MECHANISMS OF ENERGY EFFICIENT PROJECTS' FINANCIAL SUPPORT BY INTERNATIONAL FINANCIAL INSTITUTIONS IN UKRAINE

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Abstract. The financial support of the energy efficient projects in Ukraine due to the financial support provision by the international organizations is examined in the article. The financing system of the projects on the energy efficiency rise, funded by the international financial institutions, has been studied. The sources and methods of the energy efficient projects' financing have been analysed. The comparative analysis has been performed to highlight the conditions of the energy efficient projects' financing by the international financial institutions in Ukraine.

Keywords: energy efficiency, energy saving policy, financial support mechanisms, international financial institutions, methods of the energy efficient projects' financing in Ukraine.

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Introduction

The key condition for the successful implementation of the energy efficient projects is the sufficient funding. According to the Strategy of Ukraine for the period till 2030, it is provided to spend 1045.0 billion UAH on the energy saving. But in the previous years, the target values of funding have not been reached in Ukraine. In terms of the investment plan to spend 30 billion UAH on the energy efficient projects, only the amount of 10 billion was used, and only 5% of the above sum have come from the state budget. This situation can cause the total dependence of all sectors of our economy on energy resources. The state and local budgets of the country in the current financial situation cannot cover even 10% of the planned measures. Therefore, to implement more energy saving projects, we have to seek for help of the international financial donors that will be able to intensify the economic growth of our country.

The sources formation of the energy saving measures' funding is the basis for the successful implementation of the energy saving policy. The investment into the energy efficiency is often understood in Ukraine as the improvement of the existing system: insulation (modernization) of buildings, new equipment of boiler stations, implementation of the alternative and renewable energy sources, etc.

Particular attention should be paid to the use of the energy saving technologies and techniques in the new buildings construction that will ultimately optimize or reduce the energy consumption (Information of Bevz V.V.).

Basic Material

Defining the scope and sources of funding should be based on the investment project's data, which should contain the determined structure of the project, target indices of energy efficiency, project suggestions, estimated costs and resources saving. It is advisable to determine the possibility of the co-financing attraction from multiple sources. For example, the available own budget funds can be used to finance the project development, energy audits and project management, but the borrowed funds or grants can be used for the implementation of the project.

In addition, enterprises and organizations should decide for themselves how valuable for them the "deep" projects are, involving larger investments and longer payback periods, but in future providing more significant savings. Sometimes the projects that promise a quick payback, may, at first sight, seem more attractive, but in future it may happen that they are not justifying either the related transaction costs or the time spent on them. This decision depends not only on the size of the benefits, but also on the strategic goals of the project.

The energy efficiency projects can be financed by using various mechanisms and through various sources (funds receiving entities), but all the spending units should act in the concert with each other in terms of the technology or methodology. Therefore, the important role here is played by the agreed action program, at least at the regional level, and the creation of the infrastructure elements, such as the information and advisory centres of energy saving (Information of EU-ASE: Alliance to Save Energy).

The following table provides an outline of the existing mechanisms that could be used to finance the energy efficient companies.

Table 1

Funding Mechanisms of the Energy Efficient Projects
(Information of EU-ASE: Allianceto Save Energy)

Finance mechanism	Used for:	Available for:	Advantages	Drawbacks
Local/ State budget funds	All types of projects	Local/state authorities	Independence in taking decisions	Insufficiency of funds; may turn to be unavailable for the large-scale projects
Preferential credits	Use the lower interest rate than the market one, to reduce the cost of the loan funds' attraction	State, banks (sometimes within the frame of IFI), loan funds, supported by the international and multilateral organizations.	Grace period of interest payment, longer credit payment period	Public utility companies do not know particular procedures and requirements of the organizations
Commercial banks' credits	Granted to enterprises and organizations by banks, credit	Local and foreign commercial banks	Can be received faster, than funds, linked to the state or donor programs.	If an enterprise or a company is not solvent, credit guarantees will be

Finance mechanism	Used for:	Available for:	Advantages	Drawbacks
	unions and finance companies with the market interest rates			required
Grants	Granted by IFI, through local and international SPA, international development agencies, responsible for implementation	Authorities (central and local); donors (linked with the particular development promotion programs); state-owned banks (to promote commercial financing and to open the market of the energy efficiency financing)	Do not require any payback, less strict criteria of projects selection	May delay the process of the energy efficiency commercializing
Partial credit guarantee	Providing credit in case of the Borrower's default	Special guarantee mechanisms, sovereign guarantees provided by the state.	Possibility occurs to receive credit from a financial institution, that in a reverse situation would be unavailable	Labour-intensive procedure of the finance documentation preparation
Performance contracts	Projects, providing money savings, sufficient to perform payments on the project due to the energy consumption reduction	The contract, concluded between the enterprise and the energy supplying company, for example, the energy service company (ESCO), EU Energy centre, SPA or an advisory company. Funds can be attracted through the local self-government bodies, a services supplier or through a third party.	An enterprise, in this case, does not require any opening capital to finance the project at the initial stage.	Money savings due to the project should be shared with the services supplier. A sufficient number of devices is required for measuring energy resources, used to determine the basis and to monitor the savings, grounded on the comparison with the basis.
Lease	Permits firms to receive assets lease with their further buy-out without using credit	Private companies willing to lease out their energy-supplying assets. Equipment manufacturers and sellers willing to enter the market.	Payback period from 3 to 20 years; equipment is used immediately and it can be paid later on; funds are released for another purposes.	Besides the payment for the equipment use, the additional lease payments are performed.
Supplying company's credit	Buying the equipment, enterprises pay for	Suppliers of equipment	Helps create a credit reputation if an enterprise is not	

Finance mechanism	Used for:	Available for:	Advantages	Drawbacks
	it during a short-term period.		solvent; it is easier to receive it than a bank credit; it is broadly recommended by the suppliers; the interest is absent	
Revolving fund	Accumulates money savings due to the projects' energy efficiency for self-financing of further investments into the other energy efficiency projects.	SPA, state authorities, international donors	Self-sustainability after the primary capitalization	Legislative and institutional barriers raise difficulties for the budget organizations to accumulate money savings

International financial institutions (IFI) such as the World Bank (IBRD and IFC), European Bank for Reconstruction and Development (EBRD) and the Asian Development Bank (ADB) also support Ukraine.

MFU supports public sector's projects with the benefits in terms of the energy efficiency, using the following tools:

- debt financing (denominated in dollars or euros or, in exceptional cases, in local currency);
- funds investment into the equity: share in ESCO or utility companies;
- technical assistance;
- partial guarantees on behalf of the state organization.

At the estimation of the energy efficiency projects, the problems, not related to the energy performance, should also be examined. The most important ones are: financial performance, non-energy benefits (e.g. environmental ones), possibility of attracting funds, whether public or commercial ones. These characteristics play an important role in supporting energy efficiency programs and in providing the documentary display of all advantages.

While using the financing mechanisms of the energy efficiency projects, let's examine the algorithm of the financial mechanisms' choice to launch the energy-saving projects with the priority for the customer, the entity of the energy saving project with the minimal dependence on the borrowed funds. (Fig. 1) (Sahno, 2013).

This algorithm is a guide for the customer, the entity of an energy saving project, where it should run the gamut from the least costly financial sources in terms of the additional payments to the most onerous compound interest of banks in order to launch an energy-efficient project.

The developed algorithm can become guidance or guidelines for the selection of financial mechanisms to launch the energy-saving projects with the usage priority of the first available and cheaper funding sources, and then the other alternatives. Another famous promising solution for business and industry is to create a system of energy management.

Every company independently selects the mechanism of the energy efficiency projects financing by means of which the given transaction will be performed, but the major aspect of funding provided by the international organizations are the requirements, being put to the projects.

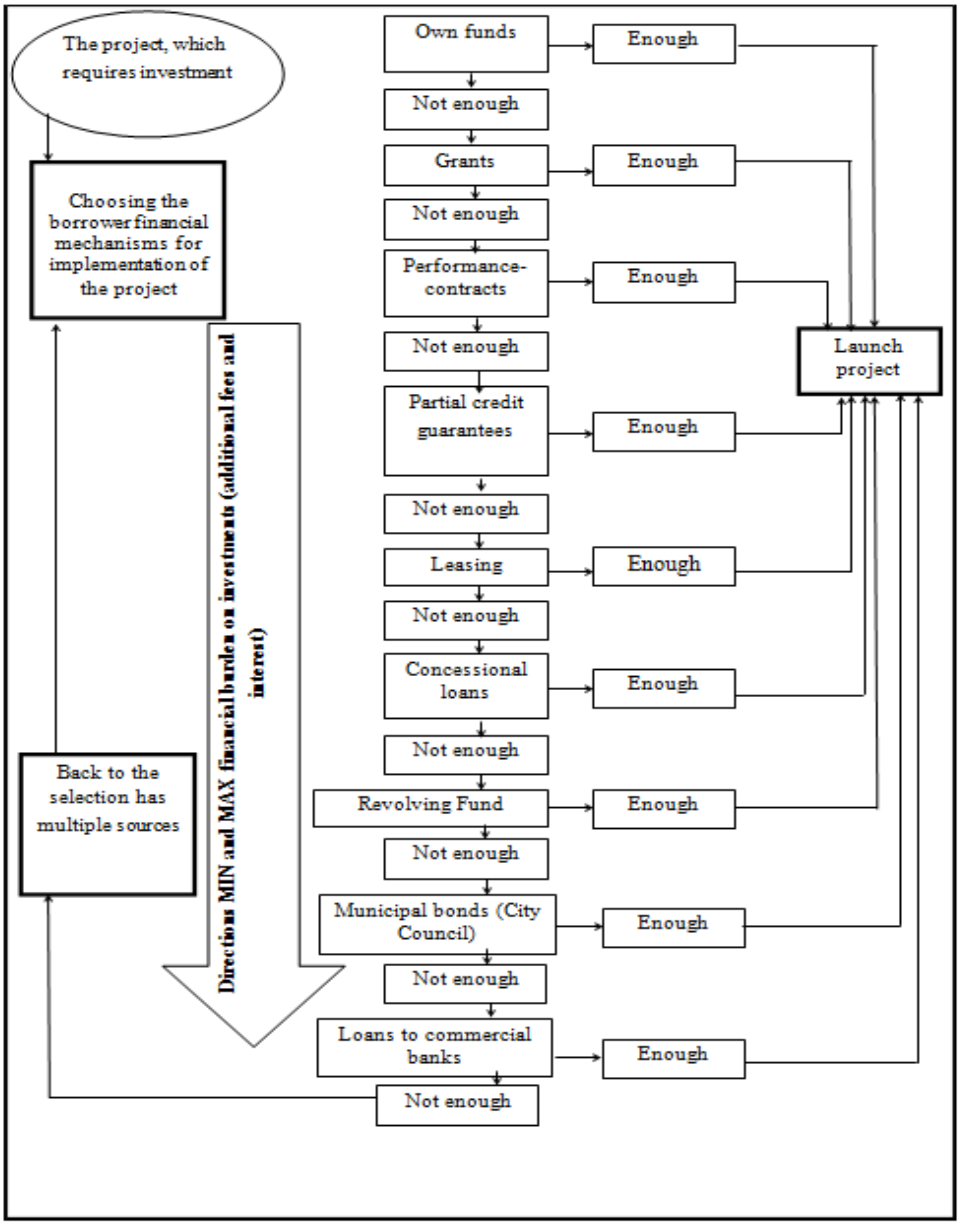

Fig. 1. Algorithm of financial mechanisms' choice for an energy efficient project (Sahno, 2013)

NEFCO

NEFCO includes three programs ("Energy Saving" credit program, "DemoUkraina" program, "Pure Production" credit program). The procedure of receiving funds for the energy efficient projects from NEFCO is shown in Fig.2.

To obtain a positive decision, there is a preliminary approval procedure, which should answer two basic questions: what are the environmental benefits; what are the financial benefits (the payback period should not exceed 6 years).

Only after the project application is deemed to meet all the requirements, NEFCO Kyiv sends a proposal to NEFCO in Helsinki for the preliminary approval. After that, the development of the detailed business plan starts, including the following certain stages:

1. Energy audit is a prerequisite to ensure that measures to be used are correct.
2. The developed Business-plan should demonstrate: compliance of social and environmental benefits with NEFCO requirements, ability to reimburse the loan.
3. Obtaining the municipal guarantees from the government.
4. Obtaining the information on the procedure.
5. Approval and permission of municipal guarantees.

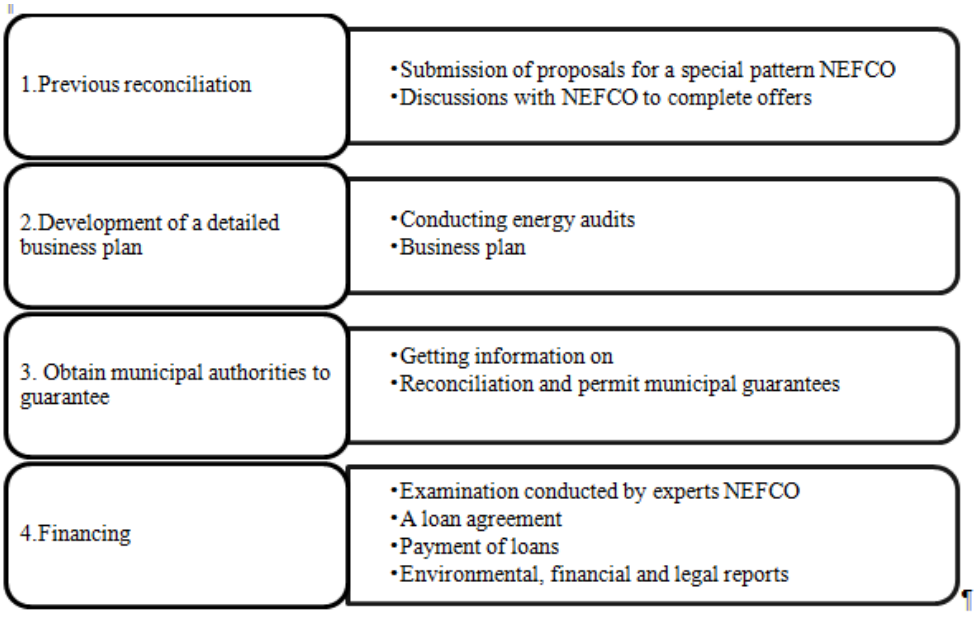

Fig. 2. Crediting stages according to NEFCO (Information: NEFCO home page)

After the business plan adoption by NEFCO and approval of municipal guarantees the financing stage is starting.

E B R D / E 5 P F u n d

EBRD is working with the large-scale investment programs in each sector (e.g. EBRD can finance water supply, drainage and sewage utility companies not only for the procurement

of pumping equipment, but it can also provide a comprehensive investment program). There is a possibility to fund the municipal solid waste (MSW) landfills if the minimum project cost is equal to 8-10 million Euros.

The critical problem for EBRD is the guarantee. Providing loans should be material, and EBRD normally requires government guarantees for the municipal loans.

The main stages of financing by EBRD are shown in Fig. 3.

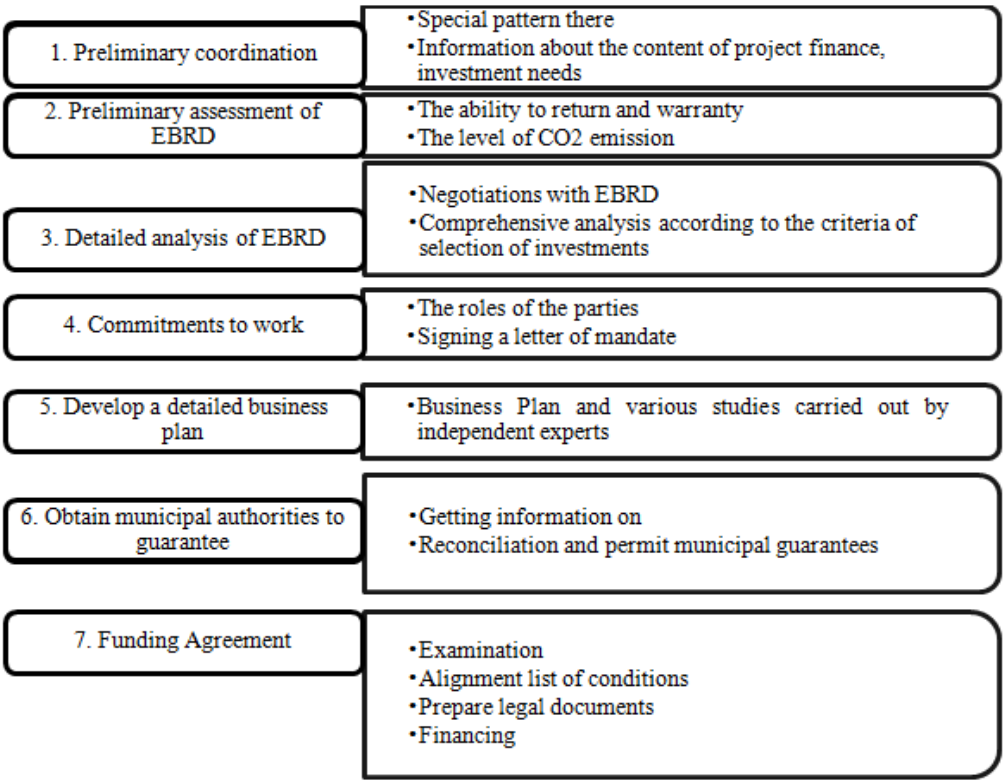

Fig. 3. Financing stages of the energy saving projects with the help of EBRD
(Information of EBRD in Ukraine)

For submitting proposals to the EBRD there is no special template. The following data are required:

1. Description of the project concept;
2. General financial / accounting calculations (if applicable):
- Tariffs
- Number of clients
- The level of fee payments
- Potential warranty
3. List of investment needs;
4. Pre-feasibility substantiation of the project, if it has already been performed (e.g. Local actions plan for the municipal solid waste (MSW) sphere, with the support of the

project "Improving the quality of municipal services» (GIZ) and the group of Luhansk region towns and districts).

EBRD estimates the following aspects:

1. Credit reimbursement ability:

- Total net revenues should exceed 8 million Euros
- Debts should be equal to less than 50% of the current income (*current income = total income - income from capital*)

2. The level of CO_2 emissions' reduction (depending on the subject matter, e.g.. at least 30% for the central heating)

3. Guarantee.

EIB/ E 5 P Fund

The Fund "Eastern Europe Energy Efficiency and Environmental Partnership" (E5P Fund) is a fund with the total amount of 90 million Euros (several donors included in a single fund), which is administered by the EBRD. It was created to promote investments into the energy efficiency in Ukraine and other Eastern European countries.

The Fund was created on the initiative of the Swedish government during the EU presidency in 2009.

The Fund complements loans for the energy efficiency projects provided by financial institutions, including EBRD, EIB, NEFCO, the Nordic Investment Bank and the World Bank Group.

Grants from the E5P fund are provided in four priority spheres: central heating, different energy efficiency projects, environmental projects in Ukraine and other Eastern European countries' projects.

In addition to promoting the principles of the energy efficiency in the projects on central heating, the Fund will also support the other investment projects aimed at achieving significant energy savings. Environmental projects in the fields of sewerage or renewable energy are also the subjects to grants financing.

Stages of EIB funding are somewhat similar to those of EBRD, but there are some differences (Fig. 4).

The peculiar feature of this international organization is the preliminary submission of a group of projects in the region.

Compliance is required with the criteria of EIB.

1. Sphere of the project:

- waste;
- water supply and sewerage;
- central heating;
- energy efficiency;
- SMEs;
- education.

2. Amount of the loan:

- The cost of a group of projects should not exceed 50 million Euros;
- The group should include 10-12 projects;
- Only 50% of the total project's cost can be financed by EIB; the rest of the project should be financed from another sources (borrower, budget, grants from donors);
- A short list of projects is submitted to Minregionbud.

3. Socio-economic criteria:
- The project should improve the quality of life;
- The project should have a positive environmental impact.

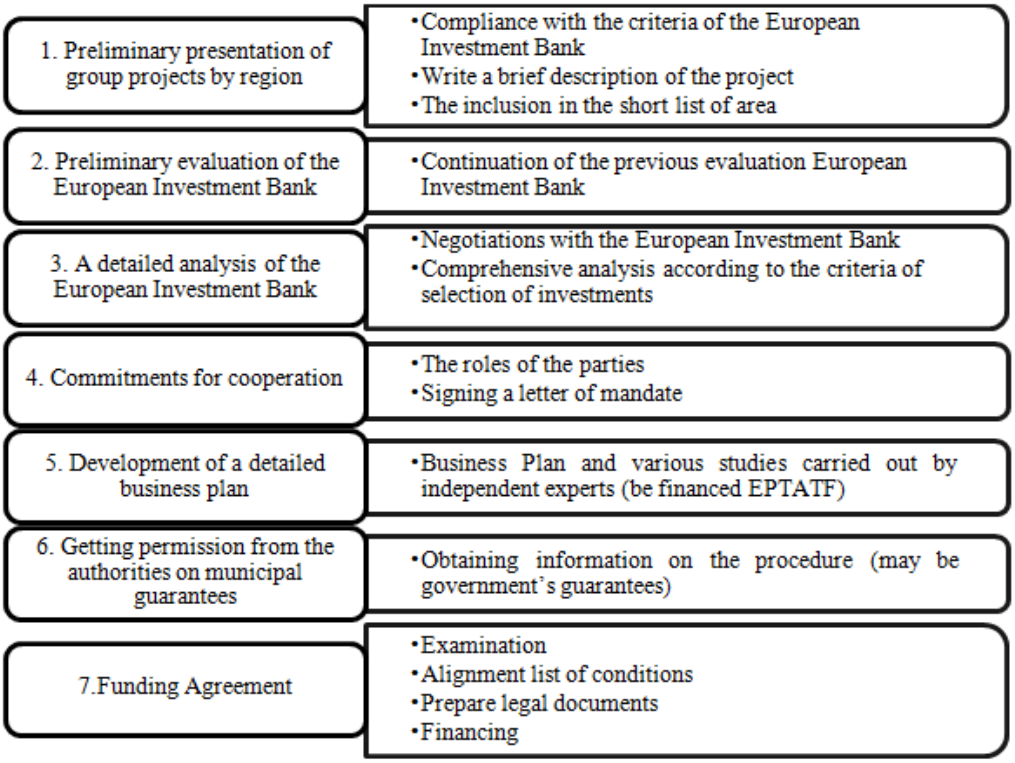

Fig. 4. Financing stages of the energy saving projects with the help of EIB
(Information obtained from E5P Fund presentation)

IFC/ E5P Fund

IFC is an investment bank and its principles and procedures are very similar to those of the EBRD.

IFC advises, conducts tenders and provides funding. There are legal aspects that limit the work with municipalities:

- amount: the loan cannot exceed the amount of two development budgets;
- currency: IFC loans in US dollars or euros, but not in the local currency;
- purchase: IFC does not recognize tenders at the city level in cases when it is required by the Ukrainian legislation; IFC requires exceptional conditions for each project.

Only inter-municipal projects in the field of MSW comply with the criteria of IFC loan amount. The two main problems are to be examined:

- Who will be the formal borrower?
- Municipal guarantees will be required from several cities (from each city participating in the project).

The steps are similar to those of the EBRD.

IFC encourages the creation of the public-private partnerships to solve the above mentioned problems.

The consideration of these international organizations in the field of the energy efficiency projects' financing permitted to evaluate the funding criteria of each organization, which is displayed in the table (Table. 2) for easier perception.

Conclusions and Suggestions

Thus, the above presented material testifies to the fact that each organization has its own priorities in the energy efficiency projects financing, each of them comprises the steps of this procedure, which have some similarities, but also differ, particularly in the amount of the provided support, payback period and the field of financing.

It should also be noted that nowadays the financing energy efficiency projects, funded by IFI, has acquired a significant importance for Ukraine. It not only promotes economic transfer to the market economy, but also stabilizes the economic progress of the country. Today there is a positive trend concerning the forecasts for IFI funding in the energy efficient projects. The performed integrated analysis demonstrates that Ukraine cooperates actively with IFI and it is this particular cooperation that will contribute to the implementation of the energy efficient projects.

Table 2

Possibilities of financing by IFI in the field of energy efficiency

		Institution/ Program	Type/ amount	Priority sectors	Criteria	Notes
1		2	3	4	5	6
LOANS						
NEFCO/E5P Fund	1a	NEFCO/Credit Program «Energy Saving»	Up to 3 million UAH, interest rate-3%.	Social sphere buildings and street illumination.	Payback period up to 5 years	Implemented in co-operation with the State Agency on Energy Efficiency and Energy Saving of Ukraine.
	1b	NEFCO/ "DemoUkraina"	Loan up to 400 thousand euros+ grant from SIDA in the amount of 300 thousand euros, interest rate – 6%, for 4 years maximum.	Central heating for the cities with the population exceeding 100 thousand people, since the end of 2011, for 10 projects.	Minimum 30%of energy saving, payback period up to 4 years, guarantees for 400 thousand euros.	Implemented with the official support of Minregionbud, decisions are taken by NEFCO and SIDA. SIDA provides a technical support for the project development (feasibility analysis, information)
	1c	NEFCO /Pure Production	Loan up to 350 thousand euros, interest rate – 6 %, for 5 years	Upgrading, repair works (any replacements, exception for the new	Payback period up to 6 years, social and environmental benefits should	Funding may be provided to private companies and municipalities. A project application template exists. New applications won't be

			maximum.	equipment).	meet NEFCO's policies.	admitted unless the already submitted ones are not processed by the employees of NEFCO.
	2	EBRD / E5P Fund	Co-financing from 12 million euros (1/3 is a grant, 2/3 is a loan), interest rate: LIBOR plus % (= < 3-4 %).	Infrastructure, including municipal services, primarily central heating (co-generation, bio-fuel, thermal air pumps, MSW).	Credit reimbursement ability, reduction of minimum 30% of CO^2 emission, warranty.	The unified application template does not exist. As a rule, EBRD first requires concept of the project.
	3	EIB/ E5P Fund / EPTATF	From 20 million euros for the separate projects, interest rate: LIBOR plus % (= < 3-4 %), up to 25 years.	Waste, water supply / sewerage, central heating, energy efficiency, SME, education.	Raising the life quality level, positive environmental effect, warranty.	There is a possibility to combine 10-12 projects, in this case the loan amount makes from 50 million euros and more.
	4	MFC/ E5P Fund	From 10 million USD (there is no formal threshold), interest rate: LIBOR plus % (= < 3-4 %), up to 12 years.	Farm business, infrastructure, energy efficiency/ pure production, finance markets.	Development of the long-term economy growth impact.	Funding can be provided for private companies and municipalities.
GRANTS						
International institutions						
	1	EC/ Various	Various amounts		Energy saving projects funded by EC	
		Other donors/ various	Various amounts		Other donors provide grants less often. Among them, USAID most often provides grant funding.	
STAGE OF DEVELOPMENT						
		ЄК / CIUDAD	Grants for the local administration bodies, from 400 to 650 thousand euros (grant from UC should not exceed 80% of the total project cost).	Environmental stability, energy efficiency, stable economic development and social inequalities reduction, Efficient managemen	Should be developed in cooperation with a EU institution and another ENP partner; other basic criteria: topicality,	A very detailed application template exists (strict requirements). 5 projects being implemented in Ukraine. The best project is the town of Ukrayinka, which was

				t and planning of the stable city developmen t.	efficiency, feasibility and stability.	named a model-town of the local authorities.
	2	State energy efficiency program	The amount threshold is not strictly determined, (the mean amount at the last competition in November, 2011, made 1.3 million UAH).	Heat pumps, electric heat-accumulatio n heating and water supply, upgrading with the use of the renewable or alternative energy sources, thermal upgrading of municipal buildings (insulation and heating equipment).	Reduction of pollution, energy saving, the short term of grant depreciatio n, the short term of the project's implementa tion.	Requires a long preparation period due to a great deal of formal requirements (the main one is that the project application should comply with the current legislation, in this case, to the procedure of Minregionbud). Project applications are to be submitted to the regional state administration. The deadline for submitting applications to the regional state administration is within 2 weeks after tendering.
	3	Minregionbud – pilot projects	The amount threshold is not strictly determined	Improveme nt of housing and communal sector's managemen t, energy efficiency in the field of housing and communal sector.	Co-financing, developed design estimate documentat ion, compliance with national, regional and local strategic programs, implementa tion within the current year, payback	Minregionbud is acting in compliance with the rules and procedures of the Ministry of Finance and the Ministry of Economic Development and Trade of Ukraine (MEDT). Project applications are to be submitted to the regional state administration.

					period up to 5 years.	In case, if the project is not completed within the current year, the Contractor has to provide an additional financing of the project at his own expense.
	4	Minregionbud – «Drinking water»	Total amount of funding for 2011-2020 makes 2.2 billion UAH, the amount threshold is not strictly determined.	Water supply/ sewerage, special emphasis being put on the drinking water's quality and sewage purification.	Co-financing, developed design estimate documentation, compliance with national, regional and local strategic programs.	Minregionbud is acting in compliance with the rules and procedures of the Ministry of Finance. Funding is provided for the state / municipal enterprises of water supply / sewerage. Project applications are to be submitted to the regional state administration. by the respective municipal organs.
	5	Derzheko (State Ecological Inspection of Ukraine) – investment agency program	Various	Reduction of the greenhouse gases' emission.	Compliance with• the United Nations Framework Convention on Climate Change (UNFCCC)	The project application template exists. The project is to be implemented within the current year. The Project should have a broad social impact.
		Kyoto Protocol program			national, regional and local strategic programs.	Approval of the local authorities on the territory of the project's implementation is required.

	6	Competition under DFSMS (State Fund for Local Self-Government Promotion)	From 100 thousand to 1.5 million UAH in dependence on the amount of population (covers up to 80% of the total project cost)	Various ones, including: -housing and communal sector's reforming, -energy efficiency in the field of housing and communal sector.	Specific conditions for each area (Toolkit for participants).	20% of funds should be attracted from various sources. Administrative expenses should not exceed 7% of the project's total cost.

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