

## THE MANAGEMENT OF THE ENERGY COMPANIES

**Ionescu Mihaela**

*Doctoral School of Social Sciences, Faculty of Economics, University of Oradea, Romania*

*ss\_mihaela@yahoo.com*

**Abstract:** *This paper aims to contribute to a better knowledge of the problems of energy services provided that both the international economic literature and in the Romanian, it continues to be addressed in a low position. Therefore, the author examines energy services through mechanisms that can be saved primary energy and final energy in the context of declining energy reserves worldwide. Economic and financial crisis and the current recession contribute to preventing the development of the energy services market and solutions on the framework conditions of political, economic, legal and financial aspects of energy performance contracts associated with these companies. Some Member States have already established a system requiring the national energy industry to achieve energy savings, achieving positive results: there were savings of up to 6% of final energy consumption. In a system of this type, utilities are required to obtain a fixed amount of energy savings by implementing energy efficiency improvements in their clients (such as households, companies, government or housing associations) and other sectors and energy production and transport. As an alternative to savings by themselves, some systems allow utilities to purchase energy savings from other actors such as energy service companies (ESCOs). Energy saving obligations stimulate providers to change their business model from retail energy products to the provision of energy services. Energy Service Companies continues to be a key area for financing energy efficiency in the EU. In this respect, several Member States mention providing model contracts for energy services, the introduction of legislation or removing legal barriers for ESCO access to energy services in the public sector. Meanwhile, many of the measures encouraged on ESCO contain too little detail on specific actions to be taken.*

**Keywords:** *services energy, saving, management, finance, companies, energy efficiency*

**JEL classification:** *E 21*

### **1. Introduction**

In recent decades, the recent global economic crisis and the current recession, not so much talked about energy and saving it. Economic equilibrium is dependent on imported oil and gas burning them decisively contribute to climate change, and replacing them with clean renewable sources is urgently needed but sluggishly economically and technologically. So far the safest, cheapest and most affordable clean energy is saved. This has created the idea of energy conservation.

A prerequisite for an energy efficient Europe is creating value for energy savings through market mechanisms. Thus, tools are required to assign a financial value of energy savings and profits to bind utilities (suppliers or distributors) energy efficiency and not the amount of energy supplied.

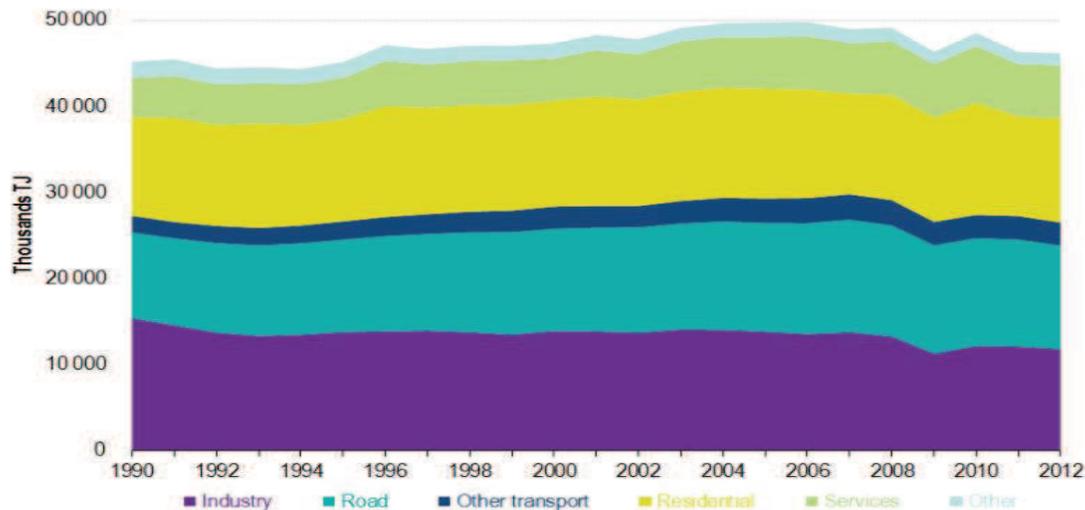
### **2. Saving energy in liberalized energy market**

## 2.1. European regulations

Energy efficiency plays an important role in European legislation. In addition to being included in the package "20-20-20", representing one of the three targets achieved (20% reduction of primary energy use compared to projected consumption in 2020 by energy efficiency improvements), is also a top priority one in the European strategy for energy competitive, sustainable and secure for 2011-2020.

Hence the attention given to a proposal by the European Commission in 2011 to adopt a new Directive on Energy Efficiency (DEE), which will require the repeal of the Energy Services Directive (ESD) and Directive 2004/8/EC on the promotion of cogeneration. The Directive aims to create conditions for the development and promotion of a market for energy services and for the development of energy-saving programs and other measures to improve energy end-use efficiency.

Energy efficiency is one of the most cost effective ways to strengthen the security of energy supply and reducing greenhouse gas emissions and other pollutants. In many ways, energy efficiency can be seen as the largest energy resource in Europe. Regarding energy efficiency target for 2020 to save 20 % of EU primary energy consumption compared to projections is not legally binding on Member States. However, after several years of growth, primary energy consumption reached a peak in 2005/2006 and a slight decrease from 2007, which is partly due to the economic crisis, and increasing energy intensity (Figure 1).



**Figure 1:** Final EU 28 energy consumption

Source: Eurostat

Regarding the end-use sectors, DEE focuses on measures that establish requirements regarding both the public sector to renovate buildings owned by it and the application of high energy efficiency standards when purchasing buildings, products and services. Under this Directive, shall set national systems energy efficiency obligations, including the periodic mandatory energy audits for large enterprises and establishing a series of requirements for all domestic and industrial consumers. Directive through the actions difficulties encountered by public authorities wishing to purchase energy services by providing remote energy performance contract models to the public sector. Accounting and financial impossibility especially local authorities to pay ESCO recorded energy savings will find a solution by requiring Member States to adopt laws and regulations on procurement. From 1 January 2014, each Member State must ensure that 3% of the total

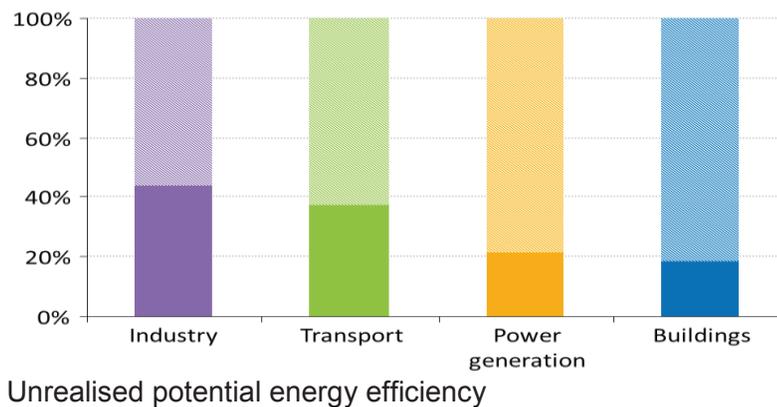
floor area heated and / or cooled owned and occupied by government are renovated annually to meet the minimum requirements for energy performance based on Article 4 of Directive 2010/31/EU. "Europe 2020 " flagship initiative includes energy, "Resource efficient Europe in terms of resource use", which incorporates the EU's determination to achieve goals 20/20/20 reducing emissions of greenhouse gases, producing renewable energy and energy savings (Table 1). However, the initiative includes requirements for completion of the internal energy market and implement the European Strategic Energy Technology Plan (SET Plan). The objective of the Europe 2020 is Europe out of the crisis with a stronger and more sustainable economy.

**Table 1: Energy consumption in the EU 28 (Mtoe)**

	1990	1995	2000	2005	2010	2011	2012	2020 target
Primary Energy	1569.7	1566.4	1617.8	1711.6	1653.6	1596.4	1583.5	1483
Solid Fossil Fuels	453.2	364.0	320.3	316.8	281.5	286.2	292.6	
Oil& Petroleum Products	549.9	563.2	567.4	580.9	521.8	503.5	483.9	
Gas (Natural&Derived)	282.4	321.1	380.4	429.7	433.2	389.7	379.4	
Nuclear Heat	205.2	227.3	243.8	257.5	236.6	234.0	227.7	
Renewables	71.2	83.4	97.4	117.2	168.7	168.7	184.4	
Other	7.7	7.5	8.5	9.6	11.9	14.4	15.4	
Final Energy	1080.2	1079.0	1131.2	1189.3	1160.0	1107,2	1103.4	1086
Solid Fossil Fuels	124.2	83.0	62.2	53.3	49.8	48.7	47.3	
Oil& Petroleum Products	446.7	464.4	489.8	505.8	458.3	445.2	430.2	
Gas (Natural&Derived)	229.9	247.2	267.5	281.2	273.0	244.7	252.9	
Electricity	186.0	194.3	217.6	239.5	244.4	239.9	240.6	
Derived Heat	54.3	45.4	44.6	52.4	53.4	47.2	48.3	
Renewables	38.1	43.2	48.1	55.3	78.1	76.7	79.4	
Non-renewable wastes	0.9	1.5	1.3	1.8	2.9	4.8	4.6	

Source: International Energy Agency

EU Energy Efficiency Plan considers energy efficiency a central element of the Europe 2020 strategy and the transition to an economy in which resources are used efficiently. Energy efficiency is one of the most cost effective ways to strengthen the security of energy supply and reducing greenhouse gas emissions and other pollutants. In many ways, energy efficiency can be seen as the largest energy resource in Europe. Plan places in order of potential energy efficiency, buildings, transport and industry; also mentions energy efficiency in public spending, the importance of financial and consumer efficiency (Figure 2).



< Realised energy efficiency potential

**Figure 2:** Projected energy efficiency potential which will Be realised by 2030  
Source: International Energy Agency

Reducing energy consumption through energy efficiency is a key priority and requires sound policies at all levels. Target to achieve 20% reduction of primary energy consumption in 2020 is an overall EU target, with no targets individual Member States (Table 2).

**Table 2:** Energy saving in the EU 28 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2020
Primary Energy	0.00	0.01	2.23	2.77	8.36	5.69	9.28	10.49	20
Final Energy	0.00	0.76	3.04	3.55	9.30	6.29	11.00	12.11	20

Source: International Energy Agency

Each Member State shall establish a scheme obligations regarding energy efficiency. Basically, until 31 December 2020, every country has to make savings in each year of 1.5% of annual energy sales to final consumers.

## 2.2. Final energy savings

Energy Services Directive requires Member States to establish and their achieve the 2016 national indicative energy savings target of at least 9% final the energy. Most of the provisions have been replaced by the more specific provisions contained in EAD. However, the requirements for the 9% will not be repealed until 2017. Though the calculations and methodology are very different, the objective DSE should be considered a step towards meeting the EU to its ambitious target consisting of 20% of energy consumption by 2020.

Therefore, the figures presented in Table 3 below can be used only as general indicator of the actual impact of EU economies.

**Table 3: Objectives in final energy savings**

Member State	Objective for 2010 terms of final energy savings		The stated objective for 2010 in terms of final energy savings		Outlook 2016 final energy savings	
	Mil.TOE	% of consumption reference	Mil.TOE	% of consumption reference	Mil.TOE	% of consumption reference
Austria	0.428	2.0 %	1.180	5.5%	1.87	8.8%
Belgium	0.789	3.0 %	1.301	4.9%	2.985	11.4%
Bulgaria	0.209	3.0 %	0.305	4.4%	1.066	15.3 %
Cyprus	0.060	3.3 %	0.066	3.6 %	0.191	10.4 %
Czech	0.355	1.8 %	0.532	2.7 %	1.596	8.2 %
Denmark	0.449	3.0 %	0.664	4.4 %	1.285	8.6 %
Estonia	0.061	2.3 %	0.079	3.0 %	0.213	8.1 %
Finland	0.507	3.0 %	1.040	6.1 %	2.123	12.5 %
France	5.000	3.8 %	5.159	3.9 %	18.000	13.5 %
Germany	12.181	6.1 %	17.937	9.0 %	33.868	17.1 %
Greece	0.439	2.8 %	0.794	5.1 %	1.415	9.0 %
Hungary	0.152	1.0 %	0.293	1.9 %	1.371	9.0 %
Ireland	0.559	4.5 %	0.523	4.2 %	1.576	12.6 %
Italy	3.066	2.7 %	4.102	3.6 %	10.880	9.6 %
Latvia	0.006	0.2 %	0.294	8.8 %	0.299	9.0 %
Lithuania	0.054	1.5 %	0.067	1.8 %	0.341	9.4 %
Luxembourg	0.045	2.7 %	0.128	7.6 %	0.238	14.1 %
Malta	0.011	3.0 %	0.014	3.8 %	0.033	9.0 %
Netherlands	0.978	2.0 %	2.278	4.7 %	6.416	13.1 %
Poland	1.021	2.0 %	3.037	5.9 %	5.779	11.3 %
Portugal	0.344	1.9 %	0.662	3.6 %	2.240	12.2 %
Romania	0.940	3.0 %	2.222	7.1 %	2.800	9.0 %
Slovakia	0.224	3.0 %	0.668	9.0 %	0.671	9.0 %
Slovenia	0.102	2.5 %	0.101	2.5 %	0.591	14.5 %
Spain	2.179	3.0 %	4.720	6.5 %	13.126	18.1 %
Sweden	2.003	6.3 %	2.846	9.0 %	4.626	14.6 %
United Kingdom	11.737	9.0 %	8.547	6.6 %	17.816	13.7 %

Source: International Energy Agency

Energy Service Companies (ESCOs) continues to be a key area for financing energy efficiency in the EU. In this respect, several Member States mention providing model contracts for energy services, the introduction of legislation or removing legal barriers that ESCOs have access to energy services in the public sector. At the same time, as noted in the first reporting period, many of the measures reported on ESCO include too few details on specific actions to be taken.

In terms of financing energy-saving measures, several Member States reported use of EU funds and the income from the sale of Assigned Amount Units under the Kyoto Protocol. Meanwhile, efforts to increase private sector involvement in financing energy efficiency improvements are increasingly numerous throughout the EU.

### **2.3. Necessity of energy companies in Romania**

Romania has made significant energy savings target the total committed to the European Commission, but the important factor in this direction was the recession and not investing in energy use. Currently, discussions are held with various stakeholders to assess the potential for ESCOs and energy efficiency programs in Romania. Since ESCOs have been very successful in other countries, we have every reason to believe that this success can be replicated in Romania, where there is a pronounced need of focusing on energy efficiency. Romania is not ready to deadlines imposed by the Energy Efficiency Directive. Energy consumption decreased following the reduction of industrial activity, but not increased efficiency. There are very few buildings energy efficient and no certainty of improvement for the next years. Romania thermal rehabilitation works are superficial and energy efficiency is promoted effectively through effective policies. In Romania, buildings use about 41% of final energy consumption. In comparison, residential buildings in Romania consume eight times more energy than the EU average due to inefficient heating systems and thermal insulation inappropriate.

## **3. Market energy companies**

### **3.1. ESCO organization**

ESCO is a company that provides integrated solutions aimed at reducing energy costs. This company is remunerated according to the performance of the implemented solutions. This definition refers to two essential elements that differentiate companies ESCO conventional energy consulting firms namely providing integrated solutions and the link between pay and performance. In the traditional operating mode, the client (be it a company or a public institution) who wants to implement an energy efficiency program, must go through several stages and come in contact with: designers, financial institutions, equipment manufacturers, contractors, suppliers. On complex projects may cause problems due to the large number of parties. If a change occurs, have resumed contact with all parties involved, which leads to long achievement. If the workings of the whole project ESCO companies are treated with a single entity for all components and all stages. Working with a single intermediary helps reduce costs of implementation of projects, expenses are often significant barriers to implementation of energy efficiency investments.

### **3.2 . Services provided by an ESCO customers**

#### **3.2.1. Analysis of energy consumption and energy audit**

An essential component of the package of services offered by ESCO is detailed analysis of the energy consumption and achieve an energy audit, which allows to identify possible energy savings. If an energy consultant considers energy analysis as the final product for ESCO companies this is only the first step in the project.

#### **3.2.2. Energy management**

ESCOs services firms can sometimes be limited to conducting an activity of "energy manager". Management of energy consumption, using external sources allows client company or organization to benefit from the experience of specialists without requiring additional staff and focus on core business.

Energy management services generally involve equity modest ESCO reduce costs by providing improved systems of management and not the installation of expensive components.

### 3.2.3. Design and implementation of the project

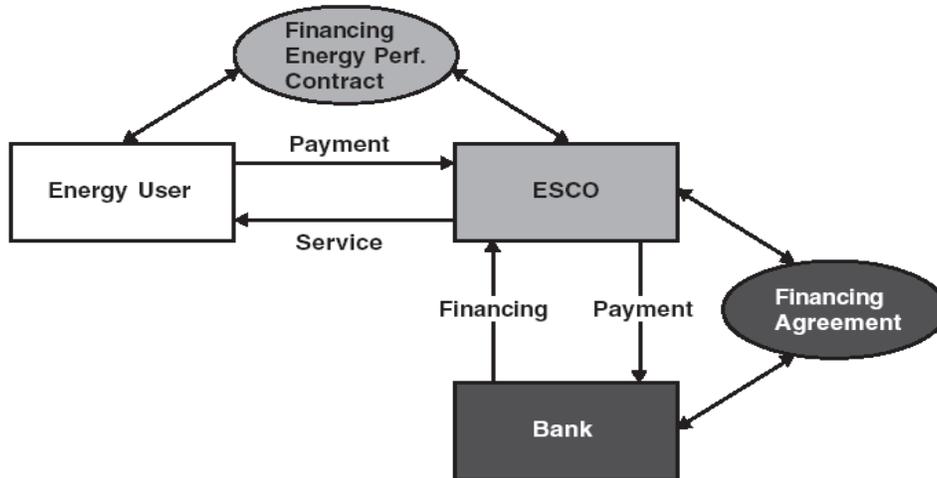
In many cases the relationship between an ESCOs and its customers are focused around a specific project that is deemed most likely to offer big savings in energy consumption. A typical example is the replacement or modernization of the heating and lighting in a building. In such a project, ESCO assumes responsibility for designing, defining technical specifications, procurement and installation of equipment. ESCO will oversee maintenance of equipment installed for a certain period of time.

### 3.3. ESCOs financing

#### 3.3.1. Traditional financing facility

An important role that ESCO and frequently assume is participating in the development of a funding mechanism for the project. Even if sometimes ESCO has no direct role in the contract, the borrower is not the end customer ESCO, ESCO guarantee performance by increasing confidence in the bank's proposed project.

ESCO financing package will be negotiated by conventional, consisting of a combination of self-financing from its own resources the client along with a classic loan from a financial institution. ESCO involvement in the development of the negotiation of the loan can lead us to obtain better financing conditions to the situation in which the client would apply directly to obtain financing (Figure 3).



**Figure 3:** ESCO financing  
Source: Energy Service Company

#### 3.3.2. Funding "by third party"

Unlike models financing traditional funding model "by third party" (TPF-Third Part Financing) ESCOs companies promoted an alternative solution for providing the resources needed for the project. ESCOs can invest their own money or call a loan in its own name. Customer may cover part of the costs from their own resources but has no additional financial risks. To protect the obligations from the client, ESCO will retain ownership of the equipment during the contract period.

### 3.3.3. Monitoring and evaluation of savings

Since ESCO remuneration is linked to performance of the project will conduct periodic monitoring and evaluation of the savings achieved. ESCO will be paid according to results achieved in operation.

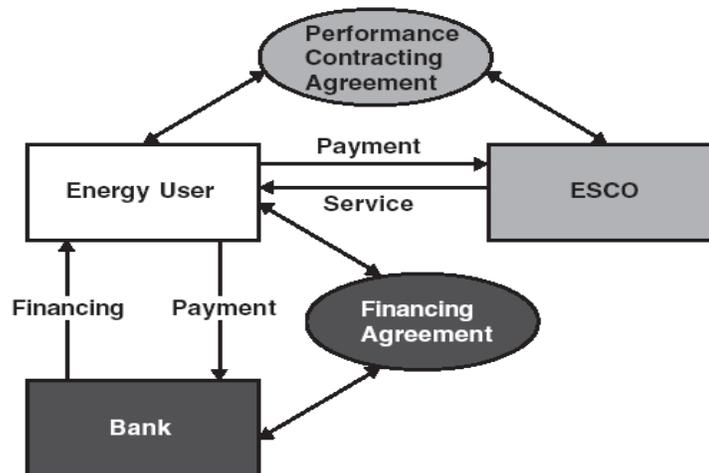
## 4. Model contracts

A second crucial component in defining an ESCO is the link between pay and performance project. Guarantee savings is by contract between the ESCO and the client. A contract with guaranteed performance can be defined as an agreement whereby ESCO offers complete or partial resulting in energy savings within a building or a company, to ensure that the savings from the project will be sufficient to repay all the costs of implementing the program in a certain time.

It is important to note that this contract is not only a simple guarantee correct operation of the equipment, but that ESCOs guarantees that the energy efficiency measures recommended and implemented will reduce energy expenses up to a certain level. ESCO guaranteed level of savings is greater than the financing costs of the project and ESCO charges. Therefore the client is assured that since the project implementation, energy costs will be reduced and he will be eligible for a portion of these savings.

### 4.1. The contract with guaranteed savings

This specific contract, the ESCO guarantees that the implementation of energy efficiency measures will reduce energy costs the end user until a certain level. Normally the project will be designed so that the energy savings to be greater than the ESCO expenses and financial expenses related to the project. Client markers right from project implementation financial benefits. In the early years, the period for reimbursing the external loan, the savings are smaller. Of course that after completion of the contract period between ESCO and customer resulting financial benefits will be fully allocated client. If savings do not reach the level specified in the contract, the ESCO is responsible for the differences and to ensure customer payments to cover the difference (Figure 4).



**Figure 4:** User financing

Source: Energy Service Company

If the guaranteed savings exceeded, the excess returns ESCO. Through this contract the customer is protected from the risk of failure estimated performance. With guaranteed

savings contract, the ESCO is responsible for the risks involved in project performance, so it is normal to reduce risks of bank credit. Funding is ensured by "third parties"; funding responsibility lies with the customer directly.

#### **4.2. Share savings contract**

Share savings contract shall distribute the monetary savings from the implementation of the project between the ESCO and the client according to a formula agreed by contract. If the project generates greater energy savings and financial so than it was expected, both the client and the ESCO receive extra benefits and vice versa, if the savings are small, both sides lose. Since the customer support part of the risk involved in project performance, it is not normal and it should bear all the financial risk. So this contract is often tied funding provided by the ESCO.

#### **4.3. Potential clients ESCO**

In principle, the ESCO can work with clients in all market sectors. However, in practice, are some barriers that should be taken into account for each sector.

- Individual residential market: it is generally seen as a market more difficult for companies ESCOs contracts due to be agreed with each customer. The costs are very high if you need more low-value contracts negotiated;
- Public and Institutional Market: ESCOs firms representing interest due to low financial risk and the existence of a large potential energy savings. The concept of guaranteed savings contract may become an attractive mechanism enabling public institutions reduce energy costs and financial benefits that can be used in the local community;
- Market Trade office buildings and large spaces, hotels, are attractive because of the potential for energy savings. Owners of such places not often benefit from competent technical resources necessary for the realization of such projects;
- Industrial market: in most countries, large companies seem ideal clients. However, these companies are sometimes large enough to have energy specialists in their staff can achieve energy efficiency projects without outside assistance. ESCOs companies can thus find as industrial targets SMBs that do not have internal technical and management resources to implement an energy efficiency program.

### **5. In conclusions**

In practice, the implementation DSE generated above all, measures aimed at final energy consumption, for example, the renovation and refurbishment of buildings. Energy efficiency plans of Member States shows that so far yielded high levels of energy savings to end users and the indicative target of 9% for 2016 will be exceeded in a great extent by most Member States. This is encouraging and shows that the commitment of Member States has produced results in terms of energy savings. Progress should continue to meet the ambition of the EU for 2020, which is to achieve energy savings of 20%, the concrete and implementation of EAD, which is an essential tool for achieving this goal.

Uncertainty, lack of knowledge, lack of awareness, and confusion regarding processes and contractual provisions relating to energy service companies (ESCOs) and energy performance contract (EPC) are widely recognized as key barriers to further market development according to a study conducted at European level.

To develop the energy services market has been considered the legislative transposition completion energy services directive, the inventory of public buildings, which facilitated ESCOs marketing companies, the introduction of certification schemes for providers of energy services, auditors, installers, which increased the level of confidence of local authorities and other categories of energy consumers. Have encouraged energy providers

listing and dissemination of information on available financing mechanisms for energy services.

At the present stage it is difficult to predict the pace of development of ESCO, and the improvement of local authorities' capacity to organize and to bargain auctions CPE. Achieving NAPs is needed is a critical mass of public sector investment, and if the energy market catalog will not meet these requirements will be assessed other options to stimulate this market, as the European experience.

It recommends that a central entity for preparing tenders in the public domain, able to deliver packages large projects with a large amount of investment, cash flow, respectively attractive to large companies ESCOs creation of a public, making ESCO subsidiary in energy companies. It is also advisable efficient lighting program in all schools in Romania, using the method of external financing payment of energy saved after program implementation system (ESCO). One such program was also implemented in other EU countries has a great educational impact.

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