a part of the governmental energy saving program for purchase of the boilers using any types of fuel and energy except natural gas.

In addition, Oschadbank started cooperation with International Financial Corporation (IFC) at the end of 2014 as part of the Project Energy Efficiency in the Housing Sector of Ukraine. International Financial Corporation provided Oschadbank with advice on establishment of the program for energy saving funding for ABCOAs. As a result, the Bank developed a special crediting product.\(^{114}\)

The Project will be implemented in all regions of Ukraine. In addition, each Oblast branch of Oschadbank will have a specialist who will provide citizens with advice on establishment of ABCOAs and the mechanisms of funding of energy efficiency measures in such associations.\(^{115}\)

In 2015, Oschadbank started working on crediting of ABCOAs for the purchase of the materials and equipment for energy efficiency improvement.\(^{116}\)

c) MegaBank

Currently, MegaBank is implementing four investment projects for energy efficiency improvement with four foreign partners. The investment potential amounts to several dozen million US dollars. In particular, an agricultural company attracted USD 3 million of investments as part of one project, which made it possible to reduce fuel consumption by 50%.\(^{117}\)

<table>
<thead>
<tr>
<th>Loans for ABCOAs and HCCs</th>
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<tbody>
<tr>
<td>• PJSC JSB “Lviv”: compensation of interest on the loans for energy saving for ABCOAs</td>
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<tr>
<td>• PJSC “Megabank”: microloans for energy saving</td>
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<td>• JSC “MetaBank”: crediting for ABCOAs and HCCs</td>
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<td>• PJSC “OKCI Bank”: financial program for ABCOAs</td>
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<td>• PJSC JSB “UkrGasBank”: offer for ABCOAs for implementation of investment and innovation projects</td>
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<tr>
<td>• Joint Program of “GRESA GROUP” and “UkrGasBank”: loans against 3% p.a. up to 60 months for energy efficient equipment</td>
</tr>
<tr>
<td>• PJSC “UkrInBank”: loans for construction and assembly works</td>
</tr>
</tbody>
</table>


113 Comprehensive Offer for Apartment Building Co-Owner Associations // UkrGasBank. – Available at: http://www.ukrgasbank.com/rus/sme/credit/osbb/.


115 Ощадбанк розпочав співпрацю з Міжнародною фінансовою корпорацією // Delo.ua. – 05.11.2014. – Available at: http://delo.ua/finance/oschadbank-nachal-sotrudnichestvo-s-mezhdunarodnoj-finansovoj-korporaciej-ko-282601/?updated_new=1422095774.


117 Голова правління “МЕГАБАНКА” взяла участь у Міжнародному економічному форумі // MEGABANK. – 05.09.2014. – Available at: http://195.46.56.44/hnewa/1611/.
MegaBank offers funding for energy saving projects aimed at accomplishing the following:

- Reduce energy costs, energy dependence and CO₂ emissions;
- Increase environmental responsibility (climate change awareness);
- Create more attractive crediting conditions.

Loans for energy savings are issued to legal entities or individual entrepreneurs that have been engaged in business activities for at least 6 months in trade, and 9 months in services and manufacturing (without interruptions) prior to the application for the loan.\(^\text{118}\)

**d) Raiffeisen Bank Aval**

Raiffeisen Bank Aval is one of the banks in Ukraine working (since 2014) with the UKEEP Program. This allows existing and potential clients of Raiffeisen Bank Aval to obtain funding for energy efficiency and renewable energy projects. We have already described the idea of the Program above.

Loans are issued to private enterprises (51% or more in private ownership) that have at least 2 years of business experience.\(^\text{119}\)

**e) State Export and Import Bank of Ukraine PJSC (UkrExImBank)**

Since 2007, UkrExImBank has been working with EBRD under the UKEEP Program for medium and long-term crediting of the SME segment for implementation of investment projects in sustainable energy (industrial energy efficiency and renewable energy sources). Funding is available for private Ukrainian companies. They must be residents of Ukraine, have annual turnover of up to the equivalent of EUR 50 million and the balance-sheet total up to the equivalent of EUR 43 million (they cannot belong to groups with annual turnover above the equivalent of EUR 50 million and the balance-sheet total above the equivalent of EUR 43 million), and employ 249 employees or fewer.

Also, UkrExImBank and the World Bank signed a loan agreement and a guarantee agreement on 10 June 2011. The loan of USD 200.0 million for 30 years is effective and the Project’s funds are available for the following uses: support of selected private banks expanding their energy efficiency activities in industrial and municipal sector; funding for investments into improvement of energy efficiency at industrial facilities and municipal companies.\(^\text{120}\)

\(^{118}\) Microcredits for energy saving // MEGABANK. – Available at: http://www.megabank.net/en/energy_efficiency/.

\(^{119}\) Energy Efficiency Funding Program UKEEP // Raiffeisen Bank Aval. – Available at: http://www.aval.ua/ru/corporate/finbizn/ukeep/.

\(^{120}\) Loans under EBRD Energy Efficiency Program // UkrExImBank. – Available at: https://www.eximb.com/ukr/corporate/loans/energo/.
VI. LEGAL FOUNDATION FOR ESCO ACTIVITIES
VI. LEGAL FOUNDATION FOR ESCO ACTIVITIES

6.1. European energy efficiency legislation and its implementation

On 1 February 2011, Ukraine became a member of the Energy Community (EC). Signing the EC Treaty Ukraine undertook an obligation to implement relevant EU directives.

These directives on energy efficiency and renewable energy include the following:

- **Directive 2012/27/EU on energy efficiency of 25 October 2012**: (formerly – Directive 2006/32/EU of 5 April 2006 on energy end-use efficiency and energy services);
- **Directive 2010/30/EU of 19 June 2010 on the indication by labeling and standard product information of the consumption of energy and other resources by energy-related products**;
- **Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings**;

6.1.1 General provisions of Energy Efficiency Directives

a) **Directive 2012/27/EU**

On 10.25.2012, Directive 2006/32/EU was replaced with Directive 2012/27/EU on energy efficiency that came into effect for EU member states on 4 December 2012. In addition, in October 2015 the decision was made at the meeting of the High-Level Standing Group and at the meeting of the Ministerial Council of the Energy Community to implement Directive 2012/27/EU on energy efficiency within the Energy Community.

Key measures under Directive 2012/27/EU:

- **Reconstruction of buildings**: EU member states must reconstruct at least 3% of the heated area of the buildings occupied by public authorities;
- **Increase of efficiency of the energy systems**: energy companies subject to this Directive must achieve a certain level of energy efficiency of the production processes and energy transportation (one of the requirements is annual reduction of the total energy consumption by 0.5% to 0.7% in 2017 through 2020);
- **Introduction of mandatory energy audits**: a broad list of organizations and companies – major energy consumers that need to undergo the energy audit procedure (the energy audit must be conducted no later than 3 years after the enactment of the Directive (2012) and must be repeated every 4 years by qualified energy auditors);
- **Efficiency improvement of the systems of heating and air conditioning**: by December 2015, all EU member states must complete and submit reports to the European Commission on the current status and plans for combined generation of heat and electricity for heating and air conditioning. Updated reports should be filed every five years;
- **Development and implementation of funding mechanisms**: state authorities should develop and implement certain mechanisms for funding/investments into energy efficiency improvement or use existing mechanisms for investments in energy efficiency;
- **Setting national goals**: the overall goal for reduction of energy consumption in the EU is 20% by 2020, while each EU member state should set its own targets for improvement of energy efficiency and update its strategies every three years (2014, 2017 and 2020);
- **Implementation of monitoring of energy resources**: introduce monitoring of the consumption of all energy resources at the end user level by the end of 2016.

126 Directive 2006/32/ EU (term of transposing – 31.12.2011). The Directive indicated that by 2009 the member states should adopt and try to achieve the national indicative target of 9% on the ninth year of the Directive’s application (annually, starting in 2006, to improve the energy intensity of the end consumption additionally by one percent) through provision of energy services and implementation of other measures for improvement of energy efficiency. The EU member states should prepare action plans and submit three reports on achievement of the target (in 2007, 2011 and 2014).
b) Directive 2010/30/EU

Directive 2010/30/EU (term of transposing – 12.31.2012) outlines the rules for information about products offered to the end consumer. The document harmonizes national procedures of energy labeling of the household appliances and light bulbs. It covers both household appliances and products that do not consume energy but have direct or indirect impact on its saving.

c) Directive 2010/31/EU

Directive 2010/31/EU (term of transposing – 09.30.2012) indicates that the member states take necessary measures to set minimum requirements for the energy characteristics of buildings or their parts. Also, one of the key requirements of Directive 2010/31/EU of 19 May 2010 is acquisition of the energy certificate in order to be able to let or sell the building to show to a potential lessee/buyer that the building complies with the minimum energy efficiency requirements.

d) Directive 2009/28/EU

According to the provisions of Directive 2009/28/EU (term of transposing – 12.05.2010), EU states take an obligation to reduce greenhouse emissions by 2020 by 20% compared with 1990, bring the share of renewable energy sources in EU total consumption to 20% and increase energy efficiency of the European economy by 20%. Also, the Directive sets 10% use of renewables as a mandatory requirement for the transport sector by 2020.

6.1.2. Implementation of Energy Efficiency Directives in Ukrainian legislation

On 26 November 2014, the Cabinet of Ministers of Ukraine approved action plans for implementation of the EU Directives for energy efficiency.129

The document approves the algorithm for implementation of key EU Directives in the area of energy efficiency.

It is expected that the measures set in the action plans will be implemented through amendments to legislation, building codes, introduction of fiscal metering in utility sector, energy audits and implementation of the energy labeling of the products.130

In addition, the Cabinet of Ministers of Ukraine approved the action plan for implementation of the Directive of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources on 3 September 2014 via its Order No. 791-p.131

Regarding the current status of implementation of the Directives based on the EU-Ukraine Action Plan on 25 November 2015 the Cabinet of Ministers of Ukraine approved the National Energy Efficiency Action Plan (NEEAP). For instance, the energy saving target for Ukraine under the National Energy Efficiency Action Plan is 9% by 2020.133

On 1 October 2014, the Cabinet of Ministers of Ukraine in its Order No. 902-p approved the National Renewable Energy Action Plan for the period until 2020134 and the Action Plan for Implementation of the National Renewable Energy Plan for the period until 2020. According to the Order of the Cabinet of Ministers, the share of electricity generated in Ukraine using renewable sources should reach at least 11% in the total energy consumption by 2020.135

It should be noted that the requirements of Directive 2006/32/EU have been incorporated into building regulations. For instance, mandatory monitoring of electricity and thermal energy, consumption of water and gas by buildings (apartments) is envisaged by all types of energy resources.136 In addition, draft laws are being developed in Ukraine to regulate ESCO activities that will be discussed below.


135 Also, in accordance with the Decision D / 2012/04 / MC-EnC, Ukraine undertook an obligation to achieve the level of 11 percent of energy generated from renewable sources in the total structure of the country’s energy consumption by 2020, which will be a strong incentive for further development of renewables in Ukraine.

Directive 2010/30/EU and a part of the rules have been formally adopted into Ukrainian legislation via Resolution No.7002 of the Cabinet of Ministers dated 7 August 2013 “On Approval of Technical Rules for Energy Labeling”. In accordance with the document, refrigerators with volumes from 10 liters to 1,500 liters, powered from the electric grid or rechargeable batteries, and washing machines must be labeled. Labeling is not applied to used goods and vehicles for passenger or cargo transportation. Also, the State Energy Efficiency and Energy Saving Agency is in charge with ensuring adherence to these technical rules. It was expected that the control will start to be exercised on 1 July 2015.


In the area of building standards, the requirements of Directive 2010/30/EU have been harmonized with DBN (State Building Norm) B.2.5-67:2013 “Heating, ventilation and air conditioning” and DBN B.2.5-28: 2006 “Natural and artificial lighting”.


Existing methods for setting parameters of energy efficiency for buildings have been established by regulatory documents, such as DBN B.2.6-31:2006 “Structures of buildings and constructions. Heat insulation of buildings” and ДСТУ-Н Б А.2.25:2007 “Design. Guidelines for development and execution of energy certificate for buildings for new constructions and reconstructions”.


It should be noted that the list of standards shown above is not exhaustive and when specific issues require solution, more detailed information should be sought.

6.2. Ukrainian legislation for energy efficiency and energy saving

The concept of energy saving is interpreted by current legislation as organizational, scientific, practical, informational activities aimed at efficient use and frugal consumption of the primary and processed energy and natural energy resources in the national economy and are implemented through technical, economic and legal means.140

According to the Draft Energy Strategy of Ukraine for the period to 2035 “unlike developed industrial countries where energy saving is an element of economic and environmental expedience, for Ukraine energy efficiency is an issue of survival in market conditions and key for entry into European and world markets. Energy saving is one of determining factors for the Energy Strategy of Ukraine. Efficiency of the national economy depends the level of energy efficiency”.141

6.2.1. Law of Ukraine “On Energy Saving”

Back in 1994, the Verkhovna Rada adopted Law No. 74/94-BP “On Energy Saving”.142 The document outlines key principles of the state policy in the area of energy saving including:

- Creation of energy-saving structure of material production based on comprehensive resolution of economy and energy saving issues taking into consideration environmental requirements, wide implementation of

138 Regulatory activities. – Available at: http://isae.gov.ua/u/activity/nehulyatorna-diyalnist.
139 Як оцінює енергоефективність будівель. – Available at: http://energefficiency.in.ua/stat/energoeffektivnosti-i-energosberezhenie/12-yak-otsiniti-energetichnu-efektivnist-budinku.html.
140 Law of Ukraine “On Energy Saving” of 01.07.1994 No. 74/94-BP. – Available at: http://zakon4.rada.gov.ua/laws/show/74/94-%D0%82%D1%96.
innovative energy saving technologies;

- Resolution of energy saving problems combined with implementation of the Energy Program of Ukraine, as well as on the basis of the broad inter-state cooperation;
- Gradual transition to mass use of the equipment for metering and regulation of the consumption of fuel and energy resources;
- Mandatory monitoring by the suppliers and consumers of the volumes of the fuel and energy resources used based on the readings of metering equipment (when installed);
- Implementation of the system of energy labeling of the household appliances, etc.

In essence, the Law “On Energy Saving” is declarative – it does not contain any direct action mechanisms. The proposals for improvement of this Law, suggested in past several years, did not find support. At the same time, the State Energy Efficiency Agency plans to develop the Law “On Efficient Use of the Fuel and Energy Resources” in 2015, which is aimed at improvement of the shortcomings of the current Law.


The Program’s key objectives are:

- Technical re-equipment of the housing and utility sector, reduction of specific indicators of the consumption of energy and material resources necessary for the production (provision) of the housing and utility services including the creation of an effective and transparent mechanism for stimulation of the alternative energy sources and fuels;
- Attraction of investments and cooperation with international financial institutions and donor organizations.

The Program’s objectives have been achieved only in part due to the insufficient budget funding and lack of necessary mechanisms to attract investment resources.

6.3. Legislation regulating ESCOs

The use of ESCOs for energy efficiency improvement is discussed in the Methodological Recommendations on Creation of the System of Economic Stimulation of Implementation of Energy Saving Measures at the Enterprises of the Housing and Utility Sector issued by the Ministry of Housing and Utility Sector of Ukraine. In particular the document mentions that the local system of economic stimulation of energy saving measures in businesses can include: ESCOs, other investors involved in the implementation of energy saving measures according to the terms and conditions that provide enterprises of the housing and utility sector with advantages compared to other possible forms of funding of energy saving measures, particularly by: investing their own capital into energy saving measures and covering a part of the implementation costs; ensuring and guaranteeing profitability of energy saving measures with their own capital; having the enterprises pay the cost of equipment and services by installments during the term set by the agreement and exclusively out of the funds that have been already received from the savings of the fuel, energy resources and water.

In addition, the following draft laws on fundamentals of ESC implementation in public institutions were registered by the Verkhovna Rada in the summer of 2014 after long work and discussions:


On 9 April 2015, these Draft Laws were adopted as a whole and registered as the Law No. 327-VIII dated 04.09.2015\cite{147} and the Law No. 328-VIII dated 04.09.2015.\cite{148} These documents regulate ESCO activities in Ukraine. They mainly deal with ESCO activities in the public sector. For instance, the Laws provide a definition of ESC,\cite{149} its material terms and conditions, specifics of conclusion of ESCs by publicly funded institutions, procedure for selection of energy service contractors for public institutions, competitive procedure; and regulate performance of energy audits. In addition, Law No. 328-VIII introduces changes into the Budget Code, particularly, by introducing the term of long-term budget obligation, etc.

We will discuss the provisions of Laws No. 327-VIII and No. 328-VIII in detail later.

6.4. Energy service agreements in publicly funded institutions

6.4.1. Specifics of budget legislation

According to some Ukrainian experts, energy performance contracting in publicly funded institutions is a program for implementation of energy saving measures in administrative buildings funded by budgets of any level, under which a public institution (represented by a relevant central or local executive authority) enters into a contract with ESCO for energy audit of the building and implementation of an energy saving project on its basis.\cite{150}

As previously stated, ESCOs in developed countries more often sign agreements with customers from the public sector because, first of all, the bankruptcy risk us very low, and, secondly, there is only one owner (as opposed by multi-family buildings, for instance) and, consequently, the contracting procedure is simpler and more understandable. However, publicly funded institutions in Ukraine have their own specifics.

One of those specifics is that most employees and managers of publicly funded institutions are not interested in implementation of energy saving measures. They understand that energy efficiency measures will lead to reduced energy costs (with an immediate write-off into the budget) which, in turn, will result in reduced funding in following years.

The idea of the necessary energy service mechanism for publicly funded institutions is to make it possible for the savings to be accumulated on a separate account and then use them for energy saving measures and compensation of the investor’s costs.\cite{151}

The Budget Code of Ukraine provides for targeted use of budget funds. This means that budget funds are only used for the purposes set by budget assignments and budget allocations.\cite{152} Also, their use must be as cost-efficient, as possible. The goal of budget spending is approved in the budget estimate — the main planning document of publicly funded organizations, which entitles it to receive revenues and make expenditures within a budgetary period.

The Order of the Ministry of Finance approves the Guidelines on the Procedure for Use of the Economic Classification of Budget Expenditures used to clearly differentiate the expenditures of publicly funded institutions and publicly funded organizations, which entitles it to receive revenues and make expenditures within a budgetary period.

The following codes apply to ESCOs:

- **Code 1160 “Payments for utility services and energy resources”**: This category includes payments by publicly funded institutions/organizations for utility services and energy resources including payments for energy for industrial and public needs (including the costs of maintenance and operation of the leased real estate).
- **Code 1161 “Payments for heating”**;
- **Code 1163 “Payments for electricity”** — payments for electricity (including street lighting) including payments for electricity transportation services;
- **Code 1164 “Payments for natural gas”**;

\begin{itemize}
  \item Code 1160 “Payments for utility services and energy resources”\cite{154}; This category includes payments by publicly funded institutions/organizations for utility services and energy resources including payments for energy for administrative buildings and public needs (including the costs of maintenance and operation of the leased real estate).
  \item Code 1161 “Payments for heating”;
  \item Code 1163 “Payments for electricity” — payments for electricity (including street lighting) including payments for electricity transportation services;
  \item Code 1164 “Payments for natural gas”;
\end{itemize}

\begin{itemize}
  \item According to Article. 55 of the Budget Code, payments for utility services and energy resources is a protected line item of the budget (protected line items of the budget are expenditures of the general fund in the volume that cannot be changed in the course of reduction of the approved budget allocations).
\end{itemize}
● Code 1165 “Payments for other services”. The expenses covered by this Code are:
  a) Payments for other utility and operation services (cleaning of buildings, courtyards, streets, removal of waste; lease of waste containers, cleaning of parks, gardens, squares, grounds, public places, cemeteries; removal of unauthorized landfills, washing, heat insulation, fumigation, disinfection and disinfestation of premises; maintenance of escalators, elevators, garbage chutes, antennas, etc.);
  b) Costs of technical and other maintenance (except repair) of street lighting systems, internal and external networks of the heat, water, electricity supply and sewerage, etc.;
● Code 1166 “Payments for other energy resources”;
● Code 1134 “Payments for services (other than utility services)”. Among other things, this includes: payments for installation of meters for water, natural gas and heat; installation of gas boilers and gas cookers.

This means that one of the constraining factors for efficient work of ESCOs in publicly funded organizations was the impossibility to use the budget funds saved through investments into energy saving and energy efficiency for the ESC repayment. Such payments could be considered misuse of public funds.

Misuse of public funds is their use for the purposes that do not comply with:

- Budget allocations outlined in the Law on the State Budget of Ukraine (resolution on the local budget);
- Spending targets set in the budget program certificate or the procedure for use of budget funds;
- Budget assignments.\(^{155}\)

The Code of Administrative Offences and the Criminal Code stipulates levels responsibility for misuse of public funds depending on the amounts of misused funds.

In particular, misuse of public funds is use of funds for purposes other than specifically stated for them. Article 118 of the Budget Code authorizes officers of agencies of control and audit to suspend budget allocations in cases of misuse of public funds and apply administrative punishments (with high penalties) to the persons guilty of budget violations.\(^{156}\)

In addition, if a publicly funded institution achieves savings in payments for utility services, it must return unused funds back into the budget. In addition, funding for this specific line item will be cut in the next budget period. This means that the funds saved by the organization will be transferred to a different publicly funded institution that did not implement any energy saving measures.

In order to avoid this, it would be necessary for the budget holder to give its consent for the transfer of the saved funds from the line item of utility payments to the line item of energy saving measures. At the same time, the Law No. 328-VIII dated 04.09.2015 made it possible to implement energy service contracts through relevant amendments to the Budget Code discussed below.

6.4.2. Analysis of legislative provisions for implementation of energy service contracts in publicly funded institutions

6.4.2.1. Definition of energy service and savings aspect

In the Law "On Introduction of New Investment Opportunities, Guarantees of the Rights and Lawful Interests of Business Entities for Large-Scale Energy Modernization" of 04.09.2015 No. 327-VIII (Law No. 327-VIII), energy service agreement is defined as an agreement where the subject matter is energy services rendered by an energy service contractor. These services are paid with the savings from reduced consumption and/or reduced costs of the fuel and energy resources and/or housing and utility services. The reduction in cost comes, in turn, from the energy services provided (in comparison with such consumption (costs) in the absence of such measures). Energy service is defined as a set of technical and organizational energy saving/energy efficiency and other measures aimed at reduced consumption and/or costs of fuel and energy resources and/or housing and utility services by the energy service customer (in comparison with such consumption (costs) in the absence of such measures).

This approach gives the option to tie the evaluation both to the reduction of consumption, i.e. natural consumption volumes, and to the reduction of financial costs. As mentioned before, the parties should positively agree on basic indicators that will be used in their contract and on the results they want to achieve. It is important to understand that financial savings do not necessarily translate into savings of fuel and energy resources. Financial savings can be achieved even through simple installation of energy meters, which does not help to attain the primary goal of

\(^{155}\) See Article 119 of the Budget Code of Ukraine. – Available at: http://zakon4.rada.gov.ua/laws/show/2456-17.

\(^{156}\) See Article 118 of the Budget Code of Ukraine. – Available at: http://zakon4.rada.gov.ua/laws/show/2456-17.
energy efficiency improvement. In addition, it would be risky to evaluate only on financial indicators: Tariffs for energy resources may be increased – especially considering the need for Ukraine to fulfill IMF’s requirements –, which will mean that savings in natural consumption volumes will not represent any financial economy.

The parties’ approach should be balanced and all technical and economic factors must be taken into consideration.

### 6.4.2.2. Procurement of energy services

Law No. 327-VIII stipulates that procurement of energy services is based on the service procurement procedures in accordance with the Law of Ukraine “On Public Procurement” taking into account stipulations in the Law “On Introduction of New Investment Opportunities, Guarantees of the Rights and Lawful Interests of Business Entities for the Large-Scale Energy Modernization”. However, application of the Law “On Public Procurement” to all energy service procurements (without consideration of tender thresholds) is contentious because it unnecessarily complicates project implementation, including small projects with value below tender thresholds set by effective legislation. However, Chief Scientific Expert Department of the Verkhovna Rada criticizes simplified procedure for procurement of energy service. The rationale behind this criticism is that a situation may arise when entities working under energy service contracts and those working under other types of contracts will be procuring the same goods using different procedures, which, in itself, contradicts the goals of the public procurement legislation: support of competitive environment and efficient use of public funds.

### 6.4.2.3. Consumption baseline

Law No. 327-VIII defines the baseline level of consumption of fuel and energy resources and housing and utility services as an average value of annual consumption of fuel and energy resources, as well as housing and utility services (in physical terms) by the customer’s facility, for which energy services are procured with indication of the consumption volumes for each type of fuel and energy resources and housing and utility services equal to the average for three years immediately before the year of energy service procurement. However, if the customer or a participant of the procurement procedure discovers that any violations of air and heat requirements, lighting intensity or other building maintenance requirements – set by sanitary norms for labor management, maintenance of buildings and structures – occurred at the site for which the energy service is being procured and that such violation took place in the period, for which the consumption volumes for fuel and energy resources and housing and utility services are being calculated, the baseline annual level is set in accordance with the procedure approved by the central executive authority in charge of the development of the state policy for use of fuel and energy resources, energy saving, renewable energy sources and alternative fuels.

This option is provided for specifically for cases when buildings were “underheated”, as well as to make sure that parties do not consciously use incorrect data for their calculations, which would cause the contractor to increase its costs for fuel and energy resources in order to ensure proper heating or lighting precluding the possibility of any financial or physical savings, or leading to the economic effect below the planned level. Therefore, it is critical for the parties to agree in their contract whether they take the baseline consumption (estimated consumption figures) or actual consumption as a basis.

In European countries, the principles of setting the baseline level of energy resource consumption are set in the standard ISO/CD 50006 Energy baseline and energy performance indicators (EnPIs) – General principles and guidance. **157**

This standard sees a correctly set baseline as a guarantee for an objective evaluation of the implemented energy efficiency measures. The standard offers a methodology for setting the baseline, which requires establishing a baseline period and consideration of a number of factors that influence the volume of energy consumption in this period (patterns of the building operation, natural and climatic fluctuations, etc.). Considering this, defining the baseline according to the guidelines of Law No. 327-VIII as the average of annual consumption levels of fuel and energy resources and housing and utility services (in physical terms) for the three years immediately before the year when public procurement of energy service is performed poses certain risks of errors in setting the baseline indicators used for calculations of the project’s feasibility study.

In addition, experience shows that many buildings of the public sector in Ukraine do not comply with the regulatory temperature profile. That is why, international financial institutions as they resolve the issues of crediting for energy efficiency improvement projects in public buildings in Ukraine request using estimated energy consumption figures as a “baseline” because they are based on the designed/normative microclimate indicators on the premises, as well as the operation mode”. In particular, this principle is used in ENSI software used by energy auditors for the pre-project
audits of buildings.

6.4.2.4. Model or standard energy service contract

The law established that standard ESC is approved by the Cabinet of Ministers of Ukraine.

It should be noted, however, that the option of the model contract was also considered. The difference between the model contract and the standard contract is that the provisions of the standard contract have the recommendatory nature for the parties whereas the provisions of the model contracts cannot be departed from. Certainly, investors prefer the standard contract as it would allow approaching each project individually and draft its provisions based on the project’s specifics. From the viewpoint of the public sector, however, investors use the model contract as they sign ESC in order to absolve themselves of responsibility for possible violations with regard to the inappropriate use of budget funds as much as possible.

The standard energy service agreement158 approved by the government establishes:

- List of energy service measures, deadlines and conditions of their implementation;
- Characteristics of the of energy service object, including general data on the energy service site, its work schedule, heating period, electricity consumption data, information on availability of the commercial and technical metering equipment at the site of energy service, etc.;
- Baseline consumption of the fuel and energy resources and/or housing and utility services at the object of energy service in physical terms with the monthly breakdown;
- Reduction in the consumption of fuel and energy resources and/or housing and utility services to be achieved as a result of energy service for each year of the contract (by the type of energy resources (housing and utility services));
- Reduction in costs of fuel and energy resources and/or housing and utility services to be achieved through implementation of energy service for each year of the contract term (by the type of fuel and energy resources (housing and utility services));
- Performance report;
- Procedure for calculation adjustment for energy service performance in case of changes in the structure or surface area, operation procedures or modes of energy service during the contract term.

6.4.2.5. Amendments to the budget legislation

The Law “On Amendments to the Budget Code of Ukraine (on Introduction of New Investment Opportunities, Guarantees of the Rights and Lawful Interests of Business Entities for the Large-Scale Energy Modernization” of 04.09.2015 No. 328-VIII (Law No. 328-VIII) introduced a number of changes and additions to the Budget Code of Ukraine aimed at resolving the issue of redistribution of the savings to pay for the utility services, to pay for ESCO services, in order to protect the company’s interest as an investor.

One of the most significant changes in the budget legislation is introduction of the concept long-term obligation under ESC. It stipulates that within the framework of an ESC, the budget funds holder that has the relevant building under its operational management or business administration must make payments during the future and/or current budget periods within the amount of reduction of expenditures for utility services and energy resources (compared to the expenditures that would have been made in the absence of the energy service). In essence, this change will serve as a guarantee for the investor whose expenses for payment for ESCO services will be earmarked in the budget for the entire term of the contract. This guarantee will be strengthened by the inclusion of the payments for energy service into Article 55 of the Budget Code, namely, adding it to the list of the protected line items of the budget. It should be noted that the Main Scientific and Expert Department and the Ministry of Finance were reluctant to accept this change because the legislators were believed to establish the priority of funding private ESCOs during the term of the contract over budget funding for other investment projects and social programs.

Nevertheless, the government realizes the urgent need to implement energy efficiency projects, such as ESCs for publicly funded institutions with the view that the budget lacks funds for implementation of energy efficiency measures, while the budget suffers immense losses due to unwise use of fuel and energy resources. Thus, the laws that regulate the procedure of ESCO activities will give momentum to energy efficiency improvement and development of the market of energy service. At the same time, one should understand that the full-fledged application of the laws requires adoption of a number of by-laws.

VII. ECONOMIC ENVIRONMENT
7.1. Pricing in the housing and utility sector

The tariffs for housing and utility services under Article 12 of the Law of Ukraine No. 5007-VI of 06.21.2012 “On Prices and Pricing” fall under the category of prices regulated by the state because they have considerable social significance, and some of those services (heating and water supply) are provided by entities with monopolistic position in the market.

The key principles of the tariff policy in the housing and utility sector are outlined in the Law of Ukraine No. 875-IV of 06.24.2004 “On Housing and Utility Services”.

According to Part 1 of Article 13 of the Law “On Housing and Utility Services” housing and utility services are divided by their functional purpose into:

- Services of maintenance of buildings and adjacent areas;
- Services of management of buildings, structures of groups of buildings;
- Services of renovation of premises, buildings or structures.

7.1.1. Competencies of public authorities

According to Paragraph 2, Article 14, Law “On Housing and Utility Services”, the prices/tariffs for utility services and maintenance of buildings, structures and adjacent areas are defined and approved by central executive authorities, national commissions in charge of the state regulation in relevant areas and local self-government bodies as part of their powers set by the law.

Contractors/producers of the housing and utility services (except electricity and gas) use the procedures for tariff setting approved by the Cabinet of Ministers of Ukraine in accordance with Article 31 of the Law “On Housing and Utility Services” to calculate economically justified costs for production (provision) of services. These costs are submitted in compliance with licensing conditions to the National Commission – which performs state regulation for energy and utilities (NEURC or the Commission) – or to local self-government bodies.

In accordance with Subparagraph 7, Paragraph 4 of NEURC Regulation approved by the Decree of the President of Ukraine dated 09.10.2014 No.715/2014 the Commission defines:

- Prices (tariffs) for electricity, tariffs for its transmission and supply;
- Retail prices for the natural gas used for household needs;
- Price ceilings for natural gas for institutions and organizations funded from the State Budget and local budgets, for industrial consumers and other business entities;
- Price ceilings for natural gas for business entities engaged in generation of thermal energy including block (module) boiler stations installed on the roofs or outbuildings (based on the volume of the natural gas used for production and provision of heating and hot water supply to residents and religious organizations on conditions that such business entities keep separate metering and accounting of heat and water);
- Tariffs for thermal energy generated at combined heat and power plants (CHPs), nuclear power plants and cogeneration plants and installations using non-traditional or renewable energy sources;
- Tariffs for utility services for the natural monopoly entities and business entities at adjacent markets licensed by NEURC.

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161 Resolution of the National Commission Exercising State Regulation in the Area of Utility Services of 10.08.2012 No. 276 “On Approval of the License Terms for Business Activities on Production of Heat Energy (other than generation of thermal energy at combined heat and power plants (CHPs), nuclear power plants and cogeneration plants and installations using non-traditional or renewable energy sources)”. – Available at: http://zakon2.rada.gov.ua/laws/show/1875-15.
Previously these functions were performed by the National Commission Performing State Regulation in the Area of Utility Services and the National Commission Performing State Regulation in the Area of Energy that were abolished by the Decrees of the President of Ukraine of 08.27.2014 No. 692/2014 and No. 693/2014 respectively.

In accordance with the Law of Ukraine “On Housing and Utility Services”, local self-government bodies define the tariffs for generation, supply and transportation of thermal energy, as well as centralized water supply and sewerage to the business entities that are not NEURC licensees, particularly, if:

Thermal energy was supplied from the business entity’s sources in the volume not exceeding 20,000 GCal per year for the needs of consumers;

● Thermal energy was supplied from the business entity’s heating networks and heating units in the volume to 18,000 GCal per year for the needs of consumers;
● Volumes of thermal energy supplied for the needs of consumers did not exceed 18,000 GCal per year;
● They provide services of centralized water supply and/or centralized sewerage in one or several localities with the aggregate population below thirty thousand and the volumes of services are: centralized water supply – less than three hundred cubic meters per year; centralized sewerage – less than two hundred cubic meters per year.

In addition, local self-government bodies have exclusive powers to set the tariffs for maintenance of buildings and adjacent areas.

Local self-government bodies must set tariffs for housing and utility services at the level no lower than economically justified costs for their production (provision).

If a local self-government body sets the tariffs for housing and utility services at the level that makes it impossible to generate income, the authority that approved them must compensate contractors/producers for the difference between the set level of prices/tariffs and the economically justified costs for production of the services from the relevant local budget.

The expenditures for compensation of the losses of the companies due to the tariffs for housing and utility services set at the level that makes it impossible to receive income are financed from the relevant local budget.

Setting prices/tariffs for housing and utility services below the level of economically justified costs of their production without a relevant compensation is prohibited and may be appealed in court.

Central executive authorities and national commissions performing state regulation in the relevant areas are held liable for the consequences of setting or regulation of prices/tariffs that may be changed by them in accordance with their jurisdiction.165

If the prices/tariffs for services/goods are changed by central executive authorities performing state regulation in the relevant area, and they cause unforeseen costs for contractors/producers, the central executive authorities must compensate the losses caused by these changes in full within the current financial year before approval of the new budget. In particular, according to the Ministry of Finance of Ukraine, the amount of the subvention from the State Budget to local budgets for repayment of debts caused by tariff differences in 2014 was UAH 12423.1 million compared to UAH 2052.5 million for the same period in 2013.166

7.1.2. Principles and procedures of setting (approval) of the tariffs for housing and utility services and energy prices

According to Article 31 of the Law “On Housing and Utility Services”, the procedure for setting the tariffs for each type of housing and utility services is established by the Cabinet of Ministers of Ukraine. In particular, the Resolution of the Cabinet of Ministers of Ukraine of 01.06.2011 No. 869167 “On Approval of the Uniform Approach to the Generation of Tariffs for Housing and Utility Services” approves:

● Procedure for setting the tariffs for thermal energy, its generation, transportation and supply, services on district heating and hot water supply;

167 Resolution of the Cabinet of Ministers of Ukraine of 01.06.2011 No. 869 “On Ensuring the Uniform Approach to the Generation of Tariffs for the Housing and Utility Services”. – Available at: http://zakon4.rada.gov.ua/laws/show/869-2011-%D0%BF.
● Procedure for setting the tariffs for centralized water supply and sewerage;
● Procedure for setting the tariffs for services of maintenance of buildings, structures and adjacent areas;
● Procedure for calculation of the retail tariff for electricity;
● Procedure for setting the retail prices for natural gas for households.

Contractors/producers make calculations of economically justified costs for production (provision) of housing and utility services and submit them to the bodies authorized to set the tariffs.

In their tariff calculations, contractors/producers should take into consideration:

● Costs connected with production and provision of services;
● Investment requirements;
● Expected income from the services;
● Remoteness of various consumers from the place of production of the services;
● Quality compliance with the needs of consumers;
● Public grants and other forms of state support.

Economically justified costs of production (provision) of housing and utility services include investment component – the costs for compensation of investment resources received under investment programs, as well as their value.

The size of the investment component of the price/tariff is approved by the body authorized to set the prices/tariffs.

If during the period of application of the prices/tariffs any of the components of the economically justified costs is changed for reasons outside the control of the contractor/producer, for example, increase or decrease of taxes and duties, minimum wage, lease payments and depreciation charges, increase or decrease of prices for fuel and energy, as well as other material resources, contractors/producers adjust the prices/tariffs set for the housing and utility services and submit them for approval to the body authorized to set these prices/tariffs. The prices/tariffs may be recalculated through the adjustment of individual components within the structure of prices/tariffs that underwent price increase or decrease. In the course of adjustment, an additional factor to be considered is the compensation of losses (or withdrawal of unreasonably received income) resulting from application of the price/tariff that was not adjusted for the change of the individual costs during the period before the adjusted prices/tariffs were set.

The body authorized to set the prices/tariffs must make a decision on adjustment of the tariffs no later than 10 days upon receipt of a relevant submission.

7.2. Housing subsidies and benefits

Housing subsidy is a non-repayable targeted social aid from the state to low-income families for payment for the housing and utility services. The subsidy is non-repayable and is not tied to or result in any change in the ownership for housing.

Housing benefit is a full or partial exemption from payment for housing and utility services set by the legislation for certain categories of citizens.

7.2.1. Overview of existing subsidies and benefits

The existing Ukrainian system of subsidies and benefits includes two components:

1. Cross subsidizing or differentiated tariffs for payment for housing and utility services for households and publicly funded, industrial and commercial consumers. In particular, the tariffs for publicly funded, industrial and commercial consumers are considerably higher than those for households. As a result, these consumers partially subsidize consumption of the housing and utility services by the households.

2. Direct support of the population via subsidies and discounts on payments for housing and utility services. As a rule, subsidies and benefits for payment for housing and utility services are available on a non-cash basis: a consumer pays a part of the service costs; the rest is compensated from the budget funds to the provider of the service.

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168 Grant is an additional payment from the State Budget for the purpose of balancing of the lower-level budgets; a type of subsidy. Grant is a non-repayable, non-reversible aid from the higher-level budget to the lower-level budget that does not have any targeted nature and is issued in case of the excess of expenditures over revenues.

169 Benefits in cash are received by privileged categories of citizens, who live in single-family houses heated by stoves, for purchases of liquefied gas, solid or liquid fuel for stoves.
The legal basis for the housing subsidy system in Ukraine is Article 48 of the Constitution of Ukraine\(^ {170} \) that guarantees the citizens’ right to proper living standards for them and their families, including sufficient amount of food, clothing and housing.

According to Article 2 of the Law of Ukraine “On Housing and Utility Services”,\(^ {171} \) one of the state policy principles for housing and utility services is social protection of low-income citizens. Article 30 of the Law introduces the principle of guarantee of social protection for the population with regard to payments for housing and utility services and higher growth of the population’s income over the increase of prices/tariffs for housing and utility services.

To ensure social protection of citizens, the Laws of Ukraine “On the State Budget” annually provide for the funds for subventions from the State Budget to local budgets, which, in turn, provide benefits and housing subsidies to households to pay for electricity, natural gas, heating, water supply and sewerage services, apartment rent (maintenance of buildings, structures and adjacent areas), removal of household solid and liquid waste, as well as purchase of solid and liquid fuel for stoves and liquefied gas. In particular, the State Budget subventions planned for 2015 for these purposes exceeded UAH 25.2 billion taking into account the significant growth of tariffs for housing and utility services.\(^ {172} \)

According to the State Statistics Service, almost UAH 1.735 billion was paid in 2014 from the State Budget in benefits and housing subsidies established by legislation for the households, including UAH 1.531 billion in the non-cash form for the businesses that provide housing and utility services and UAH 203.7 million in cash to the citizens to purchase liquefied gas, solid and liquid stove fuel.\(^ {173} \)

### 7.2.2. Legal grounds for receipt of subsidies

The legal grounds for receipt of housing subsidies are set by the “Regulation on the Procedure for Appointment and Provision of Subsidies to Households for Compensation of the Costs for Payment for Housing and Utility Services, Purchase of Liquefied Gas, Solid and Liquid Stove Fuel for Households” approved by the Resolution of the Cabinet of Ministers of Ukraine of 10.21.1995 No. 848\(^ {174} \) (Regulation No. 848) with changes introduced by the Resolution of the Cabinet of Ministers of Ukraine of 02.28.2015 No. 106.\(^ {175} \)

Award of subsidies and control of their targeted use is performed by structural units of local governments in charge of social protection of the population.

In accordance with Paragraph 2, Regulation No. 848 the right to receive targeted non-cash subsidy for compensation of the costs for payment for the housing and utility services, namely, for maintenance of housing and utilities, as well as cash subsidy for purchase of liquefied gas, solid and liquid fuel for household stoves (hereinafter – subsidy) have citizens, who live in a residential buildings, which belong to the state and public residential fund including dormitories – for rent payment, which belong to the private residential fund and residential-building cooperatives fund – for maintenance payment, which belong to the residential fund regardless the type of ownership – for payment for the housing and utility services, for purchase of liquefied gas, solid and liquid fuel for household stoves.

The subsidy for purchase of liquefied gas, solid and liquid fuel for household stoves is provided in cash if the residential premises are not provided with electricity, heat or gas supply for heating purposes.

The subsidies are awarded if there is a difference between the amount of payment for housing and utility services, liquefied gas, solid and liquid fuel for household stoves based on the social housing standard and social standards for the use of housing and utility services with consideration of the benefits provided in accordance with legislation and the mandatory percentage of payment set by the Cabinet of Ministers of Ukraine.

The social standards of housing and use of the housing and utility services are currently set by the Resolution of the Cabinet of Ministers of Ukraine of 08.06.2014 No. 409 “On Setting the State Social Standards in the Area of Housing and Utility Services”.\(^ {176} \)

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170 Constitution of Ukraine. – Available at: http://zakon2.rada.gov.ua/laws/show/254%D0%BA/96-%D0%88%D1%80.
173 Express Issue of 20.01.2015 No. 10/005.5 av-15, Tables 1.5, 1.9, 2.5. – Available at: http://www.ukrstat.gov.ua/.
176 Resolution of the Cabinet of Ministers of Ukraine of 06.08.2014 No. 409 “On Setting the State Social Standards in the Area of Housing and Utility Services”. – Available at: http://zakon3.rada.gov.ua/laws/show/409-2014-%D0%BF.
The subsidy is calculated based on the number of registered persons that actually live in the residential premises (building) who receive bills for the housing and utility services based on the average monthly aggregate income of these persons.

For the purpose of subsidies, the aggregate income is calculated based on the income received by the persons without taking into account the personal income tax as specified in the declaration on revenues and expenses of the persons who applied for the housing subsidy. The subsidies for the next period are based on the income reported to SFS, Pension Fund of Ukraine, social insurance funds, higher educational institutions, in accordance with the procedure set by Paragraph 13 of the Regulation No. 848, as well as the volumes of the state social aid paid by the local structural units in charge of the social protection of the population (except the share of the aid received in connection with the birth of a child, which is a single-time payment, and the share of the aid received in connection with adoption of a child, which is a single-time payment).

The subsidy for compensation of the costs for payment for housing and utility services is awarded for 12 months from the month of the application.

In order to receive a subsidy, a citizen – whose person is verified by a passport or a different document – submits the following documents to the structural unit of the social protection service at the place of his or her registration (place of residence for tenants):

- Application for the housing subsidy and declaration of income and expenses of the persons who apply for the housing subsidy based on the standard forms;
- Proof of income – as stipulated by Paragraph Three, Clause 12, Regulation No. 848;
- Housing Lease (Rent) Agreement (if any).

The amount of costs for payment of the housing and utility services, purchase of liquefied gas, solid and liquid fuel for household stoves with the provision of the housing subsidy is set by the Resolution of the Cabinet of Ministers of Ukraine of 07.27.1998 No. 1156.177

The costs connected with the compensation of additional costs for payment for utility services provided the increase of prices and tariffs for services are funded out of the subvention from the State Budget to the local budgets for provision of benefits and housing subsidies for the households for payment for electricity, natural gas, heating, water supply and sewerage, apartment rent (maintenance of buildings, structures and adjacent areas), removal of solid and liquid household waste.

7.2.3. Legal grounds for receipt of benefits

At the moment, the right to benefits for housing and utility services is set by ten laws of Ukraine for almost 50 categories of citizens. They include: war veterans, some categories of labor veterans, persons born in time of war, victims of the Nazi persecutions, victims of political reprisals in Ukraine, military employees and veterans of military service and law-enforcement agencies, citizens that suffered from the Chernobyl disaster, families with many children, etc.

Most of these categories of citizens receive a 50% discount on housing and utility services, some categories are entitled to a 100% discount (disabled war veterans and their families; persons that have special merits to the country; victims of the Nazi persecution). When the benefits are awarded, the income of these categories of consumers is not taken into account, while it is the main criterion for award of subsidies. To ensure social justice, the Government is currently considering the possibility of elimination of this gap.

The structural units of the local governments in charge of social protection make records on the categories of the beneficiaries, keep the Unified State Automated Register of Persons Eligible for Benefits178 (USARB), reconcile the lists of beneficiaries with the companies providing housing and utility services on a monthly basis.

To apply for the benefits, citizens must provide the documents that identify them and confirm their right to the benefits to the structural units in charge of social protection at their place of residence and the companies providing housing and utility services.

A person eligible to a specific benefit under several laws of Ukraine is included into the Register as a beneficiary under one of the Laws at the person’s choice.

The procedures for the use of housing and utility services by the citizens eligible for the benefits are set by the Resolution of the Cabinet of Ministers of Ukraine of 01.08.1996 No. 879.179

7.3. Overview of current tariffs

As previously stated, the tariffs for housing and utility services and the prices/tariffs on energy resources form the economic basis for introduction of the EPC mechanisms in Ukraine. One of the remaining barriers for investments into energy efficiency is the artificial understatement of prices/tariffs on energy resources for households practiced in the past years, as well as the existing system of cross subsidizing.

The long-term disregard for of economic laws in the management of the housing and utility sector caused its severe crisis, poor technical condition of the major part of fixed assets and chronic unprofitability. According to the sector statistics data, the sector’s businesses generated losses of UAH 3.0 billion in 2014. The highest losses were incurred by municipal heating companies – UAH 1.9 billion, as well as water and sewerage facilities – UAH 0.9 billion.180

It should be noted that the Ukrainian government sees improvement of the economic situation in the energy and housing and utility sectors as a priority. For that reason, a number of governmental decisions was passed in 2014 – 2015 in order to bring the prices and tariffs for energy resources and housing and utility services to the economically justified level. In particular, retail prices for natural gas181 and the tariffs for electricity supplied to households grew significantly, in line with the recent decisions with further gradual growth of these tariffs projected for 2015 – 2017.182

The growth of prices/tariffs for energy resources from 01.01.2010 through 06.01.2015 is shown Graphs 13 and 14.

Graph 13. Growth dynamics of the prices for natural gas for industry, public sector and other business entities and households during 01.01.2010 through 07.01.2015 (including VAT)

*Since 1 April 2015, the prices for natural gas for the households depends upon the consumption volumes: to 200 m³ per month – UAH 3,600, above – UAH 7,188.

Before 1 April 2015, the price for gas for household consumers was based on three indicators of the consumption volume.

179 Resolution of the Cabinet of Ministers of Ukraine of 01.08.1996 No. 879 “On Establishment of the Standards for Use of the Housing and Utility Services by the Citizens Eligible to Benefits”. – Available at: http://zakon0.rada.gov.ua/laws/show/879-96-%D0%BF.
181 NEURC Resolution of 03.03.2015 No. 583 “On Setting the Retail Prices for Natural Gas Used for Household Needs”. – Available at: http://www.nerc.gov.ua/index.php?id=14329.
At the moment, the Government understands that approximation of the prices/tariffs for energy resources and housing and utility services to the economically justified level requires simultaneous implementation of energy saving and energy efficiency improvement measures as the share of the costs for energy resources in the structure of tariffs is significant. In particular, the share of the energy in the production costs of thermal energy included into the tariffs for utility services of district heating and centralized hot water supply provided by heat supplying organizations is approximately 83.0%, in the tariffs for centralized water supply – 30.6%, and centralized sewerage – 27.77%.

7.3.1. Retail price for natural gas

In its Resolution dated 03.03.2015 No. 584, NEURC approved the price ceiling in effect as of 1 April 2015 for natural gas for business entities that produce thermal energy including block (module) boiler stations installed on roofs and in outbuildings (based on the volume of natural gas used for production and provision of heating and hot water supply services for households on condition that these entities keep metering and accounting of heat and hot water) including value added tax, duty on the approved tariff for natural gas in the form of targeted markup, transportation tariffs, distribution and supply of the natural gas at the regulated tariff at the level of UAH 2994.30 per 1,000 m$^3$.

For business entities that produce thermal energy for other categories of consumers, the price for natural gas is the same as for the industrial consumers and other business entities.

By its Resolution dated 28.05.15 No. 1628, NEURC set with the effect from 1 June 2015 the price ceiling for natural gas sold to industrial consumers and other business entities (without value added tax, duty on the approved tariff for natural gas in the form of targeted markup, transportation tariffs, distribution and supply of the natural gas at the regulated tariff) at the level of UAH 6,600.00 per 1,000 m$^3$.

By its Resolution dated 03.03.2015 No. 503-582, 586 NEURC set with the effect from 1 April 2015 the following tariffs (without VAT):

- General tariff for transportation of natural gas: UAH 656.20 per 1,000 m$^3$;
7.3.2. Electricity tariffs

Electricity tariffs effective as of 1 April 2015 for households are approved by the NEURC Resolution dated 26.02.2015 No. 220189 “On Setting Tariffs for Electricity Supplied to Households” (the tariffs are shown in Tables 3, 4, 5, 6, 7 of the Appendix). A specific feature of the Resolution is the regulator’s change of the volumes of electricity consumption by households that served as a basis for setting the tariffs. In particular, the minimum tariff is set if consumption is below 100 kW-hour (previously, 150 kW-hour), and the maximum tariff is for consumption over 600 kW-hour (previously, 800 kW-hour). In addition, some preferences have been eliminated in setting the tariff for the consumers who use electric ranges in their households.

Retail tariffs for electricity for the industry and other non-household consumers are revised by NEURC on a monthly basis and approved by its relevant decisions. In particular, the tariffs effective as of 07.01.2015 for the said category of consumers are approved by NEURC Resolution dated 06.25.2015 No. 1877190 and are depending upon the class of voltage as follows: Class 1 – 131.72 kop., Class 2 – 150.20 kop. (without VAT).

7.3.3. Tariffs for utility services

By its Resolution dated 03.31.2015 No. 1171 “On Setting Tariffs for Services of District Heating and Centralized Hot Water Supply Provided to Households by Business Entities Providing These Services”, NEURC set tariffs for 162 business entities operating on the basis of NEURC licenses.191

The tariffs for centralized water supply and sewerage for the companies operating on the basis of the licenses are shown on the NEURC website.192

It should be noted that the level of tariffs for heating, hot water supply, water supply and sewerage is different for different categories of consumers (households, publicly funded institutions, industry, commercial consumers) due to the difference in the production cost of each individual HUS company. Corresponding data on the tariffs according to the Ministry Regional Development, Construction and the Housing and Utility Sector are shown in Tables 8, 9, 10 of the Appendix. It should be noted that the tariffs set by the companies do not always cover the actual costs of HUS companies for production and provision of services, which impacts their economic condition and investment attractiveness.

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188 NEURC Resolution of 03.03.2015 No. 583 “On Setting the Retail Prices for Natural Gas Used for the Needs of Households”. – Available at: http://zakon4.rada.gov.ua/laws/show/z0242-15.


190 NEURC Resolution of 25.06.2015 No. 1877 “On Setting the Retail Tariffs for Electricity as of July 2015 Taking into Account the Boundary Levels with Gradual Transition to the Generation of Unified Retail Tariffs for the Consumers in Ukraine”. – Available at: http://www.nerc.gov.ua/?id=16443.


192 Tariffs for centralized water supply and sewerage. – Available at: http://www.nerc.gov.ua/?id=14684.
VIII. ESCO EXPERIENCE
8.1. Ukraine

The legislative basis for use of energy service mechanisms in Ukraine was not created until 2015, when the Law No. 327-VIII dated 09.04.2015 and the Law No. 328-VIII dated 09.04.2015 were adopted. However, the market of energy service in the country began developing back in the mid-90s when industrial companies first became interested in reduction of energy consumption. This market consisted of small regional companies oriented on energy saving that were established in 1996 – 1997 with the support of USAID.

The first Ukrainian ESCO – ESCO-East – was established in Zaporizhia. Later, ESCO-West, ESCO-South, ESCO-Donbass, ESCO-Kharkiv and ESCO-Center were established. As a rule, these companies were small enthusiastic engineering firms oriented to Ukrainian industrial enterprises that required professional consulting assistance for reduction of energy costs. In 1998, the state-owned UkrESCO was established as part of implementation of the loan agreement between Ukraine and EBRD.

In 1999 the Association of Energy Service Companies of Ukraine was created to organize cooperation between private ESCOs, the state, bank institutions and businesses. Over time, it combined 37 companies. Despite a good start and several successful projects, it did not exist long and was terminated 5 years later by general consent of the founders.

The privatization of industrial and energy companies in 2000 – 2005 contributed to increased interest in the energy efficiency projects on the part of owners and investors, which, in turn, contributed to development of ESCO business.

Although the actual volume of business did not increase significantly, the quality of the projects changed. As opposed to the initial stage, dominated by low-cost projects, more capital-intensive medium-term projects appeared. ESCO contracts grew in price and their number increased. This period can be seen as the inception of the true energy saving market.

The market development was also caused by increased pragmatism and demands of the clients to the results of work. During that period, the natural selection process began on the ESCO market. A number of companies went bankrupt and small ESCOs started merging into larger companies. This increased competition among ESCOs caused the situation when small and weak companies lost their independence or left the market. The total number of such ESCOs in 2005 in Ukraine was 30 – 40.

Due to the growth of prices for energy resources and tariffs in 2005 – 2008, the demand for energy services increased. During that period, the number of ESCOs grew to 70 – 80 and the total value of the energy efficiency improvement projects exceeded several million US Dollars. The largest projects were implemented in the energy-intensive sectors of the economy (metallurgy and mining industry, food and chemical industry, buildings and public sector).

The world financial crisis of 2008 – 2010 caused termination of many projects and destroyed the growing market of energy services in Ukraine. During that period, large and medium projects were stopped, investors’ money left the country, construction of thousands of buildings ended and the energy efficiency projects were frozen or terminated.

As a result, many companies including ESCOs went bankrupt. In 2010, the number of ESCOs that survived the crisis did not exceed 20.

In the recent years, the market of energy service was under transformation with the emphasis shifting from industry to municipal energy and civil construction. Due to manifold growth of prices for natural gas and heating tariffs, the demand for ESCO services starts growing.

At the same time, this business has not yet become significantly developed in Ukraine due to a number of barriers that restrict the demand for energy service. In particular, the survey of energy service companies operating in Ukraine indicated the following key barriers:

✔ **Political** – lack of a clearly defined energy policy of the state, including that in the area of energy efficiency. The goals and indicators declared in the relevant executive directives on improvement of energy efficiency during the previous years remained unfulfilled due to the lack of the political will and relevant financial support of the planned activities (Editor’s note: The updated Draft Energy Strategy of Ukraine for the period until 2035 has not been approved yet). In addition, excessive bureaucracy of the decision-making procedures with regard to implementation of energy efficiency projects, corruption factors and inefficiency of the court system in protecting the legal rights and interests of the project participants have a negative effect;


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- **Legislative** – deficient legislation in the area of energy efficiency and energy saving. Lack of legislative regulation of the framework conditions for implementation of energy service contracts, primarily, in the public sector (Editor’s note: At the moment, this issue is partly resolved as implementation of the adopted laws requires additional approval of a number of by-laws);
- **Economic** – lack of necessary economic incentives for implementation of energy efficiency measures, as well as lack of attractive investment environment;
- **Financial** – lack of proper financial support for the state programs of energy efficiency improvement by the central and local government authorities; restricted access of potential energy service customers to the financial resources for development and implementation of energy efficiency projects due to the high loan interest rates set by banking institutions; lack of possibilities to insure against risks in the course of implementation of the projects;
- **Informational** – insufficient awareness of potential energy service customers regarding the opportunities and economic feasibility of the mechanisms of energy service contracts.

Despite the difficulties and barriers, Ukrainian energy service companies acquired positive noteworthy experience in the recent years. In particular, *UkrESCO PrJSC* and *CE KyivESCO* have success stories of implementation of energy efficiency projects using the funds of international financial organizations. New approaches to implementation of the projects using international credit resources are being studied at the moment by CE DMESCO. Taking into consideration the priority status of energy efficiency improvement in the housing sector, special attention should be paid to the experience of *ESCO-CENTER LLC* and *ESCO Lutsk Communal Systems LLC* that implemented relevant projects in multi-family buildings.

### 8.1.1. UkrESCO PrJSC

Private Joint-Stock Company *Ukrainian Energy Saving Service Company*[^195] (*UkrESCO PrJSC/UkrESCO*) was founded in 1998 in pursuance of the Resolution of the Government of Ukraine[^196] in accordance with the resolution of the Founding Meeting of Shareholders of *UkrESCO* (the participatory share of the state in the charter capital of *UkrESCO* is over 99%).

The main activity area of *UkrESCO* is the turnkey implementation of energy saving projects at the enterprises of Ukraine. Funding for all projects was provided out of EBRD funds in accordance with the Loan Agreements between EBRD and Ukraine ratified by the Laws of Ukraine, namely: “Funding for *UkrESCO*” of 13.05.1998[^197] (the first stage was successfully completed on 01.05.2007) and “Funding for *UkrESCO* (the second stage)” of 21.10.2005.[^198]

*UkrESCO* commenced its work in 1999. Since 2000, *UkrESCO* has successfully implemented 36 “turnkey” energy saving projects for the total value of about USD 31.8 million using the EBRD funds. The values of individual projects are USD 200,000 – USD 5,000,000, payback period: 1 – 4 years, term of commodity credit: to 4 years. Implementation of such projects made it possible for the companies to reduce the costs for energy resources by 25 – 50%, which allows achieving the saving in money terms of about USD 13.7 million a year. All *UkrESCO* projects are environmentally safe.

The conditions for implementation of the project and attraction of funding include confirmed solvency of the customer’s company and provision of the security of the fulfillment of the company’s obligations: (a) pledge (mortgage) of at least 25% of the project cost, or (b) unconditional irrevocable bank guarantee of at least 100% of the project cost.

For the purposes of implementation of the projects, *UkrESCO* developed and introduced a package of necessary agreements including:

1. Protocol of Intent – at the stage of initiation of the project;
2. Project Development Agreement (PDA) – at the stage of the project development;
3. Package of agreements on implementation of the project including:
   - Agreement for provision of energy saving services regulating the relations at the stage of preparation of technical specifications, tendering for procurement of equipment and works, commissioning and monitoring of the achieved specific or direct economy;

[^195]: Website of UkrESCO PrJSC. – Available at: http://www.ukresco.com/aboutus.html.
[^196]: Resolution of the Cabinet of Ministers of Ukraine No.1422 dated 20.12.1997. Available at: http://kodeksy.com.ua/norm_akt/source-%D0%9A%D0%9C%D0%A3?type-%D0%88%D0%BE%D1%81%D1%82%D0%B0%D0%BE%D0%82%D0%BD%1422-97-%D0%BF-20.12.1997.htm.
- Sale and purchase agreement with the deferral of payments until the commissioning and payments by installments for the period equal or exceeding the project's payback period at the expense of energy saving;
- Agreements or other instruments to secure the monetary obligations of the project's customer to UkrESCO.

In addition, UkrESCO performs energy audits of the companies, including those of the investment class.

UkrESCO provided services to companies representing machine-building, chemical, food, construction and agricultural sectors in various regions of Ukraine (Crimea, Dnipropetrovsk, Donetsk, Vinnytsia, Ivano-Frankivsk, Kyiv, Mykolaiv, Sumy, Kharkiv, and Kherson Oblasts), among which: Voznesensk Leather Association VOZCO CJSC, Kupyansk Dairy Plant CJSC, Shostka City Dairy Plant OJSC, Hostomel Glass Factory OJSC, Crimean Titanium CJSC, Oril-Lider CJSC, AVK Confectionary Plant CJSC in Dnipropetrovsk, CeramicBudService LLC, SE Askaniyske Research Company of the Institute of Oil Crops of the Ukrainian Academy of Sciences, as well as schools and kindergartens of Sniatyn Ration, Ivano-Frankivsk Oblast, etc.

As part of its projects, UkrESCO implemented construction of cogeneration plants, modernization of heating systems, modernization of the systems for production and distribution of compressed air, modernization of certain types of technological equipment, launched production of heat insulation materials (glass foam), introduced the use of renewable fuels (biomass) at the boiler stations, as well as heat modernization of buildings.

8.1.2. Communal Enterprise “Project Implementation Group” (KyivESCO)

KyivESCO Communal Enterprise (KyivESCO CE) was originally established as the Communal Enterprise “Project Implementation Group” in 1999 for implementation of the International Investment project of the World Bank for Reconstruction and Development – Energy Saving in Administrative and Public Buildings of Kyiv. The project was developed for the purpose of implementation of the state comprehensive program of energy saving in administrative and public buildings of Kyiv that are funded by the city budget and aimed at the significant reduction of budget expenditures for heating supply due to implementation of energy saving measures with the short payback periods.

The total cost of project was about USD 27 million including:
- Loan of the World Bank for Reconstruction and Development (WBPP) – USD 15.18 million with the maturity period of 12 years, including 6-year preferential period;
- Internal funding from Kyiv City State Administration – USD 9.9 million;

199 Website of PMG CE (KyivESCO). – Available at: http://kyivesko.com.ua/pro-nas/istoriya.
Grant of the Swedish International Development Agency (SIDA) – USD 2 million (consulting services of leading Swedish companies).

In the course of project implementation, the following activities were carried out:

- 1,560 energy audits of publicly funded institutions and design works on reconstruction of the heating systems with installation of the modular individual heating units;
- Installation of commercial equipment for metering of thermal energy in 1,357 buildings, which allowed making calculations based on actual consumption of heat;

Graph 16. Reduction of thermal energy consumption by publicly funded institutions

Graph 17. Structure of the system of remote control and commercial accounting of energy consumption
• Installation of 1,173 modular individual heating units equipped with the automatic regulation systems and pumping equipment, which allowed optimal consumption of thermal energy by the heating systems in the buildings;
• Installation of reflectors at the radiators in 940 buildings (2,478,583 linear meters);
• Sealing of windows and doors in 1,270 buildings (2,478,583 linear meters);
• Modernization of the system of mixing hot water at 14 healthcare institutions (3,727 mixers) and 260 preschool institutions (2,054 mixers);
• Replacement of 400 blocking valves at 200 institutions;
• Replacement of non-repairable 254 windows with modern insulated and soundproof windows of metal and plastic (total area: 1,414 m²).

Implementation of energy saving measures (as part of the project) allowed to reduce consumption of thermal energy by publicly funded institutions almost by 34% (from 1,206,000 GCal in 2001 to 798,000 GCal in 2012), repaying the loan and reducing the local budget expenditures for heating. According to the WBRD Final Report (Report 33154-UA) the performance of CE KyivESCO received the highest rating.

In addition, a pilot project was implemented in 2007 – 2008 to create a system of remote control and commercial metering of energy consumption by publicly funded buildings that covered about 130 educational and healthcare institutions. Implementation of the project (Graph 17) allowed to provide information/analytical and technological support of the generation of statistic reports, preparation of analytical materials, analysis of indicators and management of energy efficiency of publicly funded facilities in the city of Kyiv.

With the technical support of the Municipal Heating Reform Project (MHR) implemented under financial support of USAID, a significant volume of works was conducted in 2011 – 2013 in Kyiv in order to achieve positive systematic changes in the heating sector, particularly:

• Development of the Kyiv Municipal Energy Plan that defines the ways of resolving the local energy problems based on their rational vision and which became a main part of the future SEAP;
• Organization of the multi-component information campaign that envisaged awareness raising work among residents with regard to the efficient energy consumption;
• Assistance in development of ABCOAs, creation of advisory bodies and ABCOA support centers;
• Implementation of pilot projects (Graph 16) on heat renovation of two publicly funded institutions: Preschool Educational Institution (PEI) No.573 located at 27g Marshala Malynovskoho Str., Obolonsky District, Kyiv, and General Education Institution No.233 located at 22a Layosha Gavro Str., Obolonsky District, Kyiv, total value: UAH 14.9 million (Kyiv City State Administration – UAH 9 million, USAID Project – UAH 2.9 million, DTEK – UAH 3 million).

For the purposes of funding of the project of energy saving in publicly funded institutions of Kyiv that provides for replacement, repair, installment of energy efficient equipment at municipal property, CE KyivESCO obtained a permit based on the Decision of Kyiv City Council dated 10.02.2013 No. 12/9600 for receipt of the loan against municipal guarantees in the amount of UAH 4 million for 5 years at 3% per annum from the Nordic Environmental Finance Corporation (NEFCO).

In addition, based on the Decision of Kyiv City Council dated 10.02.2013 No.13/9601, CE KyivESCO also obtained a permit to receive a NEFCO loan against the municipal guarantees in the amount of EUR 5 million for 8 years at 7% per annum for funding of the Project “Thermal modernization of Publicly Funded Institutions in Kyiv”.

Understanding the progressive nature and efficiency of the ESCO mechanism for attraction of credit funds into the area of energy efficiency, and in the absence of a legal basis for implementation of energy service contracts at the national level, CE KyivESCO initiated implementation of such a mechanism in 2012 in Kyiv using existing legislation. In particular, a relevant procedure for implementation of the ESCO mechanism in the public sector of Kyiv was developed as a result of the fruitful cooperation of the structural units of Kyiv City State Administration, KyivESCO CE, MHR Project and the Institute of Budget and Socioeconomic Research.

### 8.1.3. CE DMESCO

Communal Enterprise “Dnipropetrovsk Municipal Energy Service Company” (CE DMESCO) was established in 2006 to develop and manage projects of municipal energy saving for reduction of energy costs at publicly funded organizations and municipal companies.
The main tasks of the company include:

- Defining energy saving potential and preparation of feasibility studies for municipal energy saving programs and individual projects;
- Development of proposals for improvement of economic stimulation of energy saving in the publicly funded, housing and utilities and industrial sectors of Dnipropetrovsk;
- As part of cooperation with EBRD, attraction of investments for implementation of the Project “Energy efficiency Improvement of Public Buildings”;
- Search for and attraction of investment resources for implementation of energy saving projects;
- Provision of consulting services on energy saving.


In 2010, CE DMESCO started developing a joint project with joint implementation of the mechanism of Energy Performance Contract and development of ESCO in Ukraine. For that purpose, CE DMESCO entered into a relevant investment agreement with EBRD in 2012.

The model of implementation of the project requires implementation of a set of self-supporting energy efficiency measures in the buildings of publicly funded institutions (educational institutions) using the EPC mechanism with guaranteed savings. The main goal of the project is to reduce consumption or increase efficiency of use of energy resources (electricity, heat, etc.) and reduction of relevant budget expenditures for maintenance of publicly funded institutions in Dnipropetrovsk. It is expected that the planned level of savings of the heat and electricity as a result of implementation of energy saving measures at the sites will reach 40%.
The project is implemented on a co-funding basis including:

- EBRD loan against the municipal guarantee: up to EUR 20 million;
- E5P investment grant: EUR 2.5 million;
- Dnipropetrovsk city budget: EUR 3.4 million;
- Funds of private investors.

**CE DMESCO** is a borrower of credit funds, manages the project and acts as the customer of the works. Also, the delivery of works and services under the project requires attraction of funds from private ESCOs to be selected in accordance with EBRD rules. Payments for the works and services of private ESCOs will be made after implementation of energy saving measures and achievement of the planned savings. The risks of non-achievement of the planned level of economy is borne by the private ESCO.

For the first stage of the project, 84 buildings (schools) have been preliminarily selected. For the purpose of implementation of the project, **CE DMESCO** entered into the agreement with EBRD on 12.13.2013 for the loan against municipal guarantees in the amount of EUR 10 million for the period up to 10 years at 5.25% per annum.

Currently, **CE DMESCO** is in the process of selection of contractors on a competitive basis.

### 8.1.4. Central Energy Service Company LLC – ESCO-CENTER

In 2008, Central Energy Service Company LLC – **ESCO-CENTER (ESCO-CENTER LLC)** was the first in Ukraine to develop and implement a project of energy efficiency improvement of a multi-family building using the mechanism of energy service contracting in the city of Nizhyn, Chernihiv Oblast, at 23 Nezalezhnosti Str. This 5-storey building of 150 apartments and the total heated area of 7,057.1 m² was built in 1980 based on the typical design of ceramsite and concrete panels (Graph 17).

In the course of preparation and implementation of the project, **ESCO-CENTER LLC** had to resolve a series of organizational problems dealing with:

- Selection of the optimal business model;
- Determining the conditions for funding of the project using the credit funds from the Dutch DIGH Fund;
- Support of residents in establishing an ABCOA;
- Receipt of support (including financial support) from Nizhyn City Council;
- Entry into the agreement with the local district heating company for supply of thermal energy to the building.

The model used in the project was the Full Management Contract, Type 2, under which **ESCO-CENTER LLC** entered into the agreement with ABCOA for provision of the heating and hot water supply services, as well as ensuring comfortable conditions in the building along with the fulfillment of the obligations to enhance energy efficiency. Also, as **ESCO-CENTER LLC** took a role of the managing company, it:

- Selected contractors for individual works;
- Supervised the project implementation;
Provided heating and hot water supply services to the residents by purchasing heat from the local heating company;
- Kept accounting of heat consumption;
- Collected payments from the residents for the heating services;
- Reported to the creditors on the use and repayment of borrowed funds;
- Reported to the ABCOA for the quality of works and services.

The project’s attractiveness for the residents was ensured by the following:
- Payments for heating and district hot water (DHW) for the residents were at the level of the tariff set in the city of Nizhyn with a 3% discount;
- Preservation of subsidies and benefits for the residents;
- The property and apartments are not used as a collateral for the borrowed funds;
- Preservation of the district heating system in the building;
- Guarantee of repayment of the loan due to reduction of consumption of the thermal energy.

The total cost of the project in 2008 prices was UAH 2,400,000, including UAH 1,975,000 of the DIGH loan and UAH 425,000 of the co-funding from the State Budget. In the course of the project implementation, a set of measures for improvement of energy efficiency were performed in the building: roof repair and heat insulation of the walls, installation of the individual heating unit (IHU), hydro-chemical cleaning and balancing of the internal heating system in the building, insulation of the entrance lobby and replacement of windows in the hallways, which allowed to improve the building’s energy efficiency level to a significant extent (Table 2, Graph 20, Graph 21).

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Before thermal modernization</th>
<th>After thermal modernization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual consumption of thermal energy for heating (based on meter readings)</td>
<td>996 GCal</td>
<td>619 GCal</td>
</tr>
<tr>
<td>Heat conductivity of the building envelope:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>1.68 W/m²°C</td>
<td>0.34 W/m²°C</td>
</tr>
<tr>
<td>Attic floor</td>
<td>0.89 W/m²°C</td>
<td>0.44 W/m²°C</td>
</tr>
<tr>
<td>Basement ceiling</td>
<td>0.96 W/m²°C</td>
<td>0.96 W/m²°C</td>
</tr>
<tr>
<td>Windows</td>
<td>3.1 W/m²°C</td>
<td>1.7 W/m²°C</td>
</tr>
</tbody>
</table>

Table 2. Energy characteristics of the building

As a result of the implemented measures, the consumption of thermal energy for heating was reduced by 40% on the average, its operational characteristics were considerably improved and so was the comfort for the residents.
8.1.5. ESCO Lutsk Communal Systems LLC

In 2010, ESCO Lutsk Communal Systems LLC developed and implemented a project for energy efficiency improvement of a multi-family building in Lutsk, Volyn Oblast, at 10 Peremohy Str. (a 9-storey building with 144 apartments and the total residential area of 8,412 m² built in 1978).

For this project, the Full Management Contract, Type 2, was used, under which ESCO Lutsk Communal Systems LLC became the provider of heating services for the building.

Similarly to the Nizhyn project, the complexity for the contractor was in combining the interests and finding mutually beneficial conditions for the residents, the private investor, a local heating organization and ESCO Lutsk Communal Systems LLC itself.

The main motivation factors for obtaining the residents’ support were:

- Guaranteed preservation of the ownership right to the apartments;
- Keeping the heating tariff 7% lower than the standard city tariff;
- Significant improvement of the comfort for residents;
- Increase of the market value of apartments in the reconstructed building;
- Implementation of the project did not require additional co-financing by the residents.

In the course of implementation of the project (total cost: almost UAH 2,106,000), the following works were performed: heat insulation of the building envelope, assembly and putting IHU into operation, installation of the metal and plastic energy saving windows in common areas, as well as other necessary repair and construction works, which allowed to reduce consumption of thermal energy for heating by 50% (Graph 22). According to the project’s conditions, the investment will be repaid due to the reduction of consumption of thermal energy.
Analysis of the experience of ESCO-CENTER LLC and ESCO Lutsk Communal Systems LLC proves realistic possibilities of successful application of the Energy Service Contracting mechanisms for the projects of energy efficiency improvement of multi-family buildings, which is critical for Ukraine. At the same time, the state has to take additional measures to improve solvency of citizens, as well as their responsibility for non-payment of the housing and utility services consumed. In addition, the relations between municipal heating companies and ESCOs required further legislation regulation for the cases when ESCOs are selected as providers of heating services for multi-family buildings.

8.2. Energy service companies in the Russian Federation

At the current stage of development of the Russian economy, it may be defined as extremely energy-intensive and inefficient from the energy standpoint. This is caused primarily by the technological backwardness and structure of the industry and of the housing and utility sector as well as peculiarities of the state pricing and tariff policy.

In 2009, Federal Law No.261-ФЗ “On Energy Saving and Improvement of Energy Efficiency and Amendments to Individual Legislative Acts of the Russian Federation” (the Law “On Energy Saving”) was adopted and created conditions for establishment of the new type of relations in the area of energy saving and improvement of energy efficiency.

Implementation of the Law “On Energy Saving” forms a conceptually new basis for development of energy service business and ESCO activities. What used to be single cases, have now become a priority for the state policy outlined in the normative and legal framework.

In particular, the Energy Strategy of Russia until 2030 set the achievement of energy efficiency of the economy and formation of the energy service market, as well as creation of relevant regulatory, legal and institutional conditions for ESCO activities as the top-priority areas of RF’s state policy in the energy sector.

At the moment, the expert portal on energy saving – State Information System in the Area of Energy Saving and Improvement of Energy Efficiency contains data on 76 ESCOs, of which one third is located in Moscow and Moscow Oblast.

In addition, the Russian Association of Energy Service Companies was established in March 2014. Until that, organizations providing energy services were not members of any associations, unions or self-regulated organizations. The exception was the companies engaged in energy audit as legislation allowed energy audits to be performed exclusively by the organizations that are members of self-regulated organizations in the area of energy auditing. According to the data of RF’s Ministry of Energy as of May 2014, the number of self-regulated organizations in the area of energy audit was 157.

8.2.1. Legal framework for Energy Service Contracts

The fundamental special law in the area of ESC is the above Federal Law “On Energy Saving and Improvement of Energy Efficiency and Amendments to Some Legislative Acts of the Russian Federation” of 23 November 2009 No.261-ФЗ that regulates the relations with regard to energy saving and improvement of energy efficiency. The Law sets legal, economic and organizational grounds for stimulation of energy saving and improvement of energy efficiency. In addition, the Law provides for a possibility to enter into ESC as the main legal tool of ESCO. In particular, the Law contains a separate Chapter 5 “Energy Service Agreements (Contracts) and Agreements of Sale and Purchase, Supply, Transfer of Energy Resources that Include ESC Terms. The Chapter provides for the requirements to such agreements (contracts), as well as their terms and conditions. In addition, it is expected that state or municipal ESCs (contracts) are concluded to address the state and municipal needs in compliance with RF’s legislation on budgeting and placement of orders.

204 State Information System in the Area of Energy Saving and Improvement of Energy Efficiency. – Available at: http://gisee.ru/.
207 It should be noted that the provisions of the Law do not contain any significant financial incentives for the managers of companies and organizations to develop ESC as a mechanism for attraction of extrabudget resources.
Also, ESCO activities and conclusion of ESCs are regulated by the following special regulatory acts:

- **Budget Code of the Russian Federation** dated 31.07.1998 No.145-ФЗ (particularly, Article 72 stipulates the right of the state and municipal customers to enter into the state or municipal ESCs. This provision allows entering into long-term ESCs for the periods exceeding the budget year, as well as paying on the ESCs under the same line item as the utility services;)
- **Federal Law “On Technical Regulation”** of 27.12.2002 N.184-ФЗ exercising technical regulation in the area of application of energy efficiency requirements;
- **Federal Law “On Self-Regulated Organizations”** dated 01.12.2007 No.315-ФЗ regulating the general rules on creation and functioning of self-regulated organizations;
- **Federal Law “On Non-Commercial Organizations”** dated 12.01.1996 No.7-ФЗ;
- **Order of the Russian Ministry of Energy “On Approval of the Procedure for the Conclusion and the Material Terms and Conditions of the Agreement Regulating the Terms of Installation, Replacement and/or Operation of the Equipment for Metering of the Energy Resources Consumed”** dated 07.04.2010 No.149;
- **And others.**

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208 RF Budget Code, Article 72, Clause 3: State-owned or municipal customers are entitled to enter into state or municipal energy service agreement (contracts) with the price set as a percentage of the saved energy resources for the term that exceeds the terms of the approved limits of budget obligations. The costs for payment for such agreements (contracts) are planned and paid as part of the costs for payment for relevant energy resources (energy supply services). – Available at: http://www.consultant.ru/popular/budget/.  
8.2.2. ESCО operating principle

A determining characteristic of ESCО in the Russian Federation, as well as in other countries, is the fact that it receives payments as a result of savings from energy projects depending on their profitability.

In the Russian market, ESCOs can provide both one-time services (consulting, supply of equipment, development of energy efficiency improvement measures, etc.), and comprehensive services (including preparation and implementation of “turnkey” projects).

However, the traditional basis for the energy service industry is the provision of comprehensive (“turnkey”) energy efficiency services including evaluation, development, assembly of equipment, funding, servicing and monitoring of actual savings within energy efficiency projects.

Article 19 of the Law “On Energy Saving” provides a definition of ESC as a contract where the subject matter is performance of the actions aimed at energy saving and improvement of energy efficiency in the use of energy resources by the customer.

Although the Russian Law “On Energy Saving” does not contain any direct reference to the savings achieved as a source of payments under the contract, the payment is made as a rule by the customer upon completion of the project out of the funds saved as a result of the implementation of energy saving technologies. Usually, ESCs are concluded for the period of 6 months to 5 – 7 years (the maximum term is restricted to the capability of Russian banks to provide ESCOs with long-term loans).

In addition, it should be noted that the Resolution of the Government of the Russian Federation “On Requirements to the Terms and Conditions of the Energy Service Contract and Specifics of Setting the Initial (Maximum) Price of the Energy Service Contract (Lot Price)” dated 18.08.2010 No.636 sets a requirement for ESCs to incorporate a provision, under which the amount of the payment is set as a percentage of the achieved saving of the customer’s relevant costs for energy resources in money terms at the prices (tariffs) for relevant energy resources effective for the period when the savings are achieved as stipulated in the contract that cover, among other costs, the contractor’s costs for implementation of the set of measures. Thus, increase in the tariffs is taken into account for the settlements with ESCO with indexation of the payments for the benefit of ESCO based on the year’s results.

An incentive for energy saving and energy efficiency improvement in the public sector is set by the Law “On Energy Saving” that states:

From 1 January 2010, key spending units plan budget allocations to ensure the performance of the functions of the public (budget-funded and autonomous) institutions under their supervision on the basis of the data on the resources consumed by public (budget-funded and autonomous) institutions in 2009 decreased in comparable terms by 15% during 5 years with annual decrease by 3%. Planning of the said budget allocations does not take into consideration the reduction of expenditures of the state (municipal) institution achieved as a result of reduction of the volume of actually consumed resources in excess of the level set in accordance with Part 1 of this Article. Savings of the funds achieved as a result of the additional consumption of resources by the public institution compared to the reduction taken into consideration in the course of planning of budget allocations shall be used in accordance with budget legislation of the Russian Federation to ensure the performance of the functions by the relevant institution including the increase of the annual payroll fund (without taking into account the said increase due to indexation of the payroll funds).

220 For instance, Resolution of 18.08.2010 No. 636 “On Requirements to the Terms and Conditions of the Energy Service Contract and Specifics of Setting the Initial (Maximum) Price of the Energy Service Contract (Lot Price)” envisages only one option for energy service funding – percentage of the achieved savings. – Available at: http://www.rg.ru/2010/12/14/energoservis-site-dok.html.


8.2.3. Model of interaction between ESCО and publicly funded institutions

Under Russian legislation, state-owned and municipal unitary enterprises are restricted as to the possibilities to dispose of their property, entry into transactions and attraction of borrowed funds.

Despite these barriers, however, it is possible to use ESC in the public sector. Therefore, civil legislation allows participation of municipal formations and unitary enterprises in civil relations. For instance, their relations with ESCО are based on the following principle (Graph 23):124

After the contract is concluded with a publicly funded institution, the works under this Structure are paid out of the replenishable fund for support of energy service works, which is funded and administered by the regional government and financial organizations. Upon completion of the works and confirmation of the economy, the bank that cooperates under the ESC program will reimburse ESCО's costs and pays the profit set in advance. The key spending unit (KSU) reduces the costs for the maintenance of the institution by the amount of saving leaving a part of the saved funds at the institution's disposal and reserving a part for compensation of the bank's costs. Out of the saved funds, ESCО repays the grant to the fund at the interest set for the risks.125

8.3. European market of energy services

Energy service markets in European countries are very diverse. Conventionally, they may be divided into 3 parts:

1. Well-developed energy service markets.
   This group consists of the energy service markets of such countries as: Germany, France, Great Britain, Austria, Italy, Sweden, Spain, the Netherlands, and Finland.

2. Moderately developed energy service markets.
   These may include energy service markets of: Belgium, Switzerland, the Czech Republic, Ireland, Greece, Romania, Bulgaria, and Poland.

3. Energy service markets at the initial stage of development.
   These are the energy service markets of other European countries including Ukraine.

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124 The scheme used was published at the Internet portal AEnergy.ru. – Available at: http://aenergy.ru.
125 Койнов І., Чуриков А. Механізми фінансування заходів з підвищення енергетичної ефективності в Росії: енергосервісні контракти // AEnergy.ru. – Available at: http://aenergy.ru/2571.
The degree of development of energy service is determined by the country’s national experience in the issues of energy efficiency improvement. On the way towards the development of energy service, each country has its own set of barriers and, therefore, forms its own regulatory framework. As a result, legal regulations of ESCO activities in European countries differ significantly. The countries with sufficient national legislation on energy efficiency improvement have a significant influence on the energy service development, while the countries that started resolving the issues of energy efficiency only upon approval of the EU directives have less developed energy service markets (Ukraine is one of them).

Developed European countries achieved significant energy economy as a result of the support of ESCO activities and development of EPC. In those countries, energy service measures provide for both one-time measures (for instance, establishment of one or several state-owned ESCOs) and comprehensive targeted programs that include implementation of pilot projects, broad dissemination of information and best practices, development of methodological recommendations and model contracts, etc. At the same time, some European countries only achieved minimal energy efficiency standards outlined in EU Directives.

Let us review the examples of well-developed energy service markets in European countries.

8.3.1. Energy service market in Germany

The key tasks of Germany’s policy in the area of energy saving and energy service are set in the Energy Concept of the Federal Government that provides for the reduction of the overall supply of primary energy by 20% from the level of 1990 by 2020 and by 80% by 2050.

8.3.1.1. Legal framework for Energy Service Contracts

German legislation motivates managing companies to invest their own or borrowed funds into energy saving in multi-family buildings by providing preferential terms or targeted subsidies (grants).

For the purpose of development of energy service, in addition to the law on the “green” tariff adopted back in 1992, a number of motivating regulatory documents were adopted. The main ones are:

1. **Law on Housing Tenants.** The law regulates proposals of preferential investments for tenants for modernization of housing;
2. **Antimonopoly Law.** Section IV changes the procedure for conclusion of contracts and improves its reliability;
3. **Law on Environmental Tax** – establishes new environmental laws;
4. **Law on Labeling of Energy Consumption** – motivates labeling of the energy consuming equipment;
5. **Energy Service Act (EDL-G)** – contributes to dissemination of energy service;
6. **Energy Saving Act (EnWG)** – sets the obligations for improvement of energy saving;
7. **Renewable Energy Act (EEG).** The document sets obligations for the use of renewable energy sources for heating supply for new buildings;
8. **Energy Saving Order (EnEV)** – supports energy saving;
9. **Contract Award Code** – improves reliability of contracts;
10. **Program of Incentives at the Heating Market** – provides incentives for promotion of renewable energy sources used for heating of buildings;
11. **Building Modernization Program** – reduces bank interest rates for funding of building modernization and supports different measures for motivation of the energy service development;
12. **Program of Energy Saving and Reduction of Greenhouse Gas Emissions** – supports comprehensive measures on energy saving depending on the volumes of reduction of CO₂ emission (minimum 40 kg per 1 sq m in a year). If energy consumption falls to a certain level up to 20% of the credit obligation of the managing company can be paid out of the grant. This approach is attractive both for the managing company and for the supplier of energy resources as the costs for servicing of one apartment will be much lower if many apartments are being services.

228 Проект по фінансуванню підвищення енергоефективності соціального житла (ФРЕШ). – Available at: http://www.fresh-project.eu/.
Most of EPCs in Germany are concluded in the public sector. Relevant legal framework has been formed for such contracts, namely:

1. Budgeting policy is regulated by federal law, particularly, a provision on division of the budget into operational costs and capital investments.
2. An important principle of “full coverage” is adopted. This means that all budget expenditures have to be matched with revenues from the implemented EPC.
3. When entering into EPCs based on attraction of the extra-budget financial resources, the cost-benefit assessment should be always made in comparison with direct budget expenditures.
4. In the budget sector, EPCs are supported only if direct budget funding of the project is less feasible economically than such EPCs.
5. EPCs are approved if the conditions set by public authorities are met. Also, the level of borrowings must be balanced with economic benefits from energy saving and ESCO expenses.

The measures for stimulation of energy service include agreements between the Federal Government and constituent state governments on the measures to be implemented in the buildings in order to reduce the greenhouse gas emissions (the so called Agreement 15 A-B). This Agreement is a legal basis for German federal states for entry into EPCs. It helps the government to speed up the approval procedure and increase the number of tenders for EPCs in the public sector.

In accordance with EU Directives on public procurement, the procedures of negotiated procurement or competitive dialog with bidders are envisaged for EPC awards. The main idea remains, however, that procurement of energy service requires significant time for preparation and implementation, and involves highly skilled specialists.

Application of EPCs is stimulated by the following factors:

- Strict compliance with obligations to reduce the greenhouse gas emissions;
- Recognition that EPCs are necessary to achieve the energy efficiency improvement goals;
- Political support, specifically on the local level;
- Strict requirements of state regulation to the producers of energy resources with regard to provision of energy services including reconstruction of the consumer’s buildings;
- Growth of prices for energy resources as a result of liberalization of the electricity market;
- Comprehensive approach to the requirements of reconstruction and construction of buildings, shifting the focus from the systems of energy supply for buildings to their structural elements;
- Public sector’s obligations on energy efficiency improvement and establishment of administrative structures in charge of organization, funding and implementation of measures for improvement of energy efficiency;
- Demonstration effect of the large number of municipal projects supported by energy agencies;
- Active support at the federal level and the level of federal states in the form of stimulation of investments, preparation of recommendations, standard procedures and documents, model contracts, models for setting the level of possible energy efficiency improvements;
- Assistance in preparation of energy service procurements by both national agencies and private consultants, which allowed for cases of successful implementation of similar ESCs;
- Use of the principle of pooling of projects within a single package of projects in order to reduce transaction costs;
- Willingness of financial institutions to invest into ESC;
- Quality standards (German DIN, recommendations of VDMA Industrial Association) that have a positive impact on legislative development;
- Availability of experienced and competent energy agencies with the mission to support energy services;
- Well-developed systems of measurement and verification based on the bills for the consumed energy, measuring equipment and coordinated baseline consumption of energy. This results in an insignificant number of lawsuits regarding the volume of energy saved.

Additional success factors in EPC application are:

- Favorable conditions for ESCO activities (reliable contracts, easy access to funding, attractive insurance, possibilities to obtain subsidies, etc.);
- Growth of energy prices causes raising awareness of consumers of the meaning of energy efficiency;
8.3.1.2. Current condition of energy service market

Adoption of a number of regulatory documents that stimulate development of the energy service market gave certain results. According to the expert evaluations, Germany has the most developed energy service market in Europe. Energy services are provided by more than 500 energy service companies or similar entities including both small and very powerful companies, former municipal enterprises and international companies. Most of the companies that provide energy services are members of associations engaged in provision of energy services. The most popular are the three associations connected with energy services:

- Energiecontracting, VFW (heating supply association);
- ESCO Forum (National Association of Companies of the Electrotechnical and Electronic Industry);

The total number of ESCs as of the beginning of 2007 exceeds 70,000. With this regard, the dynamics of provision of energy service is extensive: in the mid-1990s about 300 contracts of this kind were implemented mainly in the public sector.

Only in 2006, the investments within the framework of EPC amounted to EUR 750 million in Germany. In the public sector alone, the total potential of the energy service market in the country is estimated at EUR 2 billion, which corresponds to the energy saving potential of EUR 350 million a year.

8.3.1.3. Energy service models

The most common energy service models are Energy Supply Contracts (ESC). These contracts are similar to Energy Management Contracts (CEM) that are widely used in England, and energy resources and energy management contracts (Chauffage Contract) that are most common in France. In Germany, there are also many classical EPCs where the direct benefits from energy service measures are received by the facility owners who pay to ESCOs out of the saved funds.

It is quite common to form pools (packages) of sites within one EPC. In 2006, for instance, there was one EPC covering 13,000 facilities.

Recently, the Full Management Contract model that combined energy service with property management has become more common in Germany.

Most EPCs are concluded based on the model of distribution of the achieved savings with the guarantee of these savings (energy efficiency improvement guarantee) by the ESCO. As a rule, ESCO and its clients agree on distribution of the savings due to reduction of the operation costs in the proportion of 70% for ESCO and 30% for the customer. In the cases of considerable excess of the guaranteed level of energy efficiency improvement the savings are distributed in many cases as 50% for each party to the agreement. There is no “standard” distribution of savings. It depends on the value of the investment project, the duration of the contract and the risks undertaken by ESCO and the customer.

The ESC market is characterized by a large share of participation in funding of third party projects. In these cases, the sources of funding of energy service projects are the loans of commercial banks or state/municipal bonds. As a rule, the costs that are not connected with energy saving are incurred by the facility owners or covered by budget subsidies.

The average period of repayment of the funds under EPCs in Germany is 5 to 15 years. The municipal projects are concluded, as a rule, for longer periods.

In the industrial sector, short-term EPCs dominate with the duration about 3 years. These EPCs are concluded for the facilities that consume 0.2 to 2,000 MW-hour a year and ensure the energy efficiency improvement of 10% to 38%.

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229 International Institute of Sustainable Development. – Available at: http://www.iisd.org/.
World Energy Council. – Available at: http://www.worldenergy.org/.
International Financial Corporation. – Available at: http://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home.
8.3.1.4. Best practices of energy performance contracts

In Germany, many highly efficient EPCs with significant economic and environmental effect have been implemented. Among those, the following should be pointed out:

- Modernization of the University of Arts in Berlin.
- Energy saving in the buildings of UniCredit Group.
- Medical Center Bremerhaven-Reinkenheide.
- Brigittenau Swimming Pool.
- Implementation of the system of automation of buildings.
- Modernization of the Aulenbach Army Training Camp.
- Modernization of Diez Medical Coordination Center for the German Army.
- Modernization of the Jewish Museum Berlin.

As a result of implementation of these EPCs, the annual energy savings were 25% to 69%, the reduction of greenhouse gas emissions of 31% to 76%, and savings on building maintenance was EUR 236,000 to EUR 2,848,000 a year. These projects received a number of awards from the European Commission.

8.3.1.5. Barriers for development of energy services

The main barriers for development of energy service in Germany are:

- Hesitations of building owners as to the advisability of energy services based on their own evaluations;
- Lack of any distinct legislation on funding of energy services from energy saving;
- Ambiguity of the legislative provisions on distribution of costs between ESCO and tenants of the building;
- Lack of proper information.

In addition, there are the following obstacles for the development of the energy service market:

- Use of ESCO for energy efficiency solutions may cause reduction of the number of staff in publicly funded institutions. A need arises to adapt the employment policy, which slows the development of energy service; unwillingness of the industry to enter into long-term contracts and involve ESCOs, which may improve key production processes;
- Evaluation of risks by financial institutions and the risk of the customer’s default due to its insolvency. This problem may get deeper because of the lack of necessary skilled specialists and the customer’s know-how in the course of procurement of energy service;
- The need of trust between ESCO and the customer in order to properly measure and verify the results of energy saving;
- The procurement rules and budget legislation create barriers for the conclusion and implementation of the long-term ESCs;
- Perceptions of high transaction costs and increase of technical and economic risks, as well as the customer’s distrust to the complex negotiation process and complicated agreement.

8.3.2. Energy service market in Sweden

In Swedish energy service market, the ESC models are used that provide for renovation and modernization of buildings, introduction of additional energy services (for instance, modern lighting and air conditioning), sets of measures for re-equipment and replacement of fuels in the buildings that used to be heated with heating oil. A greater part of growth of the energy service market is connected with the projects of management of public property.

8.3.2.1. Legal frameworks of energy service contracts

Strategic Basis. The key principles of the country’s energy policy described in the “Agreement on Policy in the Energy Area” (1997) positioned energy efficiency as one of priorities of the country’s energy policy. Based on that Agreement, subsidies are planned for the measures aimed at reduction of electricity consumption (EP), development of district heating (DH), reconstruction of buildings with electric heating, and investments into solar energy.
For the purpose of implementation of the Agreement, the government adopted the following documents that influence the country’s policy in the areas of energy efficiency and energy service:

- Decisions to gradually reduce the use of nuclear power and transition to renewable energy sources (RES); implementation of measures in the areas of energy efficiency and energy services;
- Environmental restrictions in the area of further development of hydro-power resources;
- Obligations regarding reduction of greenhouse gas emissions under the Kyoto Protocol;
- New program of 2005 for elimination of the country’s dependence on fossil fuels by 2020.

Nevertheless, there is no special framework strategy or law on energy efficiency in the country. The legal framework of energy efficiency is mainly defined by the Law “On Planning and Construction” (1987), the Law “On Protection of the Environment” (1998) and the Environmental Code.

The Law “On Planning and Construction” provides a legal basis for the construction norms and rules including the energy efficiency requirements with regard to the buildings (put into effect at the end of 1970s and revised more than once). In fulfillment of the EU Directive on energy efficiency in buildings, necessary changes were introduced into Swedish legislation on energy certification of buildings in 2006 (the EU Directive was fully implemented by January 2009). The Environmental Code contains a number of provisions on regulation of energy consumption in the industry.

In order to achieve the goal of elimination of Sweden’s dependence on fossil fuels by 2020, the Government approved the National Program of Overcoming the Oil Dependence in October 2005. The Program is oriented towards RES and DH and provides for the fulfillment of the following key tasks:

- Introduction of additional benefits for replacement of the fossil fuels with RES;
- Increase of the volumes of energy produced out of RES in order to make renewable fuels the basis of the entire energy supply;
- Scientific research on RES;
- Ongoing investments into DH and financial incentives for the use of bio-fuels.

From 1970s, each municipality is obligated to have an annual and a long-term energy plan.

**Organizational Basis.** The Government's policy in the areas of energy efficiency and renewable energy sources (RES) has been supervised by the Ministry of Sustainable Development of Sweden (the Ministry) since 2005, when it undertook the functions in the areas of energy, energy efficiency and environmental problems. A number of executive authorities support the Ministry in the performance of its functions. The key organizations in charge of implementation of the measures of the energy saving policy in the country are the Swedish Energy Agency (STEM) and the Swedish State Electric Energy Company (Svenska Kraftnat). Besides them, a whole range of associations (both professional and commercial) are operating in the area of energy efficiency, RES and energy services. The most important ones are:

- Swedish Association of Electric Energy Companies (Swedenergy) engaged in implementation of projects and programs in the area of RES and efficient end consumption of EP;
- Swedish District Heating Association with 167 members supports the development of centralized supply of heating, cooling and cogeneration for the benefit of Swedish DH companies and their customers; today, the Association covers about 99% of all Swedish DH companies;
- Swedish District Heating Council (SweHeat) established by the leading companies and organizations for the purposes of international cooperation in the DH sector. The members of SweHeat are owners and operators of DH systems, research and scientific organizations, consultants and equipment suppliers that cover the entire spectrum of DH technologies. SweHeat’s activities are aimed at the development of DH, cogeneration and use of RES in the technological processes. The members of SweHeat have implemented many energy service projects in the energy efficiency area both within the country and internationally;
- Swedish Wind Energy Group, Swedish Bio-Energy Association and other associations specializing in support of different RES.

**Liberalization of the market of energy resources.** Upon liberalization of the electricity market in 1996, the trend for extension of commercial activities of the DH systems became noticeable in the country. This contributed to the structural reconstruction, which resulted in the reduction of the share of municipal heating companies. In 2005, the Law “On Centralized Heating Supply” was adopted that ensured oversight of the activities of private heating companies that are local monopolies, and entitled the consumers to negotiate the process and terms of delivery of the energy resources.
**Pricing for energy resources.** The goal of the reform on the electricity market was to give the consumers freedom of choice of the supplier and to create conditions for efficient pricing due to the open and better developed EP trade.

**Electricity prices** set by the suppliers for sales to end users consist of the electricity price itself, the price of EP “green certificates”, payments for the use of the grid and taxes (Energy Tax and VAT). The total EP price for the consumer that uses electricity for heating and has a termless contract for EP supply is estimated as follows: EP price – 36%, EP “green certificate” price – 3%, payment for the use of the grid – 19% (the Model for Evaluation of the System Productivity was developed to ensure reasonable levels of use of the grid) and Value-Added Tax – 42%. VAT is collected on the price of electricity at the rate of 25%. A consumer may influence the first two components of the total price through a proactive choice of the supplier of energy services and/or revision of the terms of the contract (in Ukraine, there is no real possibility so far to choose the supplier of energy resources due to the absence of the market of energy resource supplies).

**Stimulation in the area of RES.** In the 1990s, the country introduced a number of models for funding of EP production out of RES: investment subsidies were provided for production of EP out of biomass, wind energy and at small hydropower plants. At the moment, the following types of economic incentives are used: tax on CO₂ emissions or tax exemptions, “green certificates”, tax benefits, subsidies and grants. However, the subsidies are being gradually reduced and replaced with market mechanisms including those in the energy service sector.

**System of “green certificates”**. The system of certificates for EP was introduced in 2003 as part of the process of the transfer of funding programs from the state to the market. The purpose of the system was to increase the volumes of EP production out of RES by 10 TW-hour/year between 2001 and 2010 without taking into account the energy generated at the existing large hydropower plants. The certificates are issued for the EP generated with the use of the energy of the wind, solar energy, waves, peat, geothermal energy, some bio-fuels and hydropower. All EP consumers must obtain certificates in accordance with the shares of their electricity consumption. For instance, in 2004 “green certificates” had to reach 8.1% of energy consumption, and in 2010 – 16.9%. This figure keeps growing annually, which contributed to the development of the energy service market.

STEM and Svenska Kraftnat are in charge of the administrative management of the system of certificates for EP and direct it. In 2004 (the first year of the system’s functioning), 10 million EP certificates were sold. About 73% of the issued certificates were for the EP generation from biofuel, 19% – for the power generated at hydropower plants and 8% – for EP production using wind energy. In January 2006, the total number of EP certificates reached 30 million, and the volume of “green” electricity generated in 2005 (not including large hydropower plants) was 11.3 TW-hour.

In 2004, analysis of the system of EP certificates was held in the country. On its basis, the Ministry extended the term of “green certificates” in 2006 until 2030 and increased the planned RES shares in the EP production. Currently, the government’s task is to achieve production of 17 TW-hour by 2016.

**Environmental subsidies and grants.** For the country’s government, a priority sector is wind energy, and the targeted support in the form of environmental subsidy for EP generation using the wind energy is an addition to the system of “green certificates”. The highest subsidy is allocated for EP generation with the use of the wind energy in the coastline zone. It was planned to cancel this subsidy gradually. Recently, however, the decision was made to extend it for additional 5 years. The volume of annual funds is 70 million Swedish crowns. In addition, 30 million Swedish crowns with be allocated annually for development of the wind energy sector.

**Cogeneration and DH.** In Sweden, there is a policy of the support of utilization of energy that would be otherwise lost and that can only be used within DH systems. In the recent years, support has been provided for connection of buildings to CHPs and merging small DH networks. It is believed that DH is best used in the cities with population of 10,000 or more. DH covers 50% of the heat consumption market and is the main form of heating supply in city centers (in 232 out of 290 district municipalities). Sweden has about 200 DH companies, of which 67% are owned by municipalities. DH companies are being privatized at a growing rate. Often, they are bought by municipal electric energy companies. Cogeneration is implemented in 40% of DH systems, which is less than average in other countries where DH systems are well developed. It is expected that introduction of “green certificates” and implementation of the EU Directive on cogeneration will increase the CHP share in the centralized heating supply sector and improve the quality of energy services.

Thanks to the favorable taxation policy, the DH connected with the use of biomass and waste as fuel has a growing share in the energy consumption structure.

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230 The “green certificate” or certificate of electricity is a market product, which confirms that a certain amount of electricity was produced from renewable energy sources. Producers of electricity from renewable energy sources receive revenues from the sale of electricity certificates as well as from sales of electricity itself. An additional revenue from certificates helps to make such a generation of green electricity profitable for producers and thus foster new facilities of electricity generation from renewable sources. More at: http://nortrade.com/sectors/articles/norway-and-sweden-establish-green-certificate-market/.
Until now, no regulatory provisions were envisaged for the DH sector. However, increase of prices for DH within the last 5 years by 30% on the average caused the need to develop a new Law on District Heating to regulate the sector.

**Programs in the area of energy efficiency.** At the moment, a number of programs and projects is being implemented in the energy efficiency area, most of which are aimed at specific subsectors of the end consumption. The strategic program for the energy service market is the Energy Policy on Efficient Use of Energy. The Program provides for:

- Strengthening of municipal consulting services on energy efficiency in addition to the 13 Regional Energy Authorities. In all 290 Swedish municipalities, there will be energy efficiency consultants (~ 100 million Swedish crowns a year);
- Information, education in the energy area (~ 30 million Swedish crowns a year);
- Support of procurement and introduction of energy efficiency technologies (~ 60 million Swedish crowns a year);
- Testing, labeling and certification of energy consuming devices (~ 11 million Swedish crowns a year).

An important program for development of the energy service market is the **Program of Investments into Energy Efficiency of Public Buildings.** This Program is being implemented under the supervision of the district administrative councils and the National Board of Housing, Construction and Planning. The Program's budget amounts to 2 billion Swedish crowns. As part of the Program, funds are allocated for “energy mapping” (30%), energy saving and energy service measures, transition to electric heating or use of RES and DH. Maximum capital investment per one building is 10 million Swedish crowns.

**Program of Sustainable Development of Municipalities** is launched to support energy restructuring and creation of efficient energy service systems on the local level. The Program's participants are 5 different "model" municipalities that have relevant conditions for close cooperation with local business and industry communities. Other tasks of municipal development include improvement of energy consumption efficiency. STEM makes its conclusion by providing subsidies for research and participates in the activities performed by municipalities in the area of energy efficiency. This is done to make it possible to launch similar programs in other municipalities without dependence on state subsidies.

**Program of Energy Efficiency in Energy Intensive Industries** is a voluntary program controlled by STEM in cooperation with the Swedish Tax Authority and the Program Board, which includes representatives of different industry sectors. Exemption from payment of the energy tax on EP is the Program's main tool. Although the tax rate is not high for the industry, it is a heavy burden on the energy-intensive sectors of processing and, therefore, many companies express their interest in the Program. The Program is based on voluntary participation of the companies that have financial resources for implementation of the measures envisaged by the Program. As the companies join the Program, they take the following obligations:

- Implement the systems for regulation of energy consumption;
- Make a deep analysis of energy consumption within their companies;
- Make investments into energy efficiency that are connected with EP consumption with the maximum payback period of 3 years.

Participating companies that comply with these requirements are released from payment of the EP tax introduced in 2004. The participants that failed to fulfill their obligations must return the funds received as part of the additional benefit.

**Investment Support of the Transition from Direct Electric and Oil Heating to District Heating, Bio Energy, Heat Pumps and Solar Heating** is also important for ESCO. The Program has been implemented since 2006. Its budget is 2 billion Swedish crowns and the support is provided in the form of subsidies.

**National Program of Energy Efficiency and Smart Houses** is focused on energy efficiency in buildings and is a supplement to the existing measures in the area of energy efficiency. It offers solutions for the ambitious goal of reducing the total specific consumption of energy for the heated area of existing residential buildings and other premises by 20% until 2020 and by 50% until 2050 (as compared to 1995).

**Political tools and measures.** Existing tax policy is considered as an especially important tool of energy efficiency improvement and ensuring the quality of energy services. The tax rates are high and differ considerably. The taxes are mainly collected at the place of consumption. Positive results are proved by the reduction of consumption by households, though the sector's volume and the number of population grow.

**Procurement policy.** Sweden is a leader in development and procurement of new energy efficiency technologies. This approach is widely used in the areas of heating, hot water supply, ventilation, etc. Within 5 years, 377 million Swedish crowns were spent for the procurement of energy technologies.
As a tool of energy efficiency improvement in the public sector, public procurement is included into the Energy Policy Program. Special requirements and methods in the area of procurement of energy efficient equipment, as well as dissemination of information on the procurement, have been developed. The program evaluation proves that the energy efficiency criteria have not yet become a priority for public procurements (although the potential of energy efficiency improvement in the public sector is high) so the decision was made to continue the efforts in this area.

**Energy labeling of household electric appliances** is mandatory and was introduced on the basis of EU Directives. Labeling of lamps, electric ranges, fridges, freezers, dryers, washing and dish-washing machines is required. According to the evaluation made by the Swedish Agency for Protection of Consumers’ Rights, since its introduction, labeling contributed to the reduction of the average energy consumption by new household electric devices by 25 – 35%. Also, labeling resulted in disappearance of the electric devices with low energy efficiency from the market. Recently, changes have been introduced in the area of testing, labeling and certification in order to cover other types of energy consuming equipment in addition to the household electric appliances.

**Information and awareness raising** is an element of all programs. However, it is used within specialized campaigns as well. The main information source in the area of energy efficiency is STEM that uses many different channels and works with a large number of various companies to make sure that the information reaches targeted groups. Every year, STEM updates its statistic data on energy saving and disseminates them among municipalities primarily including the recommendations on implementation of different model solutions for saving of energy.

At the local level, an important role in informing the public and businesses (including small and medium companies) is played by energy consultant that started functioning back in 1998. The priority is given to the activities aimed at improvement of the efficiency of energy consumption. Services are rendered to the consumers free of charge. The consultant’s services are fully or partially paid for by STEM.

Implementation of these programs brings its results and the country steadily moves towards its targets in the area of energy efficiency and energy service development.

### 8.3.2.2. Factors that stimulate the use of Energy Performance Contracts

Use of EPCs is stimulated by the regulatory documents where the following key factors are used:

1. Market and legislative tools that cause increase of prices for electricity, will increase profitability of the energy efficiency improvement measures in the future and, thus, support development of the market;
2. Relevant technical research and successful pilot projects;
3. Coordinated efforts for preparation of the information needed for the customers of ESCO including recommendations on procurement, evaluation methodologies, model contracts, etc.;
4. Clear legal regulation of the regulatory environment in the area of energy services.

### 8.3.2.3. Current condition of the energy service market

In 2007, there were only 15 ESCOs in Sweden that offered energy services in the EPC format. In the recent years, the Swedish energy service market has demonstrated considerable growth.

Currently, there are about 50 national companies and a small number of international companies operating in the energy service market who offer energy service instruments in addition to their core business. There are also small national companies that view energy service as their main business activity.

In Sweden, there is the National Association of Energy Service Companies – Forum for Energy Services that unites many of the country’s ESCOs.

Most of energy service projects are implemented in the public sector. A significant support is provided for the public authorities that order energy services by the Swedish Energy Agency – STEM.

The estimated volume of ESCs in the country is EUR 80 million a year. The total energy saving potential in the country is estimated as 15% of the current demand for energy or EUR 650 million with relatively short payback periods.

The two most common forms of EPC are GSC (Guaranteed Savings Contract) and SSC (Shared Savings Contract).

Much attention is given to energy saving guarantees as an important EPC component. They make owners of the projects confident and reduce the interest rates for loans.
The main source of funding for ESCO projects is the client's own money and the monies from state funds, specifically for small projects. Third-party funding is not a common case, although the Nordic Commercial Bank of Sweden has experience of ESCO crediting.

A specific feature of the use of financial schemes in the country is that public institutions use the funds saved as a result of EPC implementation for purchase of equipment in order to use renewable energy sources, such as, wind farms.

8.3.2.4. Best cases of implementation of energy performance contracts

In Sweden, many highly efficient EPCs with significant economic and environmental effects have been implemented. Among those, the following EPC should be specifically noted:

1. Modernization of municipal buildings in Nyköping (public buildings, schools etc.);
2. Modernization of municipal buildings in Örebro (preschool institutions, schools, swimming pools, culture and sports facilities, offices, etc.);
3. Modernization of the buildings of the Swedish University of Agricultural Sciences.

As a result of implementation of these EPCs, annual energy saving was 17% to 73%, greenhouse gas emissions were reduced from 24% to 36%, and saving of the costs for maintenance of buildings ranged from 73 million Swedish crowns (EUR 7.9) to 156 million Swedish crowns (EUR 17 million) a year.

Implementation of these EPCs allowed to introduce new training programs in bioenergy and to develop a long-term strategy of sustainable use of the country's natural resources.

8.3.2.5. Barriers for energy service development

The following obstacles impede the development of the energy service market:

- Limited knowledge of energy service;
- Insufficient results of research;
- Lack of trust in EPC and ESCO due to previous failures.

According to the specialists' estimates, elimination of these barriers will double the size of the energy service market in the country.

8.3.3. Energy service market in the Netherlands

Introduction of the system of efficient management of the energy consumption in the Netherlands began in the 1990s without entries into EPCs. The state used to establish norms of energy consumption in different sectors of the economy and strictly controlled compliance. Only after 2007, a number of favorable legal acts and financial incentives was adopted in the country for the development of the energy service market.

8.3.3.1. Legal frameworks of energy service contracts

Strategic basis. As EU member state, the Netherlands follow in its state policy the obligations and requirements of the European strategy on energy efficiency improvement and use of renewable sources for energy generation, power supply and production of transport fuel.

The White Book. In December 2007, the government adopted a document called “White Book on Energy Efficiency Improvement and Use of Environmentally Clean Energy Sources” that defines the directions of the state policy in these areas. According to the White Book, the government intends to fulfill the four priority tasks:

- Reduction of greenhouse gas emissions by 30% in 1990 – 2020;
- Increase of the RES share in the total energy structure by 20% by 2020;
- Annual energy efficiency improvement by 2% by 2020;
- Significant progress aimed at the transition to the efficient energy system by 2020.

Energy Report. Another important document that defines the state policy in the area of energy efficiency and RES is the Energy Report. This document is published once every four years and determines the directions of the state policy in the energy area for the next period. In 2012, the government issued its regular Energy Report that describes the state strategy in the energy area for the period until 2016 and in the long run until 2050.
The Report is aimed at creation of the environmentally friendly, economically affordable and reliable energy efficient system and defines the country’s role in the development of energy resources, environmentally clean technologies and energy services in compliance with the principles of sustainable development. The Report emphasizes the importance of fundamental changes in the energy supply structure in order to find solutions for such global problems as growing demand for energy and increase of CO₂ emissions that cause growth of energy prices. In this connection, the government set goals for stimulation of environmentally clean energy supply, as well as diversification of energy generation sources.

Organizational basis. The responsibility for implementation of the energy efficiency policy in the country is divided among the following ministries:

1. Ministry of Economy – the key institution in charge of implementation of the general energy efficiency policy, as well as energy efficiency improvement measures and energy service development in the industry and energy sectors;
2. Ministry of Housing Construction, Territorial Planning and Environment is responsible for implementation of the energy efficiency and energy service principles in construction and operation of buildings;
3. Ministry of Transport is responsible for energy efficiency improvement in the transportation sector;

The key players in the area of energy saving are the State Energy Agency and the Center of Energy Research (ECN).

The State Energy Agency implements the energy efficiency policy in cooperation with the Government, the industry sector, consumers and research institutions with the aim of stimulation of sustainable development in the areas of energy and environmental protection, as well as creation of conditions for energy efficient use of energy resources. The Agency provides organizational, technical and consulting assistance on the issues of energy efficiency, improvement of the environment and economic performance of the business.

The Dutch Center of Energy Research develops forecasts as to the reduction of CO₂ emissions and energy efficiency.

Key measures of the state policy. The key measures for energy efficiency improvement, RES development and energy services are:

- Tax instruments, including tax deductions for investments into the energy sector;
- Instruments that stimulate development of innovations in the energy sector: technological platforms for development of energy efficiency, provision of subsidies and fundamental research;
- Voluntary agreements with the industry, energy service, transport and agricultural sectors, as well as individual energy companies.

For the purposes of energy efficiency improvement, development of RES and energy services, the government plans to allocate annually EUR 274 million to EUR 314 million.

The state budget expenditures for energy efficiency improvement and energy service grew by 40% in comparison with previous years.

8.3.3.2. Factors that stimulate the use of EPC

The use of EPC is stimulated by regulatory documents using the following key factors:

1. Legislative measures for introduction of the energy efficiency standards in new buildings, subsidies for private buildings for their renovation, as well as various mechanisms for tax benefits;
2. Progressive system of taxation of energy consumption (the taxes are proportionate to the consumption of energy resources). This makes energy saving measures more attractive for households and small companies;
3. Privatization of the gas and electricity markets created more opportunities for energy service development;
4. Targeted environmental information for the society and political support;
5. Political goal of the government to ensure energy efficiency in buildings and support of their reconstruction and modernization.
8.3.3.3. Current condition of the energy service market

Most EPCs in the Netherlands are implemented in medium and large non-residential buildings and connected with improvement of their energy systems. There are also EPCs for street lighting projects.

Today, there are over 50 ESCOs in the country, including energy supplying, construction and engineering companies. The relatively small number of ESCOs is due to the fact that the goal of rational use of energy became relevant even before appearance of EPC.232

In the Netherlands, the following two forms of EPC are common: GSC (Guaranteed Savings Contract) and SSC (Shared Savings Contract).

The total value of possible projects in the area of energy efficiency with the payback period to 10 years is as follows:
- in the industry – to EUR 9 million;
- in the services – to EUR 21 million;
- in the transport – to EUR 9 million;
- in the households – to EUR 12 million.

Energy efficiency is one of the top priorities for the country. The tools used in this area, however, are often different from EPC. For energy efficiency improvement in the industry and construction. Voluntary agreements have been successfully used. EPCs are mainly based on grants and preferential loans in the residential sector.

The Dutch National Energy Agency (SenterNovem) actively supports the EPC mechanisms and developed standard contracts for ESCO, as well as the guidelines for management of buildings taking into account the EPC opportunities.

8.3.3.4. Best cases of EPC implementation

Although the number of EPCs in the country is not large, some of them are very interesting and worth sharing. These are EPCs for modernization of buildings in Rotterdam. The city is working to achieve the target of CO\textsubscript{2} reduction by 50% by 2025 compared with the 1990 levels. Similarly to London, Rotterdam is a member of C40 Cities Climate Leadership Group.233 The city has implemented a project for bringing all buildings in the public sector to the low energy consumption level mainly due to ESCO activities. As a result of implementation of the project, consumption of energy in the city’s buildings was reduced almost by a third. As part of modernization of the city’s buildings, Rotterdam developed the city development project and the contract model for pilot projects that may be used by other projects on energy efficiency improvement in public buildings.

Another important EPC is implementation of the REIM Building Fund that results in the creation of a climatically neutral (without CO\textsubscript{2} emissions) office building in the Hague.

8.3.3.5. Barriers for energy service development

The following obstacles impede the development of the energy service market in the Netherlands:
- Availability of alternatives for energy efficiency improvement;
- Insufficient information for potential customers as to the EPC advantages;
- Skepticism with regard to the complexity of monitoring of energy efficiency and price verification of energy efficiency;
- Perception of EPC by private sector as highly risky;
- There is only one agency in charge of management and maintenance of all buildings in public ownership, which restricts opportunities to involve ESCO;
- Social housing sector is a large potential market for energy services; however, it has been already sufficiently financed by governmental programs;
- Energy service market is relatively small, although there are no exact estimates of its potential.

No doubt, ESCO could increase the abovementioned potential of energy saving. However, the degree of direct involvement of ESCO by potential Dutch customers is relatively low and the lack of relevant institutional framework makes the development of energy service business more difficult.

233 Gemeente Rotterdam. – Available at: http://www.rotterdam.nl/question____answers_rotterdamse_groene_gebouwen.
IX. FINDINGS AND RECOMMENDATIONS
High energy intensity of Ukrainian economy, caused by inefficient use of energy resources, is a threat to the country’s energy security and has a negative impact on the environment and people’s welfare. The critical situation in the area of consumption of energy resources requires improvement of the economy’s energy efficiency. The large energy saving potential that reached almost 50% by the experts’ estimates is one of the key factors of the sector’s investment attractiveness. Investments into energy efficiency may reduce energy intensity of GDP and satisfy the growing demand for energy resources with the costs three times lower than the capital investments needed for the construction of the new generating facilities.

No doubt, activities in the area of energy saving must cover consumers of energy resources in all sectors of the national economy. However, the building sector (residential and public buildings) with its share of almost 34% in the end consumption of energy resources requires state support the most. This is due to the high social sensitivity of household consumers to the growth of energy prices and the need for the state to create relevant framework conditions for stimulation of implementation of energy efficiency measures in this sector.

With the support of international donors, a number of projects have been implemented in Ukraine for energy efficiency improvement of buildings. However, their positive experience has not been disseminated due to lack of legislative regulation of funding mechanisms for energy efficiency projects, as well as lack of proper motivation of the consumers for energy saving. In 2015, the conditions for the increased demand for energy efficiency measures began developing in Ukraine. This was connected with the increase of the tariffs for energy resources and adoption of a number of laws that create conditions to attract investments into energy efficiency projects in the public sector and are aimed at regulating the ownership relations in multi-family buildings. Another positive factor was the government’s decisions on financial support of citizens who implement energy efficiency measures in their buildings.

International practice demonstrates positive experiences of implementation of energy efficiency projects using different tools and mechanisms in order to satisfy the consumers’ needs in professional services for reduction of energy consumption.

With this view, it is very important for Ukraine to implement the best international practices of Energy Performance Contracting that allow ensuring a comprehensive approach to the solutions for energy efficiency improvement on mutually beneficial terms for both the customers and providers of energy services.

This study allows to make an important conclusion that the existing potential for reduction of energy consumption and energy efficiency improvement allows using the EPC mechanism in Ukraine even today. The advantages of this mechanism have been already appreciated by some industrial enterprises, as well as individual communities and household consumers in the previous years.

At the moment, Ukraine has only made first steps towards legislative regulation of the ways in which EPC may be applied in the public sector. Measures are being taken to improve the tariff policy and the mechanisms are being tested for the funding of energy efficiency projects including state and local support. At the same time, considering the critical situation in the area of energy consumption, primarily, in the building sector, it appears advisable to concentrate the efforts of public authorities, business and expert communities on further development of the energy service market, particularly, through:

- Creation of necessary legislative framework conditions:
  - Establishment of uniform approaches to the feasibility studies of energy efficiency projects;
  - Implementation of the principles for setting the baseline consumption of energy resources in compliance with ISO/CD 50006 “Energy baseline and energy performance indicators (EnPIs) – General principles and guidance”;
  - Implementation of the International Performance Measurement and Verification Protocol – IPMVP for regulation of the verification of the results of energy efficiency projects;
  - Development and implementation of the system for ESCO certification according to international standards;
  - Development of the mechanisms for stimulation of consumers to implement energy efficiency measures;
  - Improvement of the public procurement procedures taking into account the specifics of energy services.
- Improvement of the conditions for the access of the customers of energy service/small and medium ESCOs to financial resources:
  - Creation of a favorable investment climate on the basis of the transparent and clear framework conditions for investors, as well as ensuring economic attractiveness of energy efficiency projects and legal protection of investments;
Introduction of innovative long-term financing (forfeiting, invoice-based funding and loan repayment, etc.);
Establishment of the State Energy Efficiency Fund as a guaranteed source of funding for energy efficiency projects with participation of international financial organizations;
Further activities for reduction of the cost of loans.

Introduction of stimulating mechanisms:
Launch of the state support programs for EPC through:
- Financial support/subsidies for EPC;
- Subsidies for energy audits;
- Provision of ESCO vouchers\(^{234}\) for small and medium businesses, introduction of non-taxable municipal leasing, etc.

Further improvement of the tariff policy:
- Transparency and clarity of the tariff generation procedure, as well as reliability of input data on the components of the tariffs used for calculation;
- Generation of the tariffs on economically justified basis including the investment component;
- Improvement of the subsidy policy using mechanisms for stimulation of the recipients for energy saving through redistribution of relevant funds for direct implementation of energy efficiency measures.

Raising awareness of the consumers of energy resources (potential energy service customers) of the advantages and specifics of EPC:
- Dissemination of information on key principles of EPC application, experiences of successfully implemented energy efficiency improvement projects, modern technologies, economic and environmental benefits; creation of the national database with the free and direct access for interested parties to the data on the energy service projects and the experience of their implementation, as well as potential contractors, etc.;
- Launch of training programs in energy service for representatives of public authorities and other consumers of energy resources.

Implementation of the state support and coordination among the market participants through:
- Creation of new and support of existing market facilitators (agencies, professional associations, consultants, etc.) to support the generation of demand and supply for energy service;
- Development of practical recommendations and step-by-step methodologies for potential energy service customers with regard to organization and implementation of energy efficiency projects using the EPC mechanisms;
- Creation of the system of improvement of qualifications of the specialists in development and implementation of EPC (training sessions, educational programs, methodological recommendations, etc.);
- Launch of the training program on financial mechanisms used for energy service for the cooperation among the local financial institutions (for instance, banks, revolving funds, etc.).

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\(^{234}\) ESCO voucher means providing small grants, aimed to support the implementation of projects under the scheme of energy service contracts. For example, the program in the Netherlands in the province Limburg “Bespaar en verdien!” (Save the energy and earn!) provides the support to small and medium sized enterprises which implement their energy efficiency measures. This voucher is used to finance energy audits, performed by ESCOs or another certified company and for additional financing up to 33% of the proposed measures’ costs.
Table 1. Cost of natural gas for industry, publicly funded institutions and other commercial consumers except religious organizations as of 06.01.2015

<table>
<thead>
<tr>
<th>Name of company</th>
<th>Cost w/o VAT</th>
<th>Tariff for transportation via main pipelines</th>
<th>Tariff for gas transportation approved by NEURC</th>
<th>Tariff for gas supply approved by NEURC</th>
<th>Targeted markup of 2%</th>
<th>VAT</th>
<th>Cost for the consumer including VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VinnytsiaGas</td>
<td>6600</td>
<td>113,2</td>
<td>543</td>
<td>97,3</td>
<td>144</td>
<td>1499,5</td>
<td>8997</td>
</tr>
<tr>
<td>VolynGas</td>
<td>6600</td>
<td>53,7</td>
<td>602,5</td>
<td>85,4</td>
<td>144</td>
<td>1497,12</td>
<td>8982,72</td>
</tr>
<tr>
<td>DniproGas</td>
<td>6600</td>
<td>396,2</td>
<td>260</td>
<td>61,4</td>
<td>144</td>
<td>1492,32</td>
<td>8953,92</td>
</tr>
<tr>
<td>DnipropetrovskGas</td>
<td>6600</td>
<td>218,8</td>
<td>437,4</td>
<td>134,9</td>
<td>144</td>
<td>1507,02</td>
<td>9042,12</td>
</tr>
<tr>
<td>DonetskOblGas</td>
<td>6600</td>
<td>401,5</td>
<td>254,7</td>
<td>54,6</td>
<td>144</td>
<td>1490,96</td>
<td>8945,76</td>
</tr>
<tr>
<td>ZhytomyrGas</td>
<td>6600</td>
<td>208,8</td>
<td>447,4</td>
<td>97,3</td>
<td>144</td>
<td>1499,5</td>
<td>8997</td>
</tr>
<tr>
<td>ZakarpatGas</td>
<td>6600</td>
<td>18,6</td>
<td>637,6</td>
<td>102,4</td>
<td>144</td>
<td>1500,52</td>
<td>9003,12</td>
</tr>
<tr>
<td>ZaporizhGas</td>
<td>6600</td>
<td>340,7</td>
<td>315,5</td>
<td>81,4</td>
<td>144</td>
<td>1496,32</td>
<td>8977,92</td>
</tr>
<tr>
<td>Ivano-FrankivskGas</td>
<td>6600</td>
<td>17,6</td>
<td>638,6</td>
<td>109,2</td>
<td>144</td>
<td>1501,88</td>
<td>9011,28</td>
</tr>
<tr>
<td>KirovohradGas</td>
<td>6600</td>
<td>214,9</td>
<td>441,3</td>
<td>86,7</td>
<td>144</td>
<td>1497,38</td>
<td>8984,28</td>
</tr>
<tr>
<td>KyivGas</td>
<td>6600</td>
<td>538</td>
<td>118,2</td>
<td>58,1</td>
<td>144</td>
<td>1491,66</td>
<td>8949,96</td>
</tr>
<tr>
<td>KiyivOblGas</td>
<td>6600</td>
<td>279,3</td>
<td>376,9</td>
<td>85,9</td>
<td>144</td>
<td>1497,22</td>
<td>8983,32</td>
</tr>
<tr>
<td>KryvorizhGas</td>
<td>6600</td>
<td>461</td>
<td>195,2</td>
<td>112,1</td>
<td>144</td>
<td>1502,46</td>
<td>9014,76</td>
</tr>
<tr>
<td>LvivGas</td>
<td>6600</td>
<td>33,8</td>
<td>622,4</td>
<td>137</td>
<td>144</td>
<td>1507,44</td>
<td>9044,64</td>
</tr>
<tr>
<td>LuhanskGas</td>
<td>6600</td>
<td>311,4</td>
<td>344,8</td>
<td>40,9</td>
<td>144</td>
<td>1488,22</td>
<td>8929,32</td>
</tr>
<tr>
<td>MykolaivGas</td>
<td>6600</td>
<td>140,5</td>
<td>515,7</td>
<td>104,9</td>
<td>144</td>
<td>1501,02</td>
<td>9006,12</td>
</tr>
<tr>
<td>OdesaGas</td>
<td>6600</td>
<td>430,7</td>
<td>225,5</td>
<td>80</td>
<td>144</td>
<td>1496,04</td>
<td>8976,24</td>
</tr>
<tr>
<td>PoltavaGas</td>
<td>6600</td>
<td>115,2</td>
<td>541</td>
<td>80,3</td>
<td>144</td>
<td>1496,1</td>
<td>8976,6</td>
</tr>
<tr>
<td>RivneGas</td>
<td>6600</td>
<td>144,1</td>
<td>512,1</td>
<td>90,7</td>
<td>144</td>
<td>1498,18</td>
<td>8989,08</td>
</tr>
<tr>
<td>SumyGas</td>
<td>6600</td>
<td>266,1</td>
<td>390,1</td>
<td>89,6</td>
<td>144</td>
<td>1497,96</td>
<td>8987,76</td>
</tr>
<tr>
<td>KharkivGas</td>
<td>6600</td>
<td>109,7</td>
<td>546,5</td>
<td>89,8</td>
<td>144</td>
<td>1498</td>
<td>8988</td>
</tr>
<tr>
<td>KharkivMiskGas</td>
<td>6600</td>
<td>467,7</td>
<td>188,5</td>
<td>97,9</td>
<td>144</td>
<td>1499,62</td>
<td>8997,72</td>
</tr>
<tr>
<td>KhersonGas</td>
<td>6600</td>
<td>217,3</td>
<td>438,9</td>
<td>103,8</td>
<td>144</td>
<td>1500,8</td>
<td>9004,8</td>
</tr>
<tr>
<td>KhmelnytskGas</td>
<td>6600</td>
<td>164,1</td>
<td>492,1</td>
<td>93,1</td>
<td>144</td>
<td>1498,66</td>
<td>8991,96</td>
</tr>
<tr>
<td>ChernkasyGas</td>
<td>6600</td>
<td>455,1</td>
<td>201,1</td>
<td>124</td>
<td>144</td>
<td>1504,84</td>
<td>9029,04</td>
</tr>
<tr>
<td>ChernivtsiGas</td>
<td>6600</td>
<td>8,3</td>
<td>647,9</td>
<td>104,4</td>
<td>144</td>
<td>1500,92</td>
<td>9005,52</td>
</tr>
<tr>
<td>ChernihivGas</td>
<td>6600</td>
<td>37,9</td>
<td>618,3</td>
<td>94,4</td>
<td>144</td>
<td>1498,92</td>
<td>8993,52</td>
</tr>
<tr>
<td>Average price</td>
<td>6600</td>
<td>294,4</td>
<td>361,8</td>
<td>90,3</td>
<td>144</td>
<td>1498,1</td>
<td>8988,6</td>
</tr>
</tbody>
</table>

Table 2. Retail prices for natural gas used in households as of 05.01.2015 (approved by NEURC Resolution dated 03.03.2015 No. 583)

<table>
<thead>
<tr>
<th>Price differentiation</th>
<th>Price for 1 m³ incl. VAT, UAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>For cooking and/or heating of water</td>
<td>7,188</td>
</tr>
<tr>
<td>For individual heating (individual heating, cooking and/or heating of water):</td>
<td></td>
</tr>
<tr>
<td>• between 1 May and 30 September (inclusive):</td>
<td>7,188</td>
</tr>
<tr>
<td>• between 1 October and 30 April (inclusive):</td>
<td></td>
</tr>
<tr>
<td>• for the consumed volume to 200 m³ of natural gas a month (inclusive):</td>
<td>3,600</td>
</tr>
<tr>
<td>• for the consumed volume above 200 m³ of natural gas a month:</td>
<td>7,188</td>
</tr>
</tbody>
</table>
### Table 3. Tariff for electricity supplied to households between 1 April 2015 and 31 August 2015 inclusive (approved by NEURC Resolution dated 02.26.2015 No. 220)

<table>
<thead>
<tr>
<th>Consumer category</th>
<th>Tariffs for electricity, in kopykas, per 1 kW·hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Value-Added Tax</td>
</tr>
<tr>
<td>1. Electricity supplied to:</td>
<td></td>
</tr>
<tr>
<td>1.1. Households (including the residents of residential buildings equipped by electric ranges):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 100 kW·hour of electricity per month (inclusive)</td>
<td>30,5</td>
</tr>
<tr>
<td>for the consumption over 100 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>52,5</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>117,25</td>
</tr>
<tr>
<td>1.2. Households in rural areas (including the residents of residential buildings equipped by electric cookers):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 150 kW·hour of electricity per month (inclusive)</td>
<td>30,5</td>
</tr>
<tr>
<td>for the consumption over 150 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>52,5</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>117,25</td>
</tr>
<tr>
<td>1.3. Households in residential buildings (including “apartment hotel” buildings, apartments and dormitories) equipped by electric heating installations in accordance with the established procedure (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.3.1. During the period of 1 April 2015 to 30 April 2015 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>30,5</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>117,25</td>
</tr>
<tr>
<td>1.3.2. During the period of 1 May 2015 to 31 August 2015 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>1.4. Households in multi-family buildings without natural gas supply and without district heating systems or if those systems do not function (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.4.1. During the period of 1 April 2015 to 30 April 2015 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>30,5</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>117,25</td>
</tr>
<tr>
<td>1.4.2. During the period of 1 May 2015 to 31 August 2015 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>1.5. For families with many children, foster families and family-type children's homes irrespective of the energy consumption volume</td>
<td>30,5</td>
</tr>
<tr>
<td>1.6. Households that pay to energy supplying organizations based on the common estimated metering and organized into legal entities, housing maintenance organizations except dormitories</td>
<td>52,5</td>
</tr>
<tr>
<td>1.7. Dormitories (falling under the definition of the “households that pay to energy supplying organizations based on the common estimated metering”)</td>
<td>30,5</td>
</tr>
</tbody>
</table>
### Table 4. Tariffs for electricity supplied to households for the period of 1 September 2015 to 29 February 2016 inclusive

<table>
<thead>
<tr>
<th>Consumer category</th>
<th>Tariffs for electricity, in kopiykas, per 1 kW·hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Value-Added Tax</td>
</tr>
<tr>
<td>1. Electricity supplied to:</td>
<td></td>
</tr>
<tr>
<td>1.1. Households (including the residents of residential buildings equipped by electric ranges):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 100 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 100 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>65,75</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>123,25</td>
</tr>
<tr>
<td>1.2. Households in rural areas (including the residents of residential buildings equipped by electric cookers):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 150 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 150 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>65,75</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>123,25</td>
</tr>
<tr>
<td>1.3. Households in residential buildings (including “apartment hotel” buildings, apartments and dormitories) equipped by electric heating installations in accordance with the established procedure (including rural areas)):</td>
<td></td>
</tr>
<tr>
<td>1.3.1. During the period of 01 September 2015 to 30 September 2015 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>1.3.2. During the period of 01 October 2015 to 29 February 2016 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123,25</td>
</tr>
<tr>
<td>1.4. Households in multi-family buildings without natural gas supply and without district heating systems or if those systems do not function (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.4.1. During the period of 1 September 2015 to 30 September 2015 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>1.4.2. During the period of 1 October 2015 to 29 February 2016 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123,25</td>
</tr>
<tr>
<td>1.5. For families with many children, foster families and family-type children's homes irrespective of the energy consumption volume</td>
<td></td>
</tr>
<tr>
<td>1.6. Households that pay to energy supplying organizations based on the common estimated metering and organized into legal entities; housing maintenance organizations except dormitories</td>
<td></td>
</tr>
<tr>
<td>1.7. Dormitories (falling under the definition of the “households that pay to energy supplying organizations based on the common estimated metering”)</td>
<td></td>
</tr>
</tbody>
</table>

**APPENDICES**
Table 5. Tariffs for electricity supplied to households for the period of 1 March to 31 August 2016 inclusive

<table>
<thead>
<tr>
<th>Consumer category</th>
<th>Tariffs for electricity, in kopiykas, per 1 kW·hour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Value-Added Tax</td>
<td>Value-Added Tax</td>
</tr>
<tr>
<td>1. Electricity supplied to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1. Households (including the residents of residential buildings equipped by electric ranges):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 100 kW·hour of electricity per month (inclusive)</td>
<td>47,5</td>
<td>9,5</td>
</tr>
<tr>
<td>for the consumption over 100 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>82,5</td>
<td>16,5</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>130</td>
<td>26</td>
</tr>
<tr>
<td>1.2. Households in rural areas (including the residents of residential buildings equipped by electric cookers):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 150 kW·hour of electricity per month (inclusive)</td>
<td>47,5</td>
<td>9,5</td>
</tr>
<tr>
<td>for the consumption over 150 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>82,5</td>
<td>16,5</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>130</td>
<td>26</td>
</tr>
<tr>
<td>1.3. Households in residential buildings (including “apartment hotel” buildings, apartments and dormitories) equipped by electric heating installations in accordance with the established procedure (including rural areas)):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3.1. During the period of 1 March 2016 to 30 April 2016 (inclusive):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>47,5</td>
<td>9,5</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>130</td>
<td>26</td>
</tr>
<tr>
<td>1.3.2. During the period of 1 May 2016 to 31 August 2016 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4. Households in multi-family buildings without natural gas supply and without district heating systems or if those systems do not function (including rural areas):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4.1. During the period of 1 March 2016 to 30 April 2016 (inclusive):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>47,5</td>
<td>9,5</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>130</td>
<td>26</td>
</tr>
<tr>
<td>1.4.2. During the period of 01 May 2016 to 31 August 2016 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5. For families with many children, foster families and family-type children’s homes irrespective of the energy consumption volume</td>
<td>47,5</td>
<td>9,5</td>
</tr>
<tr>
<td>1.6. Households that pay to energy supplying organizations based on the common estimated metering and organized into legal entities; housing maintenance organizations except dormitories</td>
<td>82,5</td>
<td>16,5</td>
</tr>
<tr>
<td>1.7. Dormitories (falling under the definition of the “households that pay to energy supplying organizations based on the common estimated metering”)</td>
<td>47,5</td>
<td>9,5</td>
</tr>
</tbody>
</table>
Table 6. Tariffs for electricity supplied to households for the period of 1 September 2016 to 28 February 2017 inclusive

<table>
<thead>
<tr>
<th>Consumer category</th>
<th>Tariffs for electricity, in kopiykas, per 1 kW·hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Value-Added Tax</td>
</tr>
<tr>
<td>1. Electricity supplied to:</td>
<td></td>
</tr>
<tr>
<td>1.1. Households (including the residents of residential buildings equipped by electric ranges):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 100 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 100 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>65.75</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.2. Households in rural areas (including the residents of residential buildings equipped by electric cookers):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 150 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 150 kW·hour and to 600 kW·hour of electricity per month (inclusive)</td>
<td>65.75</td>
</tr>
<tr>
<td>for the consumption over 600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.3. Households in residential buildings (including “apartment hotel” buildings, apartments and dormitories) equipped by electric heating installations in accordance with the established procedure (including rural areas)):</td>
<td></td>
</tr>
<tr>
<td>1.3.1. During the period of 1 September 2016 to 30 September 2016 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.3.2. During the period of 1 October 2016 to 28 February 2017 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.4. Households in multi-family buildings without natural gas supply and without district heating systems or if those systems do not function (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.4.1. During the period of 1 September 2016 to 30 September 2016 (inclusive) in accordance with sub-clauses 1.1 and 1.2</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.4.2. During the period of 1 October 2016 to 28 February 2017 (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.5. For families with many children, foster families and family-type children’s homes irrespective of the energy consumption volume</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
<tr>
<td>1.6. Households that pay to energy supplying organizations based on the common estimated metering and organized into legal entities, housing maintenance organizations except dormitories</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>65.75</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td></td>
</tr>
<tr>
<td>1.7. Dormitories (falling under the definition of the “households that pay to energy supplying organizations based on the common estimated metering”)</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3600 kW·hour of electricity per month (inclusive)</td>
<td>38</td>
</tr>
<tr>
<td>for the consumption over 3600 kW·hour of electricity per month</td>
<td>123.25</td>
</tr>
</tbody>
</table>
Table 7. Tariffs for electricity supplied to households since 1 March 2017

<table>
<thead>
<tr>
<th>Consumer category</th>
<th>Tariffs for electricity, in kopiyskas, per 1 kW·hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without Value-Added Tax</td>
</tr>
<tr>
<td>1. Electricity supplied to:</td>
<td></td>
</tr>
<tr>
<td>1.1. Households (including the residents of residential buildings equipped by electric ranges) (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 100 kW·hour of electricity per month (inclusive)</td>
<td>75</td>
</tr>
<tr>
<td>for the consumption over 100 kW·hour of electricity per month</td>
<td>140</td>
</tr>
<tr>
<td>1.2. Households in residential buildings (including “apartment hotel” buildings, apartments and dormitories) equipped by electric heating installations in accordance with the established procedure (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.2.1. During the period of 1 May to 30 September (inclusive) in accordance with sub-clause 1.1</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3000 kW·hour of electricity per month (inclusive)</td>
<td>75</td>
</tr>
<tr>
<td>for the consumption over 3000 kW·hour of electricity per month</td>
<td>140</td>
</tr>
<tr>
<td>1.2.2. During the period of 1 October to 30 April (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3000 kW·hour of electricity per month (inclusive)</td>
<td>75</td>
</tr>
<tr>
<td>for the consumption over 3000 kW·hour of electricity per month</td>
<td>140</td>
</tr>
<tr>
<td>1.3. Households in multi-family buildings without natural gas supply and without district heating systems or if those systems do not function (including rural areas):</td>
<td></td>
</tr>
<tr>
<td>1.3.1. During the period of 1 May to 30 September (inclusive) in accordance with sub-clause 1.1</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3000 kW·hour of electricity per month (inclusive)</td>
<td>75</td>
</tr>
<tr>
<td>for the consumption over 3000 kW·hour of electricity per month</td>
<td>140</td>
</tr>
<tr>
<td>1.3.2. During the period of 1 October to 30 April (inclusive):</td>
<td></td>
</tr>
<tr>
<td>for the consumption up to 3000 kW·hour of electricity per month (inclusive)</td>
<td>75</td>
</tr>
<tr>
<td>for the consumption over 3000 kW·hour of electricity per month</td>
<td>140</td>
</tr>
<tr>
<td>1.4. For families with many children, foster families and family-type children’s homes irrespective of the energy consumption volume</td>
<td>75</td>
</tr>
<tr>
<td>1.5. Households that pay to energy supplying organizations based on the common estimated metering and organized into legal entities, housing maintenance organizations except dormitories</td>
<td>140</td>
</tr>
<tr>
<td>1.6. Dormitories (falling under the definition of the “households that pay to energy supplying organizations based on the common estimated metering”)</td>
<td>75</td>
</tr>
<tr>
<td>No.</td>
<td>Oblast Center</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>Vinnytsia</td>
</tr>
<tr>
<td>2</td>
<td>Lutsk</td>
</tr>
<tr>
<td>3</td>
<td>Dnipropetrovsk</td>
</tr>
<tr>
<td>4</td>
<td>Mariupol</td>
</tr>
<tr>
<td>5</td>
<td>Zhytomyr</td>
</tr>
<tr>
<td>6</td>
<td>Uzhgorod</td>
</tr>
<tr>
<td>7</td>
<td>Zaporizhia</td>
</tr>
<tr>
<td>8</td>
<td>Bila Tserkva</td>
</tr>
<tr>
<td>9</td>
<td>Kirovohrad</td>
</tr>
<tr>
<td>10</td>
<td>Severodonetsk</td>
</tr>
<tr>
<td>11</td>
<td>Liv</td>
</tr>
<tr>
<td>12</td>
<td>Mykolayiv</td>
</tr>
<tr>
<td>13</td>
<td>Poltava</td>
</tr>
<tr>
<td>14</td>
<td>Rivne</td>
</tr>
<tr>
<td>15</td>
<td>Sumy</td>
</tr>
<tr>
<td>16</td>
<td>Tempnoiul</td>
</tr>
<tr>
<td>17</td>
<td>Kharkiv</td>
</tr>
<tr>
<td>18</td>
<td>Kherson</td>
</tr>
<tr>
<td>19</td>
<td>Khmelnytskyi</td>
</tr>
<tr>
<td>20</td>
<td>Cherkesy</td>
</tr>
<tr>
<td>21</td>
<td>Chernivtsi</td>
</tr>
<tr>
<td>22</td>
<td>Chernihiv</td>
</tr>
</tbody>
</table>

* П – constant component of the double rate tariff for heating
** З – changeable component of the double rate tariff for heating
*** tariff for hot water in the buildings, which have towel dryers
**** tariff for hot water in the buildings, which do not have towel dryers
### Table 9. Information on the tariffs for water supply services by main companies for households and non-household consumers as of 1 June 2015

<table>
<thead>
<tr>
<th>No.</th>
<th>Oblast Center</th>
<th>Actual production cost (w/o VAT), UAH/cubic m</th>
<th>Approved tariffs with VAT, UAH</th>
<th>Degree of compensation of actual production cost with the approved tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>households</td>
<td>commercial consumers</td>
<td>1 cubic m of water</td>
</tr>
<tr>
<td>1</td>
<td>Vinnytsia</td>
<td>3.82</td>
<td>3.82</td>
<td>3.89</td>
</tr>
<tr>
<td>2</td>
<td>Lutsk</td>
<td>3.63</td>
<td>3.63</td>
<td>4.308</td>
</tr>
<tr>
<td>3</td>
<td>Dnipropetrovsk</td>
<td>4.15</td>
<td>4.15</td>
<td>4.68</td>
</tr>
<tr>
<td>4</td>
<td>Mariupol</td>
<td>4.42</td>
<td>4.42</td>
<td>2.21</td>
</tr>
<tr>
<td>5</td>
<td>Zhytomyr</td>
<td>4.83</td>
<td>4.83</td>
<td>4.00</td>
</tr>
<tr>
<td>6</td>
<td>Uzhgorod</td>
<td>7.46</td>
<td>7.46</td>
<td>8.17</td>
</tr>
<tr>
<td>7</td>
<td>Zaporizhia</td>
<td>5.16</td>
<td>5.16</td>
<td>4.75</td>
</tr>
<tr>
<td>8</td>
<td>Ivano-Frankivk</td>
<td>3.79</td>
<td>3.79</td>
<td>3.94</td>
</tr>
<tr>
<td>9</td>
<td>Bila Tserkva</td>
<td>4.07</td>
<td>4.07</td>
<td>4.34</td>
</tr>
<tr>
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<td>6.42</td>
<td>6.42</td>
<td>6.74</td>
</tr>
<tr>
<td>11</td>
<td>Severodonetsk</td>
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<td>4.01</td>
<td>2.35</td>
</tr>
<tr>
<td>12</td>
<td>Lviv</td>
<td>5.41</td>
<td>5.41</td>
<td>5.05</td>
</tr>
<tr>
<td>13</td>
<td>Mykolaiv</td>
<td>5.46</td>
<td>5.46</td>
<td>5.50</td>
</tr>
<tr>
<td>14</td>
<td>Odesa</td>
<td>5.65</td>
<td>5.65</td>
<td>4.93</td>
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<td>Poltava</td>
<td>5.74</td>
<td>5.74</td>
<td>5.84</td>
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<tr>
<td>16</td>
<td>Rivne</td>
<td>5.40</td>
<td>5.40</td>
<td>6.22</td>
</tr>
<tr>
<td>17</td>
<td>Sumy</td>
<td>4.071</td>
<td>4.071</td>
<td>3.95</td>
</tr>
<tr>
<td>18</td>
<td>Ternopil</td>
<td>2.90</td>
<td>2.90</td>
<td>3.432</td>
</tr>
<tr>
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<td>Kharkiv</td>
<td>4.540</td>
<td>4.540</td>
<td>5.68</td>
</tr>
<tr>
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<td>Kherson</td>
<td>4.42</td>
<td>4.42</td>
<td>5.30</td>
</tr>
<tr>
<td>21</td>
<td>Khmelnytskyi</td>
<td>4.03</td>
<td>4.03</td>
<td>4.245</td>
</tr>
<tr>
<td>22</td>
<td>Cherkasy</td>
<td>3.43</td>
<td>3.43</td>
<td>4.284</td>
</tr>
<tr>
<td>23</td>
<td>Chemivtsi</td>
<td>5.86</td>
<td>5.86</td>
<td>5.592</td>
</tr>
<tr>
<td>24</td>
<td>Chernihiv</td>
<td>4.478</td>
<td>4.478</td>
<td>5.80</td>
</tr>
<tr>
<td>25</td>
<td>Kyiv</td>
<td>2.91</td>
<td>2.91</td>
<td>3.89</td>
</tr>
<tr>
<td>No.</td>
<td>Oblast Center</td>
<td>Actual production cost (w/o VAT), UAH/cubic m</td>
<td>Approved tariffs with VAT, UAH</td>
<td>Degree of compensation of actual production cost with the approved tariffs</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>---------------------------------------------</td>
<td>-------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
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<td>3.63</td>
<td>4.212</td>
<td>6.59</td>
</tr>
<tr>
<td>2</td>
<td>Lutsk</td>
<td>3.26</td>
<td>3.684</td>
<td>4.21</td>
</tr>
<tr>
<td>3</td>
<td>Drohobychi</td>
<td>3.26</td>
<td>3.684</td>
<td>4.38</td>
</tr>
<tr>
<td>4</td>
<td>Mariupol</td>
<td>2.62</td>
<td>3.184</td>
<td>4.38</td>
</tr>
<tr>
<td>5</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
<tr>
<td>6</td>
<td>Uzhgorod</td>
<td>3.49</td>
<td>4.034</td>
<td>4.43</td>
</tr>
<tr>
<td>7</td>
<td>Zaporizhia</td>
<td>3.199</td>
<td>3.794</td>
<td>4.19</td>
</tr>
<tr>
<td>8</td>
<td>Ivano-Franko</td>
<td>3.49</td>
<td>4.094</td>
<td>4.43</td>
</tr>
<tr>
<td>9</td>
<td>Dnipropetrovsk</td>
<td>3.26</td>
<td>3.864</td>
<td>4.38</td>
</tr>
<tr>
<td>10</td>
<td>Mariupol</td>
<td>2.62</td>
<td>3.184</td>
<td>4.38</td>
</tr>
<tr>
<td>11</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
<tr>
<td>12</td>
<td>Zaporizhia</td>
<td>3.199</td>
<td>3.794</td>
<td>4.19</td>
</tr>
<tr>
<td>13</td>
<td>Dnipropetrovsk</td>
<td>3.26</td>
<td>3.864</td>
<td>4.38</td>
</tr>
<tr>
<td>14</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
<tr>
<td>15</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
<tr>
<td>16</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
<tr>
<td>17</td>
<td>Zhytomyr</td>
<td>4.67</td>
<td>5.194</td>
<td>5.34</td>
</tr>
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