MOBILISING LOCAL ENERGY INVESTMENTS (MLEI) - ZAGEE

WORK PACKAGE 5: COMMUNICATION AND CAPACITY BUILDING

Deliverable D5.7. Report on the possibilities of innovative financing methods

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Introduction

Project *Zagreb - Energy-Efficient city (ZagEE)* has another key specific objective to reach beside the reconstruction of public buildings: strengthening the capacity of local public authorities. The activities to be carried out as part of this work package are related to the organization of a series of interactive workshops and the preparation of studies regarding technical and financial structuring of energy renovation of public buildings. This document aims to make an analysis of existing financial models and instruments for financing energy renovation projects in Croatia as well as future models already that have already been developed in other European Union member states.

Introductory part gives an overview of potential policy instruments for supporting energy renovation that have so far been introduced in the European Union and beyond. The overview includes two categories of financial instruments:

1. Financial instruments and models that are currently available in Croatia
2. Complementary financial instruments and models that are available in the EU but have not yet been used in Croatia and can be developed for the purpose of supporting energy renovation on national/local level

As part of the review of complementary innovative financing instruments that could be used for this project but are still not available for Croatian developers, a special section regarding the role and functioning has been made for:

1. Advanced ESCO / EPC market
2. Public revolving funds for urban renewal and energy efficiency
3. Emissions markets and energy certificates
4. Securitization of loan stocks on capital markets

The final part of each analysis contains critical evaluation of proposed instruments and proposals for the development of financial mechanisms in Croatia. In conclusion, the paper describes models that were ultimately used to finance the ZagEE project.

1 Instruments of economic policy for energy renovation

International experience in the field of urban revitalization and energy renovation of buildings points to two important conclusions:

a) Only the synergic effect of several types of harmonized measures / instruments leads to significant results. Only one ideal measure or instrument does not exist.
b) Collective learning curve shows that some combination of measures / instruments are more successful in achieving the objectives of energy renovation if the projects are planned and managed in the long run.

For the City of Zagreb it is very important that the European Union has left to member states to define ways/instruments for realization of its energy targets and provides significant funding for countries to correct existing market failures (eg, underdeveloped financial / ESCO market, limits of creditworthiness of building owners).

The complexity of financial structuring of projects of this type can be seen through classification of problem areas and the most commonly used instruments of urban renovation[1] (Figure 1):

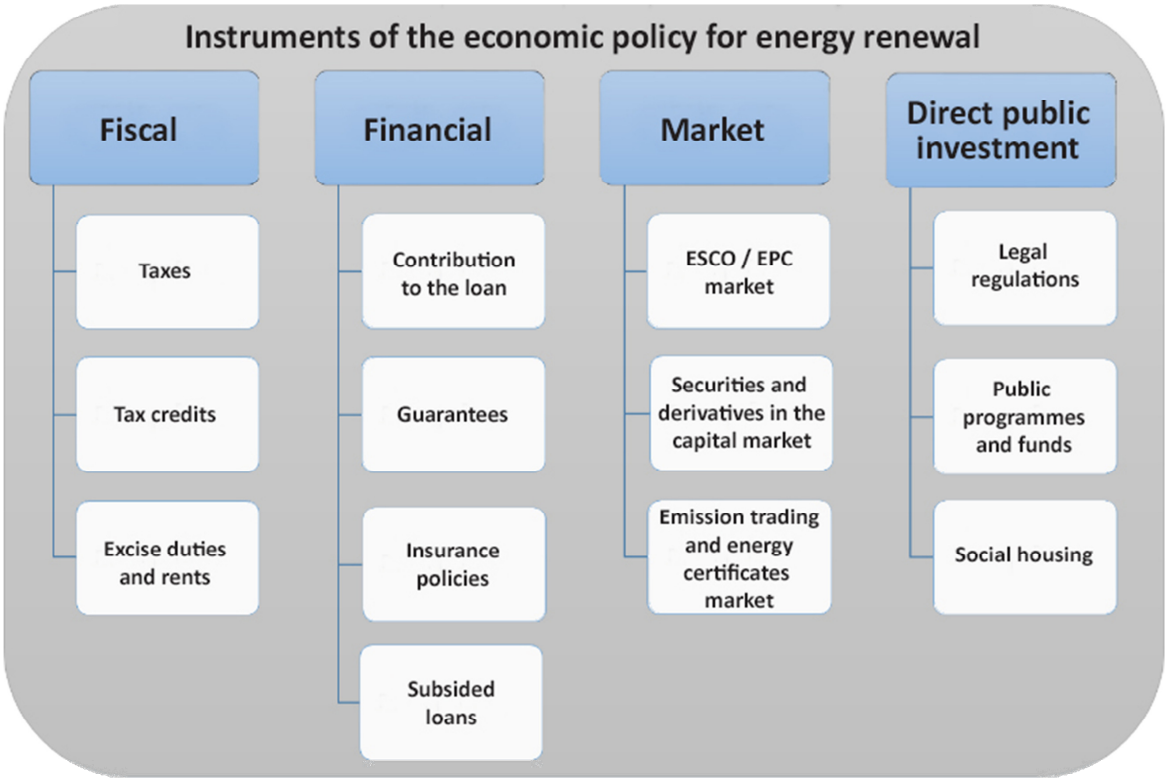


Figure 1 The instruments of economic policy in the field of energy renovation of residential buildings
Source: Arhivanalitika, 2014

[1] Adapted from: Anuschka Hilke, Lisa Ryan (2012) Mobilising investment in energy efficiency: Economic instruments for low-energy buildings. International Energy Agency (IEA). Available at: http://www.iea.org/publications/. [06.07.2014.]

1.1 Fiscal instruments

Fiscal instruments usually include differentiated tax rates depending on the energy performance of the property. They appear in the form of tax credits, tax deductions, tax incentives, accelerated depreciation rates of the property and the customs and tax exemptions. Croatia, so far, has not used fiscal instruments specifically designed for energy renovation projects.

1.2 Financial instruments

Financial instruments usually include contribution to the loan, guarantees, insurance and subsidized loans. Contributions to the loan are one-time dedicated subsidies. The most common are defined by the type of investment as a percentage of eligible (standard) cost of the project of urban renewal energy investment. The guarantees are collateral for the loan repayment. They are based on the control (impairment) of market risks that are common obstacles in project implementation. They can be used in the framework of public-private partnerships in which public institutions provide guarantees to private investors / participants of the projects in form of an incentive. Insurance policies are also instruments of risk control in the project, which are primarily used by private individuals. They are associated with the property (insurance matters and property interests, liability insurance), loans (insurance refunds or billing) or persons - the end debtor (accident insurance, life insurance). They are usually either an alternative or complement the guarantees as instruments for risk control in lending activities. Subsidized loans are forms of lending capital under conditions that are more favourable than the standard market conditions. This applies not only to lower interest rates but also to longer repayment periods than those on the market. It is common to combine them with contribution to the loan that are used to write off part of the principal, which significantly improves the terms of repayment for the end users - investors. In the energy renovation projects they are often referred to as specialized renovation loans. In addition to traditional loans they may appear in the form of leasing services, factoring and forfeiting services or hybrid products such as dedicated housing savings.

Loans are a classic form of financing that has been used for the purpose of investing in the improvement of the energy performance of buildings for quite some time now. On the market there is a wide range of specific banking products for this purpose offered by the commercial and development banks, as shown in this document. Common features of all loans of this type are related to the long repayment period, the possibilities for a grace period and generally lower interest rates compared to loans for other types of investments. The preferential financing conditions are often stipulated by financial institutions by achieving predefined energy savings. It is important to note that interest rates on loans that are significantly below market conditions, are also considered to be a form of state aid, and are subject to restrictions governed by the European Commission.

1.2. Market instruments

Market instruments have been developed for the purpose of trading in a specialized energy market, such as tradable energy certificates that are traded on organized markets (emission trading market, white and green certificates trading markets, etc.). In this group of instruments we can include market providers of specialized energy services based on the measurement of performance - ESCO / EPC market, and specific securities and derivatives which are traded on the capital market. In this group of instruments interesting energy

financial derivatives can be included[2] such as energy related futures contracts and "green bonds". They can be called like that because they are issued in order to finance green projects, but represent a general obligation of the issuer, or they can be the bonds issued on the basis of a cash flow from realized energy savings which serves as a security bond (in which case it represents a securitization which is specifically discussed in the third part of the document).

1.3. The instruments associated with direct public investments

Instruments related to direct public investments are associated with strategic investments of the public sector in improving energy efficiency and using renewable energy sources. The involvement of the public sector includes changes in legislation which introduce specific solutions for the needs of such a project (for example, investment in smart devices to measure energy and water consumption and the creation of smart grids). Instruments related to direct public investment cannot be assessed separately from financial and market instruments. Public participation or intervention in addition to creating the regulatory framework often involves the launch of funds for insurance of risks in energy efficiency projects, the establishment of a revolving fund or super ESCOs in the public domain, the financing of social housing projects and measures to eliminate energy poverty, advisedly paying higher prices for energy from renewable sources, etc.

[2] Derivative financial products (or shortened derivatives) are complex financial instruments derived from basic simple financial products. By derivatives principal never changes its owner, but only amendments cash flows can be negotiated, compensates the price difference, compensates credit risk or otherwise compensate the advantages and disadvantages of basic products from which is derived a certain derivative. Paradoxically it is mostly used in diametrically opposite purpose - or in speculative purposes and for risk-prone investors or as an instrument of asset protection for very conservative investors. Derivatives are usually classified according to the type of basic products from which are derived. So we identify:
a) credit derivatives (credit default swap - buying and selling of risk of an issuer for a particular premium; Total Return Swap - buying and selling of risk and all the influx of a claim for certain premium; Credit Spread Option - the right to buy or sell any securities if the spread in relation to the agreed criteria changes for more than the amount agreed in advance)
b) derivatives on foreign exchange (FX Forward or forward exchange contracts is fixing the prices of the course with a maturity of more than two working days. It enables the client fixing the exchange rate on a specific day in the future when the transactions for which the client protects really make Option is the right term purchase or sell a specific currency at a specific date in the future. In the case where the client more favorable market rate, the client option not be made)
c) derivatives on securities (Forward securities or futures buying and selling of securities is a contract of sale of a security in the future at a certain price, Put / Call Options - the right without obligation to sale / purchase of securities in the future at a certain price)
d) derivatives on interest rates (Forward Rate Agreement - fixing the interest rate for a specified period starting in the future; Interest Rate Swaps - replacement of cash flows from fixed / variable claims to the cash flows from variable / fixed obligations; Interest Rate Caps and Interest Rate Floors - option if interest rates rise or fall above or below a certain value to the issuer the option to pay the holder the difference)

2. Instruments available in Croatia

2.1. EU Structural and Investment Funds – ESIF

Rules of financing from EU funds require that projects, that are commercially viable (generate a quick return on the initial investment), are not eligible for financing by EU funds. On the other hand projects that have less commercial financial indicators, but have a positive social and environmental impact on the wider community are considered as eligible for EU grant financing. The analyses carried out as part of ZagEE building database showed that majority of renovation investments are suitable for grant financing. However, grants are not "free funds". This perception can lead to unjustified overuse of public funds exclusively in projects where they are available even though private sources of financing in form of public-private partnerships (PPP) also exist. EU through all its programs, initiatives and special purpose funds, aims to combine public and private sources of funds, where public funds generally have the role of "leverage" or capital that provides a smaller share of the total sources of funds, with private funding to build on. In EE projects in the buildings, EU strives to achieve the ratio of public versus private funding of 1:4. Some of the most successful programs such as the German KfW program "Energy-efficient construction and renovation"[3] has a rate of 1:10.

In structuring the sources of financing, especially financial modelling of renovation loans and accompanying measures for integrated energy renovation of buildings, a question whether it is possible to combine several different EU funds, programmes and initiatives for the same project constantly looms. The answer to this question is not straightforward, particularly in light of the fact that we are in transition from a financial perspective of the EU 2007-2013 to perspective 2014-2020. In the previous financial perspective, the answer to the question on the possibility of combining a number of different EU funds, programmes and initiatives for the purpose of financing the same project was almost rigidly negative. Following the analysis of results and experiences from the financial perspective which is at its end such rigid stance is being softened and regulations in this area have recently been partially liberalized.

A novelty in the current seven-year financial perspective is the legalization for possibilities of combining funding from a variety of public sources - including the resources of multiple ESI funds and programs and initiatives of the EU[4]. This possibility is open because of the knowledge of the need for support of complementarity and synergies that exist between projects, while avoiding overlapping, and the exclusion of double financing which remains a prohibited practice. So far, the answer to the question of combining resources is: "in principle, yes, but with some limitations". Cases in which the combination of multiple sources of public funding are possible are called complementary financing, diversified funding, a substitute or alternative financing, combined financing networks, clusters and science parks, transfer of experience between networks, clusters and cross-border programs.

[3] German state development bank KfW is the main financial mechanism to channel public and private resources to investments in energy efficiency, Germany from 2001 to now has renewed 9,000,000 building towards a low-energy and / or passive standard and for what it invested more than 54 billion €. The actual energy savings are determined according to the provisions of KfW Standard for energy efficiency in buildings, which became a byword for high energy efficiency in buildings based on "the greater the savings, the higher the subsidy". Cascade interest subsidies and technical assistance will be awarded for three levels of savings of primary energy for the construction of new buildings or 5 level for the reconstruction of existing buildings.

[4] European Commission (2014) Enabling synergies between European Structural applications: and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes: Guidance for policy-makers and implementing bodies. [online] Available at http://ec.europa.eu/regional_policy/activity/research/index_en.cfm [06.07.2014]

The biggest and most practical option for mixing EU funding can be done with financial resources of the European Structural Funds (ESIF) and the Horizon 2020 programme, which are both very important tools for achieving targets of low carbon footprint economies. The new Horizon 2020 programme incorporated several existing programmes (Intelligent Energy Europe, MLEI – PDA, FP7, Smart Cities Initiative, etc.) in order to enable centrally based the management of these programmes and achieve synergic effect. The common denominator of this structural change in the current policy and practice of public support for projects is a pivotal initiative structural and cohesion policy in the period 2014 to 2020 - "Innovation Union - European Research Area"[5] which is based on the concepts of „smart specialization strategy“[6].

Box 1 Rules and models of combining multiple sources of financing EU projects [7]

1. **No Double Financing Rule**
   Double financing is any parallel submission of the same items cost justified for financing from two or more different sources of public funds (either EU, national, regional or local) and / or private resources to achieve multiple coverage for the same item from several or all of them. This is considered fraud and the criminal offense that is prosecuted ex officio[8].

2. **Rule of co-financing or participation in financing**
   Although in some very specific circumstances, the EU can provide up to 100% of the eligible costs of a project, the general rule is that the applicant / beneficiary of EU funds must also participate in covering costs - regardless of who they are: public authorities, public institutions, companies, NGOs and citizens. In accordance with the specifics, each project is expected to first be based on feasibility studies determines the optimum ratio of public funds and private funds, and then shares the share of each of the stakeholders of the project in one of these two categories and their possible hybrid derivatives (eg, mezzanine financing). Source participation for applicants / beneficiaries of EU funds as a rule must be own funds but in some specific cases can admit and own funds procured through debt sources. In the case of the City of Zagreb that means to his participation in the equity of the project under the demanding and highly specific conditions could count the proceeds of the Loan from EIB and EIF and the release of specific municipal bonds. The Budget Act (Official Gazette 136/12; Art. 88) stipulates that restrictions on borrowing authority do not apply to projects co-financed by the programme and the EU funds and projects in the field of improving energy efficiency involving local and regional governments.

3. **Complementary financing model**
   While co-financing the same project is not possible through various EU funds because it is not expressly prohibited or not practically possible, it is possible to combine multiple resource ESI funds in complementary ways. This includes primarily the use of different sources for different activities of the same project (with separate cost estimate for the various items without duplication) that are performed in a coherent way or sequence (consecutive) way. For example, if the same project has three phases - preparation, performance and evaluation, one or two of them can be financed from various resources of ESI funds if they meet all the conditions prescribed them.

4. **Model of complementary financing**

[5] European Commission (2014), EC Initiative „Innovation Union – European Research Area“, [online] available at http://ec.europa.eu/research/innovation-union [06.07.2014.]

[6] „Smart specialization strategies" are related to the regional policy in the framework of EU cohesion policy and represent a request for recognition of priority activities that contribute most to the strengthening of regional competitiveness, and the competitiveness of member states, and the whole EU. The goal of this approach is to ensure the most efficient use of public funds, but also to encourage private capital. Smart specialization strategies should help regions to concentrate available resources and efforts on a number of related key priorities for which will give a decisive impulse to the growth and development and prevent the dispersal of funds to a large number of diverse priorities.

[7] European Commission (2014) Horizon 2020 regulations & rules for participation, PPP & P2Ps [online] avalilable at http://ec.europa.eu/research/participants /portal/desktop/en/funding/reference_docs.html, [06.07.2014.]

[8] This policy has been proven in the document "EU Structural Funds Regulations for 2007-2013," which invokes Article / Article 54 (5) of Council Regulation No. 1083/2006. Article 54 (5) - quote: "... an expenditure co-financed by the Funds shall not receive assistance from another Community financial instrument". [online] available at http://ec.europa.eu/regional_policy/information/legislation/archives_2007_2013_en.cfm [06.07.2014.]

The same user can disperse the sources of financing of the project so that he divides it to the rounded smaller project or different categories of activities which, each separately, can be financed from various resources of ESI funds depending on fitting into the rules of each of them[9].

5. **Model of a replacement or alternative financing**
   In some cases, the ERDF may financially support projects that have passed the approval procedure in one of the resources of ESI funds but the resource has in the meantime lost funds.

6. **The model of combined funding networks, clusters and science parks**
   The various partners involved in the same network, clusters or scientific parks, as well as the bodies that coordinate their actions can be simultaneously supported by a number of different EU funds. This exception is enabled because of the utmost importance to have a scientific and technological parks and business incubators to stimulate innovation and the promotion of regional development.

7. **Model of transferring experience between networks, clusters and cross-border programs**
   Experience capitalized in terms of networks and clusters and supported by a single instrument can be transferred to other networks and clusters that are funded through other EU instrument or main program of the EU. Such exchange of experience is very important for the EU cohesion policy.

The Republic of Croatia, for the period from 2014 to 2020, can count on three Structural and Cohesion funds (European Regional Development Fund - ERDF, European Cohesion Fund - ECF and the European Social Fund - ESF) and these sources can be combined as part of the ZagEE project. Although the ERDF funding for this project is of the utmost importance, ability to combine funding from the ESF exists.

Croatian National *Operational Programme Competitiveness and Cohesion* has been agreed and adopted by the European Commission in December 2014 and it is based on 11 thematic objectives of the EU Strategy 2020. One of the main thematic objectives of the Programme is the support of the transition towards the economy based on low level CO_2 emissions.

Co-financing projects will be implemented through the fourth priority axis of the operational program called *Promotion of energy efficiency and renewable energy sources*, with total seven-year allocation of 531,810,805 €. This priority axis consists of the following specific objectives relevant to the project ZagEE:

1. Support of the energy efficiency, smart energy management and renewable energy sources in public infrastructure, including public buildings and housing sector. Financial allocation for this measure is 411,810,805 €, out of which to improve the efficiency of public lighting and district heating is allocated 100 million €. Energy rebuilding public sector infrastructure is intended for 181,810,805 €, while for the reconstruction of residential buildings is provided 90 million €. The rest of the allocation is intended for projects of renewable energy sources (biomass and solar energy).
2. Development and implementation of smart electricity distribution system. Financial allocation for this measure that will demonstrate the introduction of smart grids in the two types of cities (more than 100 thousand inhabitants and between 40 to 60,000 inhabitants) amounts to 20 million €.

The indicative amount of the above funds for large cities in Croatia is around 100 million €, to which the amount of 281,810,805 € of regional non-allocated funds has to be added. Indicative percentage of non-refundable co-financing for public buildings will amount to 30%

[9] European Commission (2014) Workshop on Synergies between European Structural and Investment Funds (ESIF) and Horizon 2020, for Public-Public Partnerships, Brussels, 13th February 2014. [online] available at http://era.gv.at/object/document/1297/attach/WS_ESIF_HORIZON_2020_13_Feb_2014.pdf [06.07.2014.]

of total eligible costs, with the first call for project proposals are expected in the second half of 2015.

ESI funds can be used to structure complex, innovative financial instruments, such as revolving funds, but the Republic of Croatia has so far not foreseen the establishment of such mechanisms.

2.2. Development banks

2.2.1. Croatian Bank for Reconstruction and Development

Croatian Bank for Reconstruction and Development (HBOR) was established on 12th June 1992 by the Law on the Croatian Credit Bank for Reconstruction (HKBO) (Official Gazzette nr. 33/92). HBOR is development and export bank established with the objective of financing the reconstruction and development of the Croatian economy. The founder and 100% owner of HBOR is Republic of Croatia, which guarantees for any resulting obligations.

HBOR for financing energy efficiency projects in building sector is offering a loan and contribution to the loan programme. Loan programme for environmental, energy efficiency and renewable energy projects, was established in 2007 and is intended for investors from the private and public sector to finance investments in fixed assets that do not include the preparation of project documentation.

Terms of the loan are much more favourable than the market ones and for private entrepreneurs are considered as a form of state aid and subject to appropriate limitations. The minimum loan amount is 100,000 HRK, the maximum height is not determined. Maximum share of loans in the investment is 75% without VAT included. The grace period is possible up to 3 years, with a repayment period up to 14 years. The interest rate is variable, 4% a year or 3m EURIBOR + 2%.[10]

An additional advantage for investors is the possibility of obtaining interest subsidies from the Croatian Fund for Environmental Protection and Energy Efficiency to the amount of 2% and the inclusion in the programme of issuing bank guarantees for energy efficiency up to 50% of the loan or a maximum of $ 300,000, with a term of validity of the guarantee of 10 years.

Since 2012, HBOR in collaboration with the European Investment Bank (EIB) allows the use of the contribution to the loan under the Programme of the European Commission - Energy Efficiency Finance Facility (EEEF 2007). Contribution to the loan is worth 3.9 million € and is used to write off the loan for principal user. Loans for the financing of fixed assets have to contribute to energy savings and / or the reduction of CO_2 emission and increase the energy efficiency of buildings or industrial processes. Contribution to the loan funds are available after fulfilling the requirements of energy saving and / or reduce CO_2 emissions or by the successful completion of the investment. As part of this facility the assistance of consultants whose task is to evaluate and verify the achieved level of energy savings and / or reduce CO_2 emissions is provided.

[10] Source: HBOR. Available at: http://www.hbor.hr/Sec1406 [06.07.2014.]

The model of crediting with the writing off the principal has proved in practice to be very successful, because investors are further motivated to achieve their savings, and the course of the project have secured professional support. An additional advantage is the constant openness lines, and there is no time limit in the form of competition, and the very evaluation of proposals will be much shorter than those for the funding of EU structural instruments.

The role of HBOR in this project can be summed up with the following conclusions:

1. The conditions of the existing credit and guarantee lines are not adapted to the needs of the project of urban energy renewal of city centers, because:
    a. the repayment period is limited to 14 years, which is not enough for complex projects of reconstruction of buildings that have return on investment in some cases for more than 20 years;
    b. the share of own resources in the financing of the reconstruction project is 25%, which is a disincentive for most ESCO companies today present the Croatian market
    c. the cost of liquidity for the payment obligations of VAT on purchase of equipment cannot be financed with this credit line
    d. guarantees HBOR issues for a period of 10 years, which is shorter than the period of return on investment in most building renovation projects
2. Government announcements about the reform of HBOR in a way that it will focus primarily and solely to support the export of Croatian companies raises the question of its future place and role in the context of the projects envisaged by the third National Action Plan for Energy Efficiency. Concerns heightened by the fact that the merger of the two agencies HAMAG Invest and BICRO led to problems with the operational role of the agency, which is now called the HAMAG BICRO in issuing guarantees to ESCOs which applies to the tenders for the energy renovation of public buildings.
3. Due to the decreased credit rating of the Republic of Croatia commercial banks in foreign ownership are considering bank guarantees issued by HBOR unusable and seek their substitution with guarantees issued by the European development bank or specialized risk sharing funds such as the Risk Sharing Finance Facility (RSFF) or the Risk Sharing Instrument (RSI) managed by the EIB.

Based on the above findings it can be concluded that the contribution to the loan from HBOR is currently a favourable long-term financing mechanism of energy renovation of public buildings, and therefore a relevant option for the ZagEE project.

2.2.2. Western Balkans Sustainable Energy Financing Facility II (WeBSEFF II)

The program of financial support for renewable energy projects in the Western Balkans II (WeBSEFF II) is part of the Regional Energy Efficiency Programme for the Western Balkans, a joint initiative of Investment Framework for the Western Balkans (WBIF) and the EBRD. The program was launched in 2013, and is intended for crediting of energy efficiency and RES projects. The line connects the long-term project financing and free technical assistance to investors, or the two key components during development projects. The budget of the fund amounts to 75 million €, and is open to investors from both private and public sector. The European Union supports WeBSEFF II with 11.5 million grant intended for technical, consulting help to investors, but also for projects that achieve significant energy savings. Credit conditions and specific requirements are listed below.

Loans for EE projects are placed over Zagrebacka banka and Erstebank dd up to 2.5 million per loan, which can amount to 100% of the total investment, with the market interest rate and the repayment period which depends on the policy of commercial banks. This model also has a pre-requisite condition of achieving 15% of energy savings before the loan principal can be written off (15% of total loan).[11]

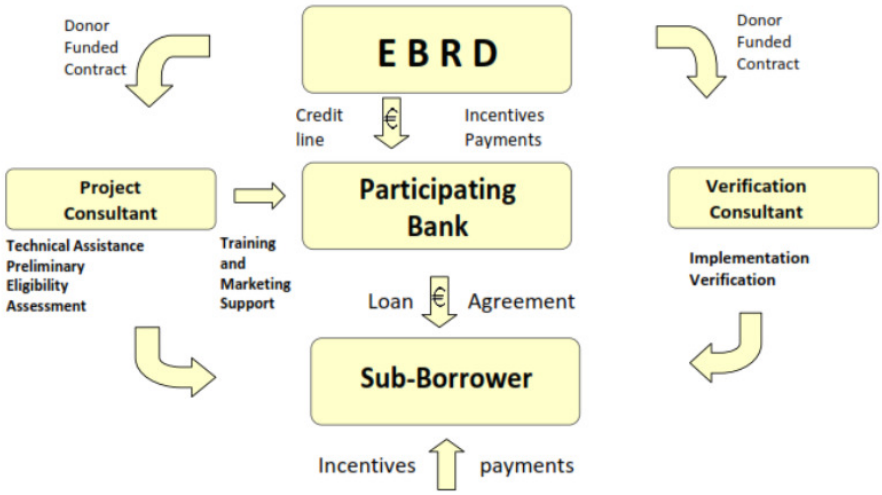


Figure 2 Scheme WeBSEFF project
Source: WeBSEFF, 2014.

Assessment of the investments is carried out by project consultants, and only long-term financially sustainable projects can be selected. The role of the consultants is reduced to a verification of compliance of the project with the given criteria, the assessment of potential CO_2 emission reductions, as well as providing technical assistance throughout the project.

The primary disadvantage of WeBSEFF II compared to HBOR loan is in the market interest rate that are ultimately closer to the cost of funding that would occur if ZagEE project would have used commercial bank loans.

2.3. National funds and programmes

2.3.1. Programme for energy renovation of public buildings

The only programme that has so far come to come to life is Programme for energy renovation of public buildings 2014-2015, which was adopted by the Government on 31st October 2013. According to the programme, starting from 1st January 2014 Croatia, as an EU member state, each year must renew 3% of the buildings in the ownership and use of the central government. It is for this reason by the Regulation on the negotiation and implementation of energy services in the public sector (Official Gazette 69/12) regulated the procedure of implementation of energy services in the public sector and thereby ensured that there is no additional building owner / user funds spending to implement measures to improve energy efficiency in public buildings through energy performance contracting and

[11] Source: WeBSEFF II, [online] Available at: http://webseff.com [06.07.2014.]

ESCO model. For the implementation of the Programme for the period 2014-2015 is in charge the Agency for Transactions and Mediation in Immovable Properties-APN (Figure 3).

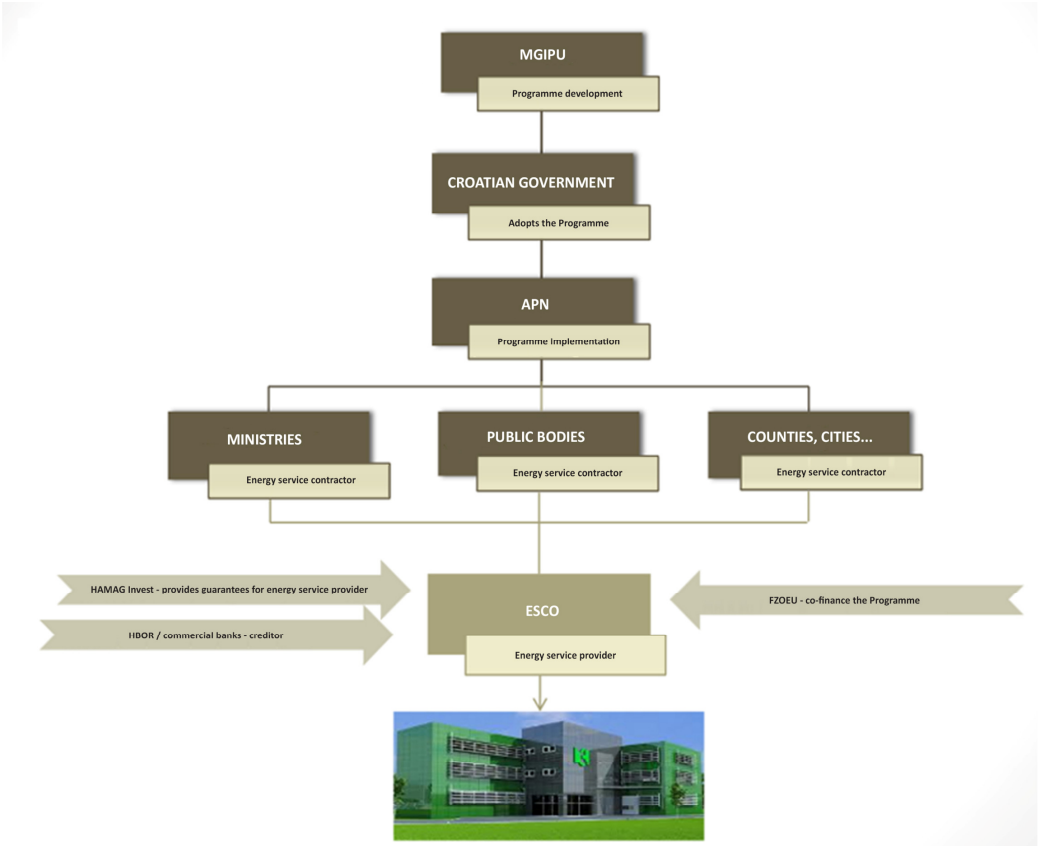


Figure 3 Scheme of Programme for energy renovation of public buildings 2014-2015
Source: Ministry of Construction and Physical Planning (MGIPU), 2014

The client orders the energy service provider and undertakes application of measures to improve energy efficiency to provide energy services. The service provider is responsible for the preparation of project documentation, construction (investment in foreign assets), monitoring and investment maintenance of all elements of the building and built-in equipment which were subject to energy renovation. The service provider invests and takes over the technical, financial and economic risks of work so that the customer service does not generate additional costs Client service is obliged to ensure payment service provider for a stipulated time period of a maximum 14 years (1 + 13). Payment services are based on realized and verified savings

In order to eliminate the risks associated with the operations of the company founder, the client of the joint venture requires the establishment of a company, which is specialized for the provision of energy services, and shall be established after the signing of the energy performance.

Croatian Environmental Protection and Energy Efficiency Fund provides grant of co-financing 40% of the eligible costs for the reconstruction of public buildings, and the funds are paid through the Agreement on co-financing programme which is concluded between APN and the Fund.

HBOR / Commercial banks approve credit funds needed for the reconstruction of public buildings under this programme in the amount of the difference between the investment of the providers of energy services and the Fund. Guarantees for payment under the loan agreement on behalf of and for the account of the service provider are ensured through programmes of HAMAG Invest to guarantee repayment of the loan amount up to 80% of the loan amount. Client services agrees to sign the agreement on transfer of receivables (contract assignment) which is primarily credit repaid to the client, but only when the savings, and in case of default by the client, the loan lender is repaid by the provider of energy savings.

In terms of borrowing, when the investments are contractual obligations of the service provider, contracting energy services under the contract concluded by the Regulation is not budgetary borrowing by local governments, which is certainly an advantage of the programme. The biggest drawback to the programme is too high technical and financial risks that have to be borne by service providers for which the final cost for the customer service is much higher than other types of reconstruction of public buildings.

2.3.2. Environmental Protection and Energy Efficiency Fund (FZOEU)

Environmental Protection and Energy Efficiency Fund was established by the Act on the Environmental Protection and Energy Efficiency Fund (Official Gazette 107/03) in accordance with the provisions of Article 60, paragraph 5 of the Environmental Protection Act (Official Gazette 82/94 and 128/99) and Article 11 of the Energy Act (Official Gazette 68/01), and began its work on 1 January 2004. The Fund was established as a non-budgetary fund in the capacity of legal persons with public authority established by the Law on Fund for Environmental Protection and Energy Efficiency. The goal of the Fund is to finance national energy programs in the view of the energy efficiency or renewable energy.

Assets of the Fund are allocated on the basis of a public announcement to the provisions of the Environmental Protection and Energy Efficiency Fund (OG 154/08 and OG 18/09), the programme of work and financial plan of the Fund (Official Gazette 183/04). The public tender shall be published in the Official Gazette, on the website of the Fund, and in the press. Users can be local and regional self-government, state institutions, companies and other legal persons, sole proprietors and individuals and ESCOs.

The main areas of energy projects financing by the Fund in 2014 relevant to the City of Zagreb include energy efficiency projects and energy audits with a view to public display of energy certificates on energy performance of buildings owned by counties, cities and commercial public buildings. According to the general criteria for the allocation of funds Zagreb has the right to receive grant funding up to 40% of total eligible project costs. Therefore this source of financing should be explored for the ZagEE project.

2.4. ESCO / EPC

ESCO stands for Energy Service Company and is the generic name of the concept of market services in the energy sector. ESCO model includes development, implementation and financing of projects to improve energy efficiency and reduce operation and maintenance. The goal of each project is to reduce the cost of energy and maintenance by installing new and more efficient equipment and optimizing energy systems, which ensures investment

repayment through savings achieved over a period of several years, depending on the client and the project.

The risk of achieving the savings typically takes ESCO company issuing guarantees and, besides the innovative projects to improve energy efficiency and reduce energy consumption, it often offers financial solutions for their realization. During the repayment period, the customer pays the same amount for the cost of energy as before the implementation of the project, which is divided into an actual (reduced) cost for energy and cost to repay the investment. After the project payback, ESCO leaves the project and all the benefits go to the client. All projects are tailored specifically to the client needs and it is possible to extend the project by including new energy efficiency measures by splitting the investment. In this way, the client is able to modernize equipment without investment risk because the risk of achieving the savings is on ESCO company. In addition, after the repayment of the investment client achieves positive cash flow over the period of repayment and long-term savings.

An additional advantage of ESCO model is the fact that during all phases of the project the customer is working with only one company and all in one place, rather than with several different operators, thus greatly reducing the cost of energy efficiency and the risk of investing in them. Projects are financed from the savings achieved, usually for a period of 5 to 15 years, depending on the client and the project, and the savings are included in the reduced energy consumption and maintenance. The basic requirement of ESCO project is to be carried out on existing buildings (reconstruction, rehabilitation, replacement or modernization), which allows the comparison of current and future energy consumption. After repayment, the client remains with all the benefits from the project.

Energy performance contracting (EPC) is a contractual agreement between the users and providers of energy services, verified and monitored during their entire lifetime, where the investment in the works, equipment and services for the implementation of measures to improve energy efficiency is included in the energy service to repay the agreed level of energy efficiency improvement or other agreed criteria, such as financial savings:

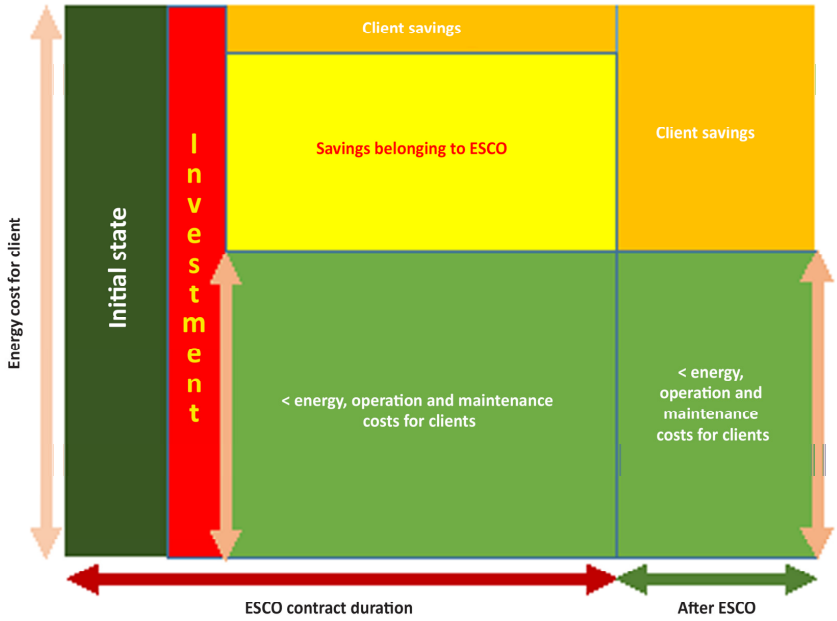


Figure 4 Energy performance contracting – general model
Source: Arhivanalitika, 2014

ESCO can use various models of repayment of the project through the savings achieved. One of the models with the least risk of repayment which is a very safe mechanism for financial institutions is "fixed repayment" based on measured and independently verified savings of the project. This model includes a fixed client repayment to the ESCO, with repayment corresponding to the amount necessary to repay debt, which is equal to the required investment.

This approach allows ESCO companies easier bank loans, or even the possibility of forfeiting transactions, and cash flow from the sale of debt to finance the project. Forfeiting pays off only when its cost is lower than the cost of the loan or lease, or when the advance payment can realize savings on investment in excess of the cost of forfeiting.

ESCO services as business models were developed in the United States of America in 70s of the 20th century as a response to the oil crisis and the rise of energy prices. But the real impetus ESCOs have experienced in the '90s and '00 onwards, with new but continuous rise of oil, gas, electricity, water and other utilities prices, as well as the availability of new energy efficient technologies for lighting, heating, ventilation, climate and the need to increase energy efficiency in buildings.

Based on the concept of ESCO services many other related models were developed - eg. WESCO - which also includes utility services such as savings on water supply or waste disposal. They were recently joined by a number of facility management companies.

In terms of implementation today we are talking about two business models – ESCO 1.0 i ESCO 2.0.

ESCO 1.0 – mainly two types of saving operating costs are achieved - energy savings and cost savings in operation and maintenance costs (O&M savings).

ESCO 2.0 – apart from these two types of operational costs savings includes the new category of generating 2 types of operating income related to the sale of "white," "green" and "CO_2" certificates, and any surplus energy produced in the open energy market.

By content 3 basic models of the Energy Performance Contracts can be differed:

a) Contract with guaranteed savings
b) Contract with shared savings
c) Contract for the delivery of integrated energy services (Outsourcing)

2.4.1. Contract with guaranteed savings

When contracting with guaranteed savings, financing is usually by the ESCOs. The payback carrier is the client and ESCO is not, but takes the risk of the guaranteed savings. Possibly achieved higher profits belong to the ESCO.

2.4.2. Contract with shared savings

When contracting with shared savings ESCO finances the project, either from their own resources or by borrowing from a third party. They take the risk and success of the project and risk of the credibility of the customer, and achieve higher profits than the guaranteed savings. It is suitable for clients who cannot or do not want to assume the obligations of borrowing capital.

Failure to comply with the guaranteed savings with this model EPC contract is completely the risk of ESCOs. The achievement of any savings surplus (greater savings of guaranteed and / or higher than the guaranteed savings due to the rise of energy prices during the contract period) are entirely those of ESCO and directed to the faster repayment of the loan or lease.

The so-called Fast Out / Fade Out is a special case of contracting with the shared savings, where instead of a fixed instalment of borrowed capital repayment plan is variable because it depends on the level of savings - greater savings achieved mean quicker repayment. Faster so-called Prepayment means lower cost of financing and successful investment and shorter duration of ESCO contracts and therefore the possibility of early entry into the revolving investment in EE in other buildings in the same program or any new investment projects in the energy efficiency and / or renewable energy of the same building.

2.4.3. Contract for the delivery of integrated energy services

These are also called "Chauffage" or "Outsourcing" contracts (franc. Chauffage - heating) which are contracting end-use of energy services, for example, the lighting based on the duration of use of lighting or heating based on the heating period. It is usually based on the long period (over 10 years). They include the transfer of equipment, investment and all related activities with users on external service providers (outsourcing).

It is a full level delegation of energy services to a specialized company committed to the principle of measuring the delivered energy. The company becomes the operator of energy processes for the facility based on the ESCO model. Obligations of the operator consist of management of power plants, investment in power plants, taking over the entire staff related to the plant to full employment while maintaining existing relationships.

This ESCO model is suitable for apartment buildings without enough precise data on overall energy consumption.

As part of the Contract for the delivery of integrated energy services an option to buy an asset can be arranged after the fulfilment of contractual commitments ("Buy Back"). It usually occurs in forms of leasing (Sale & Lease Back), public-private partnership model DBOT (short for eng. - Design, Build, Operate, Transfer) or long-term lease with the option of buying.

Table 1 Comparison of 3 contracting models – EPC

EPC model	In whose balance sheet is an investment	Who makes the operational risks	Project financing
Shared savings	ESCO	ESCO	Yes
Guaranteed savings	Client	ESCO	Yes
„Outsourcing"	ESCO	ESCO	No

Source: Arhivanalitika, 2014

2.4.4. Advanced EPC contracts

Advanced EPC contracts represent extensions of previously mentioned three models due to specific practical needs of energy efficiency projects. Three advanced models of EPC contracts are:

1. EPC Plus
2. EPC Green
3. EPC Light

EPC plus

A significant number of potential customers have a need to integrate the energy performance contracting and building renovation building measures into one service. In the classical model of EPC contracts, measures improving thermal insulation are practically excluded (due to the long period of return on investment due to the high initial investment costs) for which these models are considered to be too rigid.

Buildings that have a strong need for building renewal, in most cases are not suitable for classic model of EPC contracts. Therefore, is developed model of the EPC contracts - PLUS (EPC Plus). The reduction of thermal energy demand of the building creates synergies due to the smaller size and functional characteristics of heating installations which consequently reduces investment costs. Additional investment costs of building renovation can be calculated through ESCO PLUS but also subsidized through public urban renewal programs building.

Green EPC

The use of renewable energy is the most important part of the package of EU measures to combat climate change by 2020. That's why there was a need to find ways to expand

classical EPC contracts with measures that are used to encourage the use of renewable energy in energy efficiency projects. This 2.0 ESCO business model is specifically driven by the adoption of new legislation such as the German law on heating from renewable energy sources.

The challenge for a significant expansion of the model of "Green Energy performance contracting" is economic profitability as a result of still insufficient formal connection between measures of subsidizing energy efficiency and measures to subsidize the use of energy from renewable sources. Therefore, the technical standards, financial instruments and recommendations for best practice projects of this kind are defined under the EU Concerto programme (see Chapter 5).

Within the EU's Concerto programme has been made the biggest step forward in linking efficiency projects and renewable energy transition from direct energy consumption indicators as criteria / warranty of the project on indirect indicators of reduction of primary energy consumption and environmental changes, along the lines of using ESCO model as a tool to combat climate change.

EPC light

The third model reduces the main characteristic of the EPC - guaranteed energy savings – to a mere outsourcing measure to optimize operating expenses and investment maintenance and energy management in the building. In this model no investment in infrastructure energy efficiency is realized (construction features and / or equipment of the building). The focus is on those facility management measures that meet the objectives of energy savings.

EPC light is an adequate follow-up instrument that avoids the potential increase in the cost of energy after the expiration of the EPC contract and his re-crossing under the direct control of the investor. This model is also considered particularly suitable for new buildings that do not have specialized staff or sufficient knowledge of energy conservation and focused on fixing energy costs - typically for business complexes and shopping centres.

Croatian ESCO / EPC market is quite undeveloped. While the European Commission estimates market of ESCO services in the EU at 25 billion € and its growth in the last three years at 250% due to market incentives, Croatian market is almost completely inactive. The seed of the ESCO market in Croatia has been implanted after the formation of the first ESCO company - HEP ESCO as part of the first National Programme of EE in 2003. The company has with local governments gained it first experiences in this area of the energy-saving night-time street lighting and the reconstruction of schools. Since its establishment the company realizes fifty projects to 100 buildings worth about 150 million HRK.

In Croatia, until 2010, only 2 ESCOs operated on the market but from 2011 to 2015 more than 100 legal entities had been registered for energy certification and for ESCO projects. Fifteen of them are active in the implementation of ESCO projects, especially since the effective regulation of the Croatian Government for limited borrowing by companies owned by the government had been lifted. This regulation disabled the market leader HEP ESCO in entering into new projects under favourable conditions. Regulation changes on EE and serious implementation of national program for renovation of public buildings are key reasons for the exponential growth of interest among Croatian legal persons to enter the growing

national ESCO market. In particular, this trend has taken place among construction companies, design offices and authorized court experts for civil engineering who are also authorized to issue energy certificates.[12]

Using of ESCO model for the implementation of the project ZagEE has not been discussed in detail because within the ZagEE project main designs have been independently developed, which is part of the investment that ESCOs want to have under their control. Also, the level of cost-effectiveness of energy efficiency measures in ZagEE project is not high enough (return periods are longer than ten years) in order to be implemented through the ESCO model.

[12] Croatian ESCO companies with reference to at least one embodiment of the project at the time of writing of this paper are: Veritas Trade d.o.o, Eltec Petrol Hrvatska d.o.o., Agrokor energija d.o.o., Circom Inženjering d.o.o., Rudan d.o.o., Eko ESCO d.o.o., Planetaris d.o.o., Media Verba d.o.o., SENSE Esco d.o.o., Reflex Zagreb d.o.o.

3. Currently unused models existing in the EU

3.1. Public revolving funds for urban renewal and energy efficiency

The concept of a revolving fund was developed initially in the United States of America as an evolution of the concept of Super ESCOs. In fact in the United States the public or mixed SUPER ESCOs were created that gained revenue from energy savings reinvested in new EE projects in other buildings (eg. In Universities- savings from one faculty were being reinvested in new projects on the other faculty buildings, etc.). Revolving Fund assets received from current and / or future return of disbursed loans (net of costs) are reinvested in new projects.

Revolving fund model, during time, has went outside the scope of energy and is widely used in the health sector where the revenue from drug sales is reinvested in other health programs for the population in a given territory (eg, Bamako project in sub-Saharan Africa).

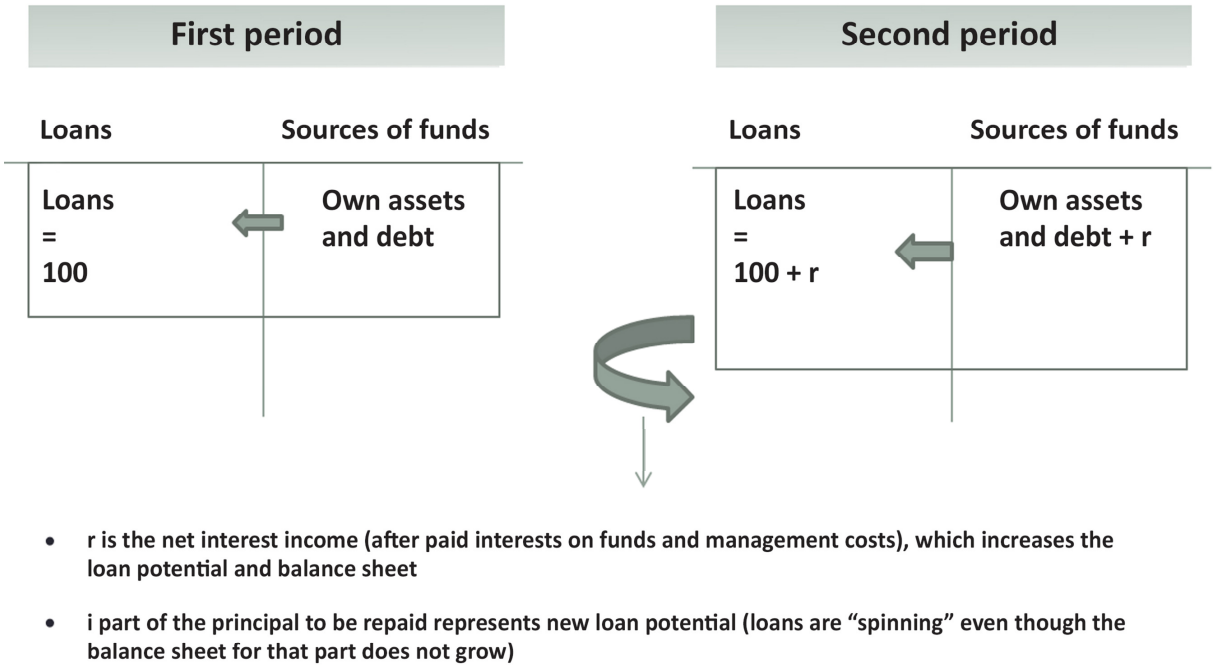


Figure 4 Universal scheme of revolving fund
Source: Arhivanalitika, 2014

However revolving funds do not represent any final solution because of their capacity of self-regenerating of limited investment capital cost of the project. What are the loans that are sold through RF closer commercial that is their potential to self-renew higher due to higher interest rates. On the other hand if they are more subsidized (either on the side of interest, either on the side of the principal) the potential investment self-renewal capital RF is lower due to low interest rates and reduced equity as a basis for their calculation.

The main reason for the establishment of a revolving fund is a discrepancy between the market supply and demand for financing of energy efficiency projects. Revolving funds these shortcomings resolve with favourable loan terms, with the possibility of realization of grants

and technical assistance in project preparation. Revolving funds can be managed by other financial institutions, including commercial banks. The credit loans approved from the revolving funds are significantly more favourable than the market because the assets are acquired at very favourable terms. Purpose of the loan is very precise and strictly defined, as well as potential users of credit funds. As the loans returned to the fund, release the funds for the issuance of new loans and thus money in continual motion with unchanged purpose.
Revolving fund for urban development focused on energy is a financial mechanism to be established at local, regional or national level, and which funds raised by interest income (by paying off the original loan tranches), benefits (for joint guarantees issued) and dividends (returns on investment of start-up capital) used to support new projects, energy efficiency and / or renewable energy.

According to EIB we have 3 models[13] of specialized Revolving funds for urban development focused on energy:

1. UDF focused on energy in buildings
2. UDF focused on ESCO/EPC in public and private facilities
3. UDF with multiple focus

JESSICA initiative is carried out by the European Commission in cooperation with the European Investment Bank (EIB) and the Council of Europe Development Bank (CEB) in order to promote sustainable development, growth and employment in urban areas of Europe. It offers support for sustainable urban development and renewal through mechanisms of financial modelling. Member states of the EU may decide to invest part of their allocated funds from the European structural funds in revolving funds to contribute to the multiplication of (re-use) financial resources from public funds by attracting private capital and thus accelerate and strengthen investment in urban areas of Europe.

Contributions from the European Regional Development Fund (ERDF) are allocated funds for urban development, which invest them in public-private partnerships or other projects included in integrated plan for sustainable urban development. Investments from the ERDF contribution can be in the form of equity, loans and / or guarantees, ensuring the possibility of credit funds under much more favourable conditions than those in the financial market. Commercial and development banks - partners, can be found in the role of manager and investor, and revolving funds. Banks typically perform a credit check, and investors bear the risk of partial loan repayment. In the formation of the budget revolving fund account is attracting up to 4 units of private funds on a single unit of public funds.

Governing bodies of the EU funds can decide that resources can be diverted to smaller funds for urban development (UDF) or holding funds (HF). The formation, operation and evaluation of the effect of revolving JESSICA funds are detailed in the manual[14] of European Investment Bank, to which the European Commission has transferred its management rights over the financial instrument investment in urban energy efficiency.

[13] Eurpoean Investment Bank – EIB (2012) Energy Focused Urban Development Funds - Final Report, ARUP [online] available at na http://www.eib.org/attachments/documents/jessica_energy_focused_udf_final_report_en.pdf

[14] European Investment Bank - EIB (2010) JESSICA : Holding Fund Handbook, [online] available at http://www.eib.org/attachments/documents/ jessica_holding_fund_handbook_en.pdf [6.7.2014.]

A simplified diagram of the functioning of the JESSICA revolving fund is shown in the figure below.

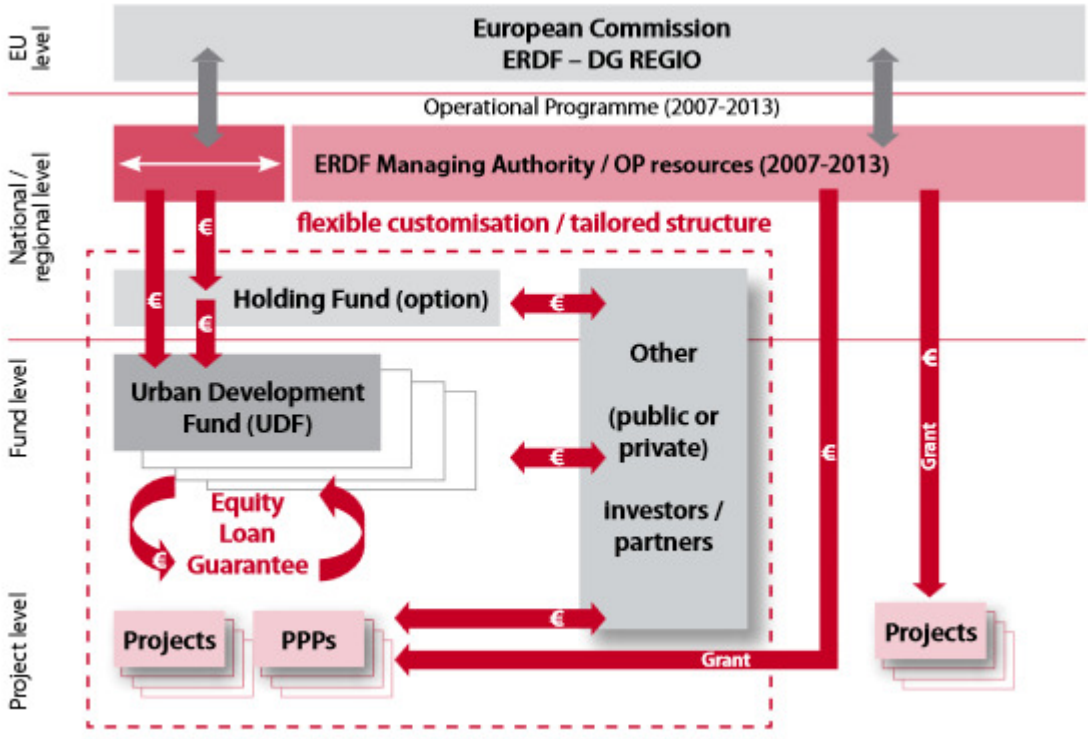


Figure 6 General scheme of the functioning of the JESSICA revolving fund
Source: EIB, 2014

Basically there are two basic derivatives of JESSICA funds for urban development - with or without a Holding Fund, which serves as a "fund of funds" or management holding.

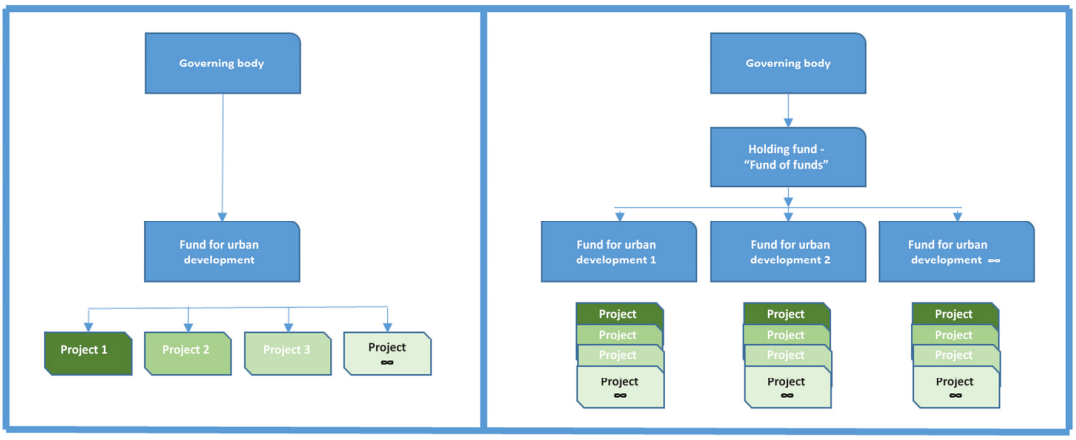


Figure 7 Models of organization of JESSICA funds for urban development
Source: Arhivanalitika, 2014

According to the typology of the type of projects they are involved in, considering the life cycle of urban goods / property / unit, there are 5 types of JESSICA funds for urban development [15]:

1. UDF – specialized in the development of sites / neighbourhoods
2. UDF – specialized in the development of projects / neighbourhoods
3. UDF – specialized for utilization / optimization of the use of city neighbourhoods
4. UDF – specialized in urban renewal and reconstruction of city neighbourhoods
5. UDF – multiple purposes

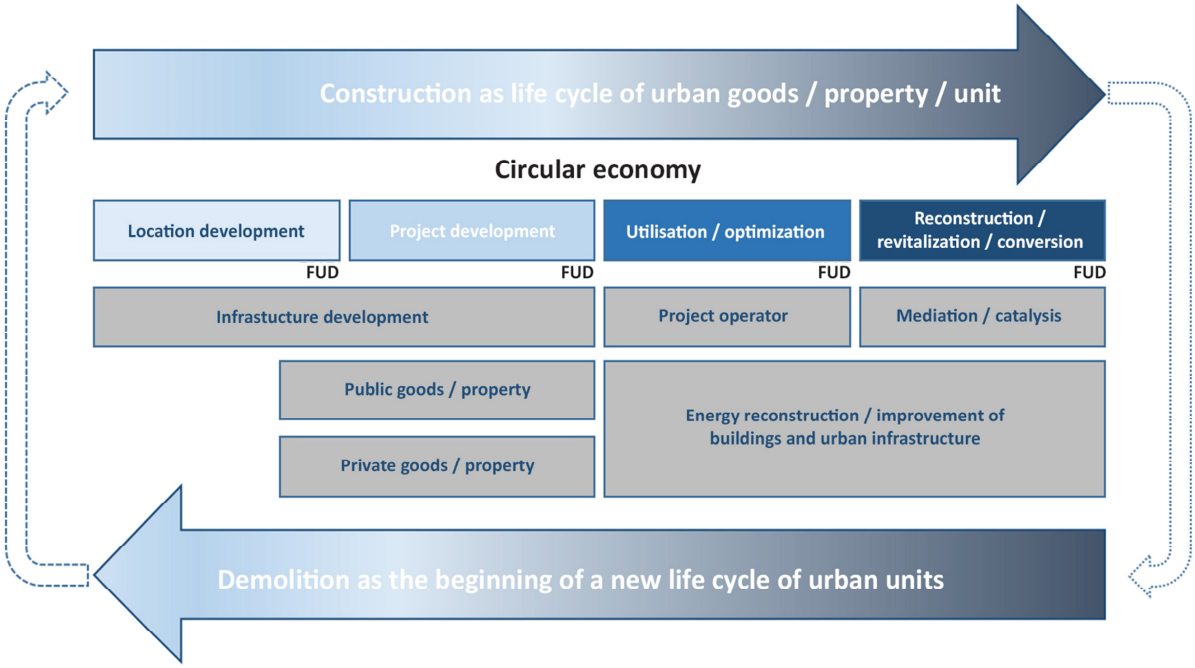


Figure 5 Funds for urban development according to life cycle phases of the urban units
Source: Arhivanalitika, 2014

Selecting the projects, their thematic mix, spatial coverage of the economic parameters (the ratio of internal and external / economic rates of return on capital - IRR and ERR) are key dimensions of business strategy of FUD because they determine the cash flows and the effects that it produces. Interrelations between those 4 dimensions are shown in Figure 9.

[15] European Investment Bank - EIB (2012) Urban Development Fund Handbook – Horizontal Study, [online] available at http://ec.europa.eu/regional_policy/thefunds/instruments/doc/jessica/jessica_udf_handbook_final_report_120712_en.pdf [01.08.2014.]

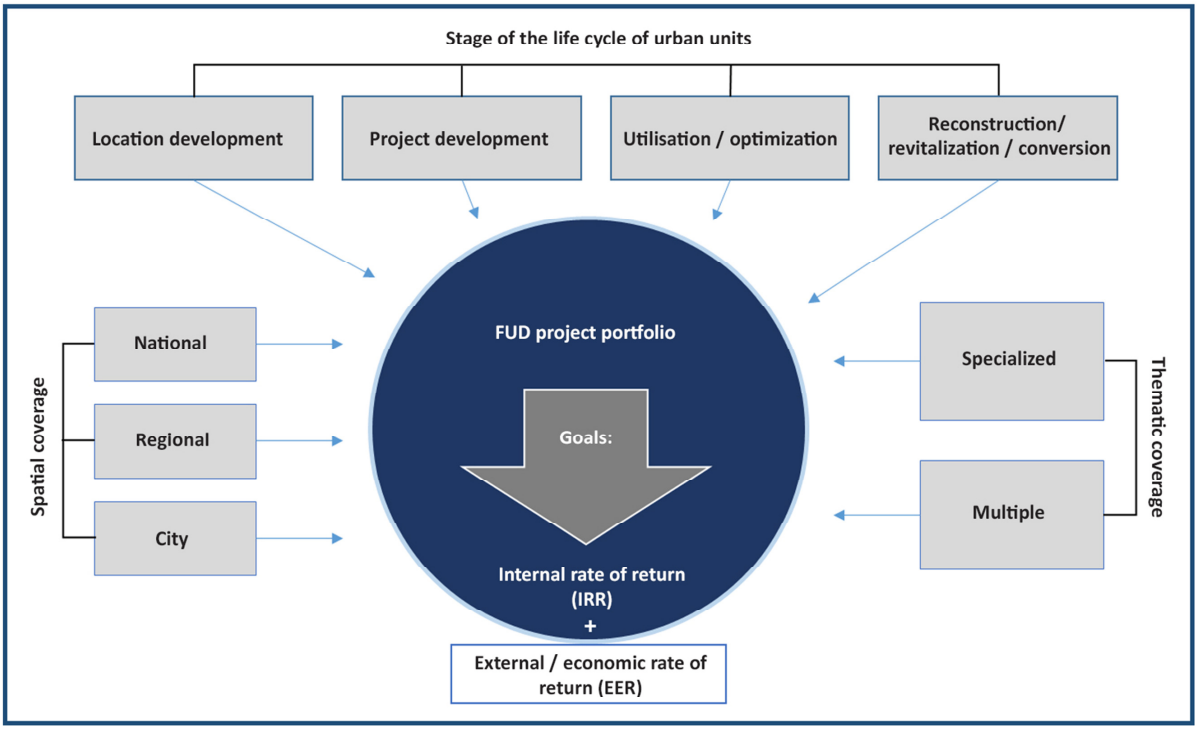


Figure 6 The four dimensions of the business strategy of the Fund for Urban Development
Source: Arhivanalitika, 2014

All funds for urban development - regardless of the type of project, for which they specialize, must meet certain target values of IRR (internal rate of return) and ERR (economic rate of return). While the target internal rate of return (IRR) is directly dependent on its costs and control structure, the nature of real estate and / or infrastructure units to which it refers also plays an important role.

Typically the UDF will focus on so-called Category B of investments from CABERNET classification[16] which is officially recognized by the EU and the methodology originally developed for urban revitalization of existing urban built units („brownfield investment“).

[16] CABERNET (Koncerte Action on Brownfield and Economic Regeneration Network) is a European Expert Network dealing with the multidimensional problems of urban revitalization of existing urban entities. It was officially accepted throughout the EU policies related to urban development in 2007 and applied until today. According to European Investment Bank - EIB (2010) JESSICA – UDF Typologies and Governance Structures in the context of JESSICA implementation, [online] available at http://www.eib.org/attachments/documents/ jessica_horizontal_evaluation _study_udf_en.pdf and http://www.cabernet.org.uk/index.asp?c=1124&n=56 [online] [01.08.2014.]

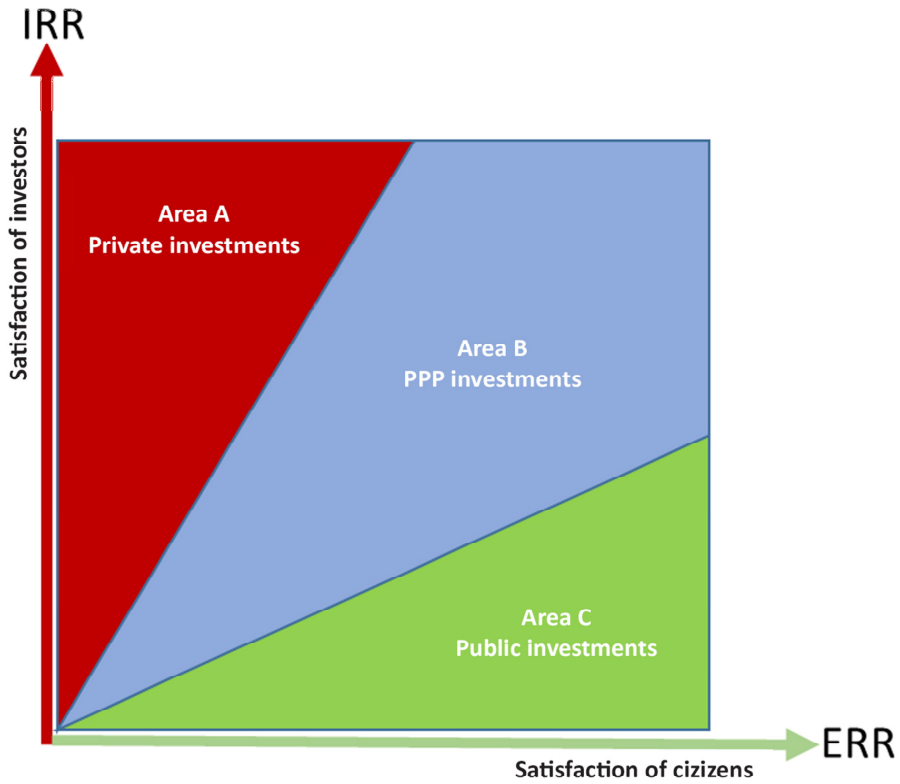


Figure 7 CABERNET classification of urban renewal projects
Source: Arhivanalitika, 2014

The "Blue Zone" indicates favourable application of EU financial instruments or the so-called B - investment refers mainly to those urban investments for which different forms of market imbalances exist and whose[17] origin may be the result of:

1. Foreign influence by third parties
2. The importance of preserving public goods and public interests
3. Asymmetry in access to key information
4. Conflict of interests of the parties involved
5. Unstable and capricious markets
6. Legislative and regulatory imperfections and / or omissions
7. Incomplete and / or unenforceable property rights
8. Social inequality and exclusion
9. Denial of fundamental human rights and freedoms

[17] European Commission (2014) Ex-ante assessment methodology for financial instruments in the 2014-2020 programming period – Volumes I to VI, [online] available at http://ec.europa.eu/regional_policy/thefunds/fin_inst/index_en.cfm [01.08.2014.]

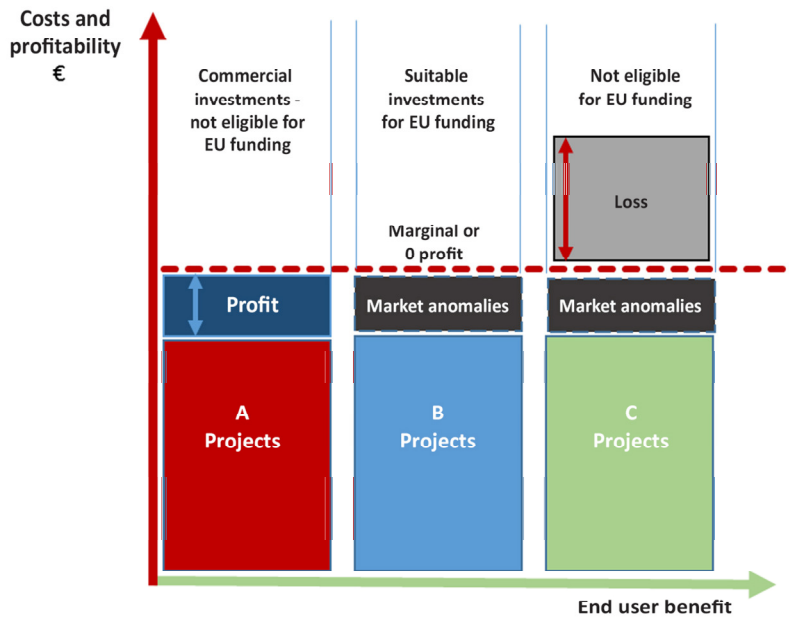


Figure 11 Project benefits assessment for EU FI according to CABERNET methodology
Source: Arhivanalitika, 2014

B-projects from the CABERNET classification have a low rate of internal return on equity (IRR) and would not be attractive to private investors as opposed to profitable project from the A category. The meaning of the JESSICA financial instrument is to correct that part of market imbalance, which is essential to private investors entered the project and finance it in its development and implementation, and thus achieved the leverage effect of public funding in relation to private. It is considered to be more effective and long-term sustainable model of financing public projects from the classic giving grants incentives solely from public budgetary resources and preferably in all situations where this is feasible and justified. Projects in category C are not suitable for financing from the Funds for urban development (or other FI EU) but potentially suitable for funding through a grant system of incentives.

In order for all projects of the B-category to become suitable for financing under the UDF must meet the criteria of achieving measurable social, economic and cultural effects that are in line with EU programme 2020 and the objectives of the national Operational Programmes and the objectives of the city plans for sustainable urban regeneration related. The criteria of social efficiency (Key Performance Indicators) can be:

- The number of jobs created and / or new companies
- Reduction of CO_2 emissions
- Amount of saved energy (in units of measurement and their money)
- The share of energy savings in the energy budget of the household
- Production of renewable energy (in MWh)
- The ratio of the private and public resources (FUD and / or projects)
- Surface recycled developed land
- Reducing the number of citizens suffering energy poverty in a particular zone / area, etc.

Since 2007, when the concept of JESSICA revolving fund was introduced, the nine member states established 18 holding funds and 43 funds for urban development on a national and regional level (Table 2). The total budget of JESSICA funds for urban development was in 2013 of 1.5 billion €. Through these funds projects ranging from revitalization of derelict industrial areas of the city to the restoration of large blocks were financed.

Table 2 Review of existing subordinated JESSICA funds for urban development in 9 EU countries - 18 holding and 43 regional funds for urban development

Country	JESSICA HF	Name of FUD	Year	Currency	Fund size in mil
Bulgaria					
	HF Bulgaria	Regional Urban Development Fund AD	2011	BGN	37
		Fund for Sustainable Urban Development of Sofia JSC	2014	BGN	24,6
Czech Republic					
	HF Moravia-Silesia	Contera Urban Development Fund MS s.r.o.	2012	CZK	170
		CMZRB - Českomoravská záruční a rozvojová banka, a .s.	2012	CZK	170
Greece					
	HF Greece	Pancretan Cooperative Bank and TT Hellenic Postbank	2011	EUR	15
		National Bank of Greece S.A.	2011	EUR	83
		Investment Bank of Greece	2011	EUR	49
		EFG Eurobank Ergasias S.A.	2012	EUR	67
		Piraeus Bank	2012	EUR	39
Italy					
	HF Campania	Iccrea BancaImpressa SPA	2012	EUR	31.9
		Banco di Napoli SPA	2012	EUR	63.8
	HF Sardinia	Fondo Sardegna Energia (Equiter)	2012	EUR	33.1
		Banco di Sardegna S.p.A.	2012	EUR	33.1
	HF Sicily	Fondo di Rigenerazione Urbana Sicilia SRL(Equiter)	2011	EUR	90
		ICCREA BancaImpresa	2012	EUR	53
Lithuania					
	HF Lithuania	Siauliu Bankas AB	2012	EUR	18
		Swedbank AB	2010	EUR	18
		Siauliu Bankas AB	2010	EUR	10
		SEB Bank	2010	EUR	6
		VIPA/CPMA	2013	EUR	20
		Siauliu Bankas AB	2013	EUR	40
Poland					
	HF Mazovia	Bank Gospodarstwa Krajowego	2012	PLN	154.7
	HF Pomerania	Bank Gospodarstwa Krajowego	2011	PLN	154
		Bank Ochrony Srodowiska S.A.	2011	PLN	66
	HF Silesia	Bank Ochrony Srodowiska S.A.	2011	PLN	243
	HF Westpomerania	Bank Ochrony Srodowiska S.A.	2011	PLN	63
		Bank Zachodni WBK SA	2010	PLN	77
	HF Wielkopolska	Bank Gospodarstwa Krajowego	2011	PLN	294
Portugal					
	HF Portugal	Banco BPI S.A.	2010	EUR	61
		Caixa Geral de Depositos S.A.	2011	EUR	49
		Turismo de Portugal IP	2011	EUR	15
Spain					
	HF Andalucía	AC JESSICA Andalucía, S.A.	2011	EUR	80.5
	HF FIDAE (ES)	Banco Bilbao Vizcaya Argentaria SA	2012	EUR	123.2
Great Britain					
	HF London	Foresight Environmental Fund LP	2011	GBP	35
		Amber Green LEEF LP	2011	GBP	10
		Amber Green LEEF 2 LLP	2011	GBP	40
		The Housing Finance Corporation Ltd (THFC)	2013	GBP	12
	HF Northwest England	North West Evergreen LP	2011	GBP	36.1
		Chrysalis LP	2012	GBP	32.6
	HF Scotland	Amber Green SPRUCE LP	2011	GBP	8
		Amber Green SPRUCE 2 LLP	2011	GBP	40

Source: Arhivanalitika, 2014

Another JESSICA revolving fund that focused on buildings renovation - Estonian KREDEX revolving fund is an interesting example for its modus operandi and the relative similarity to the problems of the ZagEE project.

Box 2 KREDEX – Estonian revolving fund for energy renovation of apartment buildings

Kredex[18] is the Estonian revolving fund established in 2001 by the Ministry of Economy and Communications, with the primary objective of financing energy efficiency, especially energy renovation of households in Estonia through loans, contribution to loan and bank guarantees. The Fund will provide the value of 72 million € which are secured by 80% from national sources and 20% from European Structural and Cohesion Funds (ERDF and ESI). It was developed with the help of the EBRD, and although the it was the first of its kind until today it is the most successful program. So far, with the support of the Fund, more than 18,000 apartments were renovated with an average energy savings of 36%.

Special KREDEX renovation loan was developed in cooperation with the Association of Tenants and co-ownership, associations and building managers. The main advantages of renovation loan in relation to the previously existing "green loans for citizens" (similar to those currently available in Croatia) were:

1. Uninsured dedicated credit for the EO properties - cash flow from energy savings has served as the most important collateral for loans, with the obligatory participation of beneficiaries in the amount of 15% of the investment.
2. The procedure for granting and administration of the loan was significantly simpler than the previously existing commercial "soft green loans".
3. The period of loan repayment was significantly longer in renovation loans - now 20 years, according to the previous 10 or 12 (also similar to the experience in Croatia).
4. Developed system of cascading grants incentives for more extensive interventions in the energy reconstruction of residential property under the principle of "Do More - Get More!"::
    a. For EE at least 20-30% of grants are provided in the amount of 15% of investments (as a personal participation which thereby became unnecessary)
    b. For EE of 40% grants have been provided in the amount of 25% of the investment (10% more than the personal participation)
    c. For EE of 60% grants have been provided in the amount of 35% of the investment (20% more than the personal participation)

15 years from the beginning of the preparation and setting KREDEX's gained very valuable experience:

a) Preparation of establishment and provision of financial resources lasted long (more than 2 years)
b) The programme was needed another 5 years to achieve mass participation and involvement of stakeholders what is expected in relation to the objectives of the project and that despite strong communication campaign
c) The project has proven to be very sensitive to sudden changes in the macroeconomic situation in the country that have taken place- in Estonia on several occasions since its introduction in 2001. The problems were primarily reflected in the collection and use habits of consumers in the household before, during and after the national economic crisis.
d) Due to the impact of economic cycles the project eventually developed additional mechanisms for protection of social transfers in the function of the fight against energy poverty and the consequences of changes in lifestyle and housing caused by aging, combined with economic difficulties.

The project is considered to be extremely successful and today his activities crossed the border of Estonia and spread to the Baltic network energy efficiency. One of the actual objectives of the Fund was the development of Estonian companies through energy renovation household sector, but also the financing of strong promotional and educational campaign, "*Energy saving as a way of thinking!*"

Diversified energy Urban development fund usually has a sectoral approach to the issue and is not focused solely on building renovation. It already includes all manifestations of final energy consumption, its production and distribution within urban areas.

[18] Lari Suu (2013) Presentation: Kredex – Financing housing in Estonia, Villnius, November 29th 2013. [online] available at http://www.hupfas.hr/Lauri-Suu-financing-housing-in-estonia.pdf [06.07.2014.]

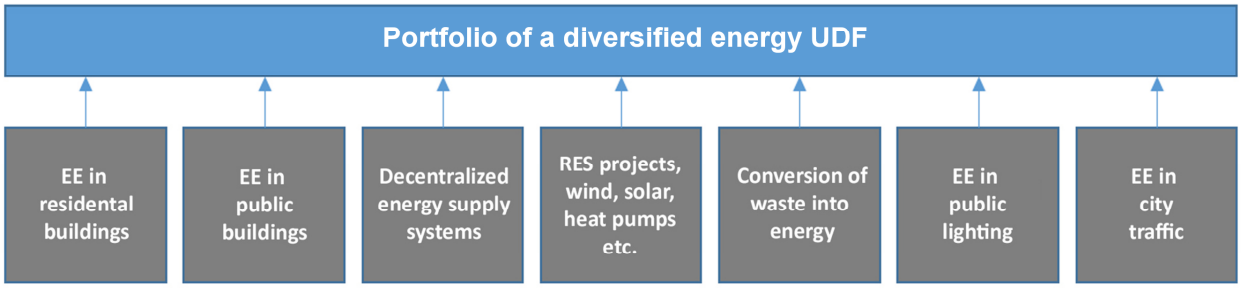
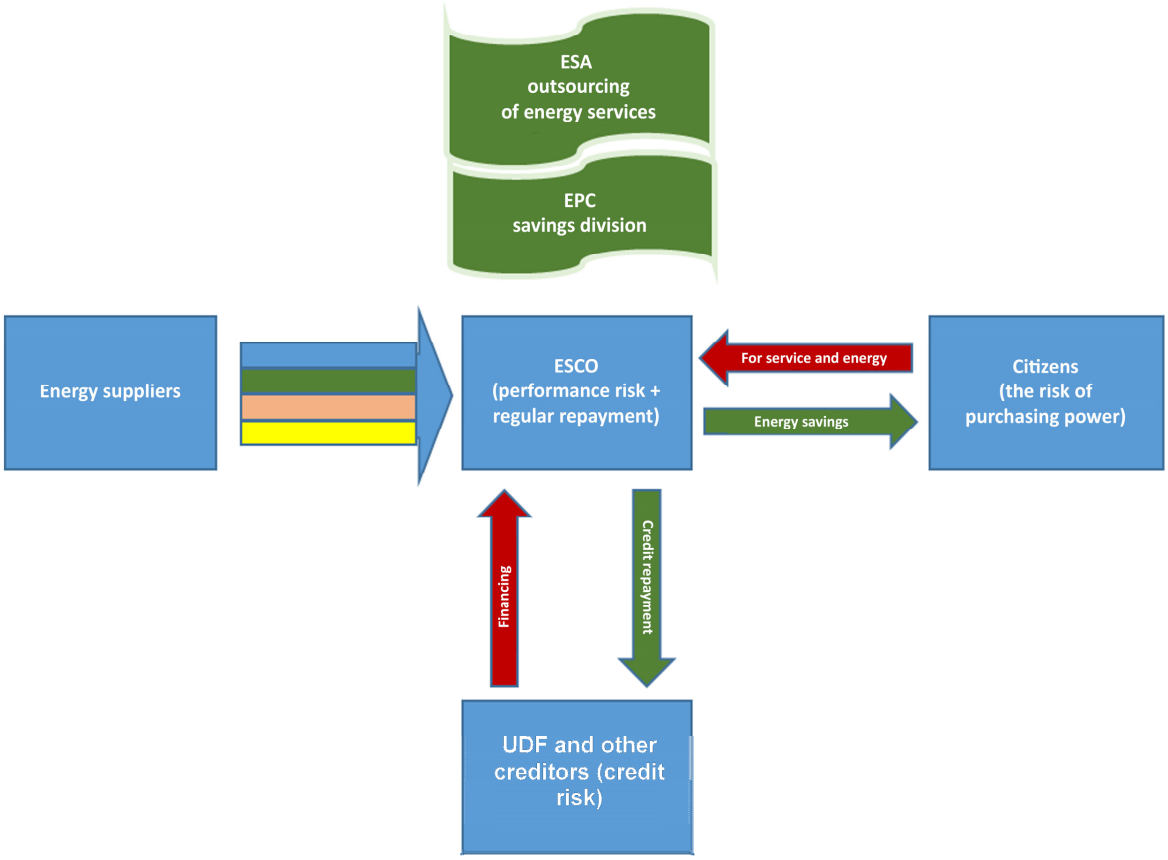


Figure 8 The scheme portfolio of a diversified energy UDF
Source: Arhivanalitika, 2014

Funds for urban development focused on EPC / ESCO projects in the city's public and private facilities are specialized for the development of this form of energy services market and often represent a "financial supermarket" for the needs of the market. They usually come in two basic forms in respect to the end users they are focused at - citizens or ESCOs.



Picture 9 UDF focused on the EP - loan model for ESCOs
Source: Arhivanalitika, 2014

There are examples of „non-JESSICA“[19] revolving funds for energy efficiency as well. The term refers to the revolving funds that have been established by non-EU institutions such as the World Bank, IFC, GEF, through direct PPP commercial financial institutions and EU

[19] World Bank Group (2014) Establishing and Operationalizing an Energy Efficiency Revolving Fund : Scaling Up Energy Efficiency in Buildings in the Western Balkans, May 2014., [online] available at http://www.worldbank.org/content/dam/Worldbank/Event/ECA/revolving.pdf, [01.08.2014.]

member states although their policies differs from the JESSICA fund policies and they usually combine several different financial EU instruments and program.

Examples of "non-JESSICA" specialized revolving UDFs:

- GIS Revolving Credit Guarantee Fund from Hungary which provides joint guarantees for renovation loans and was established by the World Bank and the IFC
- Bulgarian ESCO Fund (BEF) which provides a service of forfeiting for private ESCOs and indirectly guarantees for them. This fund was established through PPP by a private investment fund and the EBRD.

However, since these UDFs that are focused on energy renovations are established in countries which are members of the EU same general rules apply as for any other form of state aid and grant incentives and PPP which is valid on the territory of the EU. Some more "degrees of freedom" exist in relation to the procedures and time limits in the JESSICA financial EU instrument.

From the KREDEX experience and other examples of revolving funds models conclusions that are important for the future of energy renovation projects in the City of Zagreb can be drawn:

a. With regard to the long period of preparation and even longer period required to achieve the desired volume of urban revolving fund financed from EU funds, the decision to structure the financing mechanism for the financing of reconstruction projects in the City of Zagreb must be developed in several stages.
b. The financial resources required for implementation of Croatian JESSICA revolving fund can be allocated from the budget of the city / county or state, through a dedicated tax, using capital entities that could be established in the first stage of the project development (urban "super ESCO"), contribution to the loan of international financial institutions (World Bank, GEF, etc.), or as in the case of other J - initiatives by redirecting funds from the EU or from other sources.
c. The first step is the expression of interest to the European Commission and the development of evaluation studies for analysing the volume of funds required and the method of establishment of the fund in Croatia.
d. Model of cascade incentives ("Save more - you get more") in which the rate of incentives (subsidies, contribution to the loan) increases with the rate of savings should be from the beginning incorporated in the financial mechanism.
e. From the first stage of development of the project contracting and administration of financial instruments to end-users should be designed as simply as possible and with minimal transaction costs. The classic method of processing and administration of loan applications, as it is in the application in green loans, for citizens can inhibit the growth of the project volume and achievement of the objectives of reconstruction.

However, even if all the above conditions of the project success are met, it should be remembered that the "pure" revolving fund is not a final solution to the problem of funding energy renovation program (ZagEE and beyond) for the City of Zagreb. The estimated volume of complete urban revitalization exceeds the revolving facilities which are recorded in other similar countries (eg. The Estonian KREDEX) and which are conceivable in Croatian conditions.

3.2. White energy certificates trade

The basis for the introduction of the new mechanism is the European Commission's directive on energy efficiency and energy services (2006/32 / EC)[20]. The system of certification of energy savings with their customers has been introduced in five EU member states (Italy, France, United Kingdom, Denmark and Belgium). Schemes differ according to the degree of development of trading white certificates.

White certificate is a document by which a supplier of energy (heat, electricity) confirms that at its end-user are generated some energy savings. These certificates are usually part of a national programme which sets to energy suppliers the legal obligation to achieve the savings for end users.

A public body (a state agency) defines the energy objectives, acceptable list of measures and a list of authorized contractors to implement energy efficiency measures, and by verifying the savings issues marketable "white certificates".

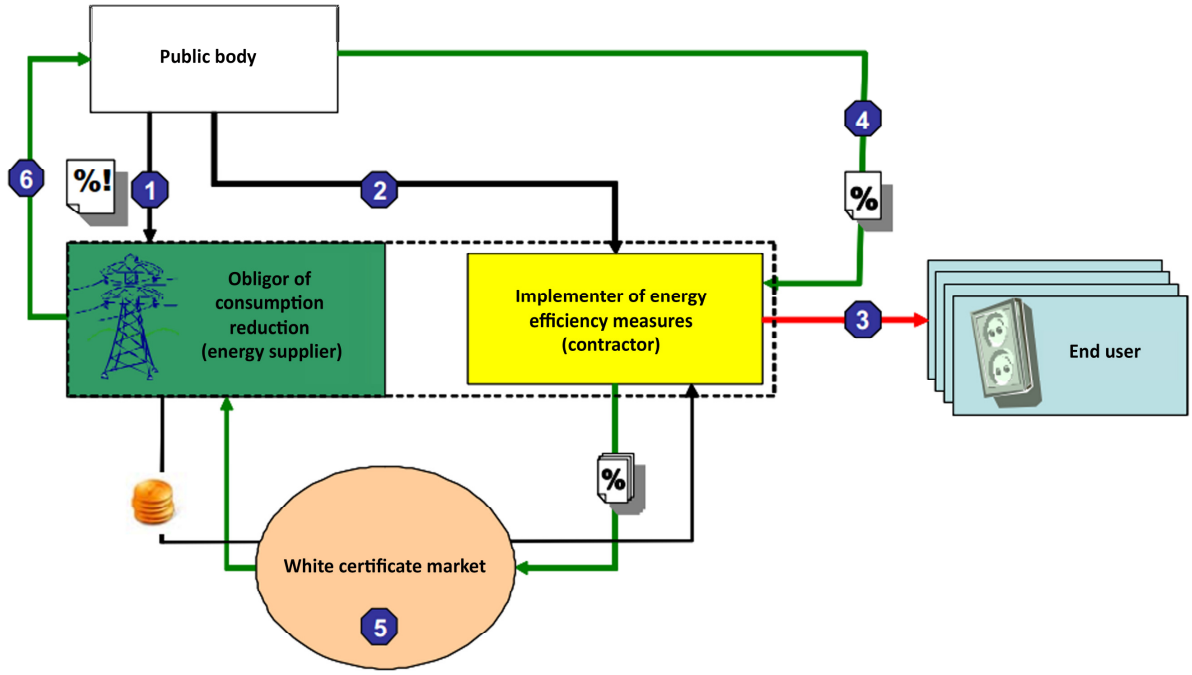


Figure 10 The standard chart of the model marketable white certificates
Source: BPIE, 2014

Energy suppliers can set the savings achieved through the implementation of measures or by purchasing certificates from other participants in the system, if that is more cost-effective. In the case that savings are not achieved, suppliers bear the financial sanctions.

[20] European Commission (2006) Directive 2006/32 / EC of the European Parliament and the Council of 5 April 2006 on energy efficiency of end-use and energy services and repealing Council Directive 93/76 / EEC (Text with EEA), [online] available at http://www.hep.hr/esco/dokumenti/eu200632EZ_hr.pdf [16.07.2014.]

As part of the international project RELEEL in whose implementation was involved the Ministry of Economy, in 2008 the obstacles for the introduction of white certificates in Croatia were identified. Back then, the biggest obstacles included a lack of market-formed energy prices, previous inexperience of public authorities in the implementation of complex regulations and low number of energy suppliers for the formation of high-quality market trading white certificates.

Croatia, meanwhile, has made several important changes:

1) Regulated and liberalized market of electricity supply
2) Regulated and liberalized market of heat supply
3) Regulated and liberalized market of liquid fuels
4) Made preparations for liberalization of the market of gas supply (expected in 2016)
5) Re-arranged and created a market for energy savings
6) Encouraged the development of ESCO companies with the introduction of new Programme of energy renovation of public buildings

Taking all facts from the above into consideration it can be concluded that the system of marketable white certificates for energy savings could be introduced in Croatia in the foreseeable time, but with necessary efforts frin infrastructure and legal apparatus. Room for introduction of this measure exists because 2 million HRK have been allocated for this purpose in the 3rd NEEAP.

Progress in this direction would have a big impact on the parameters of investments in an integrated energy renovation of buildings, both for cities and providers of energy services - ESCO companies. In particular, it would allow the successful use of models EPC Plus and EPC Green models as more liquid collateral for loans (both for ESCOs and cities).

3.3. Green securitized bonds

"Green securities" as the term for government and corporate securities for specific purposes (energy efficiency and / or renewable energy) are associated with debt financing arranged through the capital market. In the context of the ZagEE can be displayed by issuing green securities (eg, bonds) that can be used to collect part of the initial capital required for the direct funding of the project, which is lending urban reconstruction and energy renovation of city buildings. When the risk is controlled, and cash flows therefore relatively predictable, such a situation presents an opportunity for securitization. Securitization is the process of converting the expected cash flow in securities (bonds) whose issuance - the placing on the market of capital, collects new funds for further investment. Bonds (principal and interest) shall be paid from the funds of share cash flow as de facto insurance or surface bonds. The definition reveals that this is in fact a revolving instrument, because the expected flow of charge from the energy project can be used to attract new funds from investors in advance, before the cash flow from savings is realized, in order to finance new energy investments. In this way, the volume of funds for investment in this type of projects can grow up to achieve economically optimal amount of investment.

Green securitized bonds have three main benefits:

First, expected cash payment can be securitized, regardless of who the initiator of the original transaction is. What matters is that the initiator has a well-managed risks and relatively predictable cash flow. Thus, the initiators can be ESCOs, also specialized intermediaries such as funds for urban development and financial actors, such as leasing companies and factoring can be initiators. Moreover, if there are standard contracts (standardized basic documents and contracts are an important prerequisite of securitization), securitized can be "pool" of contracts and related cash flows with similar characteristics. The possibility of gathering financial contracts of a number of initiators doing one edition green bond provides great flexibility in the use of the instrument, which may prove desirable properties in terms of when energy investments financed through complex financial mechanisms include a large number of stakeholders.

Second, securitization of expected cash flows allows dividing tranches according to risk levels. The most common are three tranches which need to be understood as the three hierarchically ordered priorities in the collection. So the first order of bonds (senior tranche) de facto have no risk, bonds in second order (mezzanine tranche) has a marginal risk, while the third row of bonds (junior tranche, First loss piece) carries almost all the risk: namely, if there are any problems with the collection, the owners of these bonds are the first to be charged. Such "tranching" or segmentation of the expected cash flow risk allows the different financial intermediaries recognize his own preferred ratio of risk and return. For example, pension funds will generally buy tranches of first and second order, while the risks are more inclined to look for intermediaries tranche of the third row, which can be used as a basis for issuing guarantees (Credit enhancements).

The third advantage of issuing green bonds through securitization lies within the large volumes (it is estimated that individually created securitization bond is not worth if the value is less than 300 million €). This means that this instrument can fully remove restrictions on capital available to finance projects in the long term. Several editions of the multi-year period can provide literally billions of euros, to mobilize resources of pension funds and foreign investors, and it is especially important to be able to mobilize resources and favourable international development banks. Moreover, they all have the financial capacity and know-how in this kind of business and play the role of adviser and / or arranger and donate the cost of counselling and / or appear as holders of risky parts editions.

The mentioned third advantage of issuing green bonds in securitization processes at the same time reveals the biggest disadvantages of this instrument.

First, it cannot be structured in small volumes. Therefore, in the initial, developmental stages of the project this instrument cannot be used.

Second, financial contracts that define green bonds must be standardized and designed to facilitate their transfer to specialized entities that issue green bonds (Special Purpose Entities or SPV - Special Purpose Vehicle). Therefore, the issues of standardization and portability of the contract must take into account from the very beginning of the project, i.e. the conclusion of the first transaction, that is, long before the time when volumes reach proportions which will allow the first securitization.

Third, this kind of business requires a sophisticated and predictable financial regulation. The financial crisis in 2008 / 09 showed that securitization can be dangerous for investors when it takes place in an unregulated environment. A bill that would regulate this type of transaction in Croatia was made six years ago and no legal solution has ever been developed, mainly because of lack of understanding of the issue. And this is an illustration of the fact that the complexity of these types of transactions and the lack of knowledge is the main obstacle to their wider use.

4. Conclusion

Solutions for the City of Zagreb in the initial phase of the project ZagEE will have to rely on a combination of instruments which are known in our legal and financial environment, recognized at EU level, and which are suitable for structuring financial models that will seek support from EU funds. Such general recommendations exclude fiscal instruments from the get go. Although they should not be completely avoided, the fiscal situation in terms of deficit and public debt in Croatia is such that it excludes significant reliance on fiscal instruments. Undeveloped ESCO market and the high cost of capital are the reason for non-use of this model for the project and, indirectly, the failure of the National programme of energy renovation of public buildings.

As a final model of financing of the project the two optimal, although conservative options currently available on the Croatian market were selected:

- Grant funding from the Fund for Environmental Protection and Energy Efficiency in the amount of 40% of the total investment.
- The use of funds from the contribution to the loan from the Programme of the European Commission - Energy Efficiency Finance Facility and credit lines from the Programme for crediting of projects related to environmental protection, energy efficiency and renewable energy of the Croatian Bank for Reconstruction and Development in the remaining amount.

In conclusion, chosen solutions will be based on a combination of financial market instruments and public (grant) investments. This result suggests several facts: first, the need to combine a large number of instruments and incentives in the framework of the future financial mechanism, and secondly, the need to achieve maximum leverage or activating credit potential of private financial intermediaries, particularly credit institutions. Public funds (predominantly EU funds) should be seen as a kind of "capital" that will trigger financial leverage and ensure the involvement of private funding. However, from Croatian perspective, this can only be seen as a long term scenario as underdeveloped ESCO market and legal barriers prevent the uptake of innovative financing instruments for the ZagEE project.

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