REPORT OFANALYSED BEST-PRACTICES ABOUT ALTERNATIVE FINANCING MODELS OF EE AND RES MEASURES

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Version 1

Contents

Introduction on the implementation EE/RES measures considering different funds

Investment in energy efficiency and renewable energy sources is often costly. It involves high capital expenditures of thousands and millions of euro (depending on the investment type). High CAPEX often create a barrier for the municipalities to undertake the investment because of budgetary restrictions regarding investment spending, making external sources of funding very important for the success of the investment. Of course smaller investments are also possible but usually, they don't need additional financial support from other sources than municipalities own budget.

1.1. Investment types

In the context of this study we can define two types of investments:

1. Investment in energy efficiency measures.
2. Investment in renewable energy sources.

The first type often involves the implementation of small RES systems especially on the buildings (like PV, heat pumps, solar collectors etc.), so in the context of the second type we mean only individual investments in RES not connected to energy efficiency improvement of buildings.

Energy efficiency measures are related to buildings and are focused on complex thermal retrofitting of buildings including implementation of energy efficient equipment and lighting. In general, these investments are expensive and are characterised by low IRR and high SPBT values (except for lighting modernization which has a short payback time). However thermal retrofitting of buildings provide high energy savings and increases comfort for building users as well as better aesthetics. It is important to provide financial support for the municipalities, from other than budgetary sources, because municipalities often lack sufficient funds for energy efficiency investments in the building stock.

Most of the best practices provided by project partners focus on energy efficiency measures in buildings, including:

- included thermal insulation of external walls and roofs,
- replacement of windows and doors,
- roof modernization,
- modernization of heating systems (including fuel switch),
- installation of small RES sources supplying the building with energy,
- implementation of energy management & monitoring systems,
- modernization of internal and external lighting systems.

Renewable energy sources investments are usually small and medium scale installations utilising different types of natural energy (sun, wind, geothermal, biomass). In general, these investments are expensive - with high CAPEX but usually with shorter payback time (high IRR and low SPBT) especially when supported by national RES support programmes. The initial investment cost is usually a barrier for the municipalities, therefore, it is important to provide financial support for the municipalities, from other than budgetary sources.

In rural regions these investments are most often:

- wind turbines,

- biogas plants,
- PV plants
- small PV and solar collectors distributed installations (supplying houses).

1.2. Funding sources

Apart from municipal budget, there are other sources of external capital for carrying out investments in energy efficiency and renewable energy sources in rural regions of Central Europe.

Currently, the most important funding are EU funds, which provide different types of funding opportunities, such as grants, loans, guarantees, subsidies and prizes.

1. Grants - funding for projects contributing to EU policies. Grants are awarded to private and public organisations, and exceptionally to individuals. Grants are a form of complementary financing. The EU usually does not finance projects up to 100 %. In other words, the project will be co-financed by the beneficiary organisation. Grants are mainly awarded through calls for proposals.
2. Loans, guarantees and equity - as forms of assistance, in relation to EU policy and programmes). The financing goes through local financial institutions — banks, guarantee societies or equity investors — which determine the exact financing conditions: the amount, duration, interest rates and fees.
3. Subsidies and other types of funding - are managed directly by EU national governments, not by the European Commission.
4. Prizes - are rewards to winners of contests from Horizon 2020.

These funds are provided mainly through funds and funding programmes:

- European Regional Development Fund (ERDF) – regional and urban development,
- Cohesion Fund (CF) – economic convergence by less-developed regions,
- European Agricultural Fund for Rural Development (EAFRD),
- European Maritime and Fisheries Fund (EMFF),
- Horizon 2020 programme.

For the EE and RES investments, the most important source of EU funding is the ERDF and CF. Also, national governments provide funding for this types of investment through national programmes as well as regional funding programmes.

For the purpose of this study other than EU and national/regional funding options are called alternative models. They specifically include (but are not limited to) public participation model, ESCO, bank instruments, bonds, citizen participation and other.

In the second part of this report are described typical models of financing EE and RES investments identified on the basis of project partners input. Complete best practice examples provided by project partners are presented in the appendix.

1.3. Experiences from other Interreg projects

This report creates synergy with other Interreg founded projects, which also have identified some good practices regarding energy efficiency and RES funding in Europe:

- VIS NOVA - the project addressed both the supply (provision of sustainable energy) and demand site (efficient use). Best practices were researched, transferred and tested in pilot measures (both

pre-investment and small investment). During this process, financial resources from national programmes were explored.

- RENERGY - the specific objective was to develop an integrated framework for improving energy efficiency and the optimal utilisation of RES by offering an innovative model for creating sustainable energy efficient urban environments.
- CombinES - promoting the use of Energy Performance Contracting within subsidy programmes.

Findings of these projects have been presented in respective reports.

2. Best practices for financing models of RES and EE measures

2.1. UE and national funds

European and national funds are the most common financing tool for implementation of energy efficiency measures and renewable energy. In most cases, investments are financed with ERDF resources. There are also some examples of national funds dedicated to energy efficiency and renewable energy development.

2.1.1. The European Regional Development Fund (ERDF)

The ERDF covers all project partner countries in the form of regional/national programmes (depending on the country regional statistical division) and the European Territorial Cooperation (ETC). Under low-carbon economy the fund provides resources for energy efficiency and RES - the amount of available funds depends on the category of the region: more developed regions, transition regions and less developed regions. Also, the support intensity of the fund depends on the region category. In general, the ERDF provides up to 85% of the investment cost as a non-refundable grant.

The ERDF operated by each country/region follow the same EU rules and provides funding for infrastructural expenditures. The INTERREG focuses on regional cooperation with lower potential for infrastructural investment (just as a pilot investment) and it is managed by a Join Secretariat establishing rules for all participating countries. All project partners are covered by the Central Europe Interreg programme. Rules for ERDF and Interreg differ for the periods 2007-2013 and 2014-2020.

The following best practices which include ERDF funding were provided by partners:

Country	title	Period	Value (million EUR)	Financing details
Slovenia	Biofoture cross-border demonstration and training center for energy sustainability	2009-2012	1.27	• Operational Programme Slovenia-Hungary 2007-2013: 1,026,348.65 EUR
Slovenia	Reconstruction and non-energy extension of kindergarten at the elementary school Tišina - phase 2	2009-2012	1.26	• European Regional Development Fund "Development of Regions": 1,004,000 (79.9%) • State budget: 82,753 (6.6%) • Funds beneficiaries - Municipality of Tišina: 172,740 (13.7%)

Slovenia	Environment-friendly and energy-efficient Snovik Thermal Spa	2001-2012	5.14	• Terme SNOVIK have received 35 per cent (1.800.000 EUR, 2003) through the tender of the European Regional Development Fund, while 25 per cent was contributed by the state
Estonia	Renovation of multi-apartment buildings in Estonia	2010-2014		• KredEx, as public financing institution, was the holding fund manager of the renovation scheme, receiving €17.74 million of ERDF funds and attracting another €48.97 million from public sources for the same purpose. Two banks distributed the funds to apartment associations who could rely on KredEx for technical assistance as well as help with energy audit grants, or guarantees covering their 15% share of renovation costs.
Poland	Biogas plant with the capacity of 0,2 MW at the wastewater treatment plant in Siemiatycze	2013-2015	2.8	• The total value of the project came to approx. 12 M PLN (approx. 2.8 M EUR). Out of this amount, almost 7.5 M PLN (approx. 1.7 M EUR) was granted from the Regional Operational Programme for the Podlaskie Voivodeship for 2007-2013 and further 2.5 M PLN (approx. 0.6 M EUR) came from a loan from the Voivodeship Fund for Environmental Protection and Water Management in Białystok. • The project also foresaw the purchase of the installation for dehydration of the digested sludge, which cost approx. 2 M PLN (approx. 0.5 M EUR) and was also co-financed from the ROP (with the 85% co-financing rate).

2.1.2. The Cohesion Fund

For the 2014-2020 period, the Cohesion Fund concerns Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia, thus it's not available for all project partners. The Cohesion Fund can support projects related to energy as long as they clearly benefit the environment in terms of energy efficiency and use of renewable energy.

The fund is managed by national authorities according to common EU rules. In general, the CF provides up to 85% of the investment cost as non refundable grants. The fund is dedicated to large infrastructural investments.

The following best practices which include ERDF funding were provided by partners:

Country	title	Period	Value (million EUR)	Financing details
Slovenia	Energy renovation of educational institutions of the municipality of Puconci	2013-2015	1.47	• EU Cohesion Fund (870,984.04 EUR) • Slovenian participation (153,703.13 EUR) • Own share of the Municipality (444,320.32 EUR)
Hungary	Support for building energy development using renewable energy with combined credit products	2017-2019	283.75 (programme value)	• Non-refundable subsidies and loans are available with at least 10% own financial resource in a simplified procedure, one-stop-shop system. The simultaneous use of non-refundable subsidy and the loan is compulsory. In addition to non-refundable subsidies, this structure offers loans with much more favourable conditions than the market. The project to be implemented consists of non-refundable subsidies, loans and contributions, which together define the total cost. • The amount of non-refundable subsidy is minimum 3 million HUF, max. 50 million HUF. Amount of loan: min. 3 million HUF, max. 50 million HUF. The amount of non-refundable subsidy can be up to 45% of the total eligible cost.
Czech Republic	Energy Savings in the Agricultural and Forestry school Frýdek - Místek	2010-2011	0.76	• the EU funds 9,423,513 CZK, • the state budget (The Ministry of the Environment) CZK 554,324 • the Moravian-Silesian region CZK 9,777,555

2.1.3. National funds

Some countries create national funds which aim at energy efficiency improvement and RES development providing grants and preferential loans for investments. Example of such funds are:

- Eco Fund, Slovenian Environmental Public Fund - financial assistance is offered mainly through soft loans from revolving funds and since the year 2008 through grants; this is a general purpose environmental fund providing funding also for energy efficiency;
- Polish National Fund for Environmental Protection and Water Management (NFEP&WM) - providing grants and loans under different financing programmes; this is a general purpose environmental fund providing funding also for energy efficiency;

- Hungarian 'Otthon Melege' (Warmth of Home) Programme - specifically designed programme for energy efficiency improvement in buildings.

The following best practices which include ERDF funding were provided by partners:

Country	title	Period	Value (million EUR)	Financing details
Slovenia	Project »BISTRA HIŠA - SMART HOUSE« - Renovation and refit works of a historical building with geotermic - installation of Heat pump	2005-2008	0.59	• a loan of 500,000 EUR from the EKO Fund of theRepublic of Slovenia (loan - 85%, own financing - 15%).
Hungary	Energy efficiency support with combined financing tools (and with building society savings) - The Warm of house Program	2015		• 50% state aid • loan repaid by savings (LTP)
Poland	Thermal retrofitting of The National Library in Warsaw	2012-2015	6.18	• The total cost of the modernisation works came to approx. 26.6 M PLN (approx. 6.18 M EUR). Co-financing from the NFEP&WM reached 20.7 M PLN (approx. 4.81 EUR). Nearly 4 M PLN (approx. 0.9 M EUR) was covered from the budget of the Ministry of Culture and National Heritage and the remaining amount was covered from the National Library's own funds

2.2. Regional programmes

Regional financing mechanisms include international funds focused on selected regions as well as funds specifically available in sub-national regions.

2.2.1. EEA Grants - Norway Grants

This financial mechanism is available for new member states together with Greece and Portugal. One of the priority sectors is Environment, Energy, Climate Change and Low Carbon Economy under which energy efficiency and RES investments can be financed. A maximum of 150 EUR grant per tonne CO_2 equivalent per year reduced/avoided is foreseen.

The following best practices which include ERDF funding were provided by partners:

Country	Title	Period	Value (million EUR)	Financing details
Slovenia	Energetically Economical Kindergarten Manka Golarja in Gornja Radgona	2008-2009	4.23	• Total project cost: 3,556,400 EUR (from the municipal budget), • Grant amount from the Norwegian Financial Mechanism: 672,466 EUR

2.3. Other alternative models of financing

In this context, alternative financing means types of funding other than EU, national and regional funds. It also combines different funding sources (including EU and national) for the implementation of the project - in many cases, a third-party financing is included.

2.3.1. Public-Private Partnerships (PPP)

The PPP focuses mainly on energy efficiency through the Energy Performance Contracts (EPC), under which an Energy Services Company (ESCO) invests in a comprehensive refurbishment (building insulation and renovation of the heating systems) and repays itself through the generated savings. This is the most common case. To lower risk of the investment in many cases, EU funding may be included in the PPP project.

In case of RES investments, the formula of PPP can also be used through the involvement of private investor covering most or part of the investment capital - in such case the private investor is repaid by the profits from the energy generation (in proportional share to the capital engagement). Such an example has been provided by one project partner.

The following best practices which include ERDF funding were provided by partners:

Country	Title	Period	Value (million EUR)	Financing details
Poland	Comprehensive thermal retrofitting of public facilities in the Municipality of Karczew	2013	2.68	• The value of the contract signed between the municipality of Karczew and the contractor company (ESCO) - amounted to 11 518 756 PLN (approx. 2 678 800 EUR). • To cover part of the costs the municipality received co-financing from the National Fund for Environmental Protection and Water Management, granted within the Green Investment Scheme (GIS) and coming to 1 323 621 PLN (approx. 307 800 EUR). • Capital repayment to the contractor will be done over a 14 -year period.

Poland	Complex thermal retrofitting of educational buildings in Zgierz	2017-2018	12.26	• The project is implemented in the model of "Design-Build-Finish-Operate". In this model, the project is implemented based on a PPP contract, which includes design, construction, financing and operation of investments. Unlike the other models, in this case, capital expenditures, which are refundable from EU funds, are borne by the private partner. • Total value of the project: 52 730 774,67 PLN (ca. 12,262,970 EUR); Co-financing (84,58 %): 35 260 265,04 zł (ca. 8,200,061 EUR); PPP agreement: 56 411 000,00 zł (ca. 13,118,837 EUR); other costs (management, supervision etc.) are covered from the municipal budget. • The project is a hybrid project co-financed by the European Union from the European Regional Development Fund under the Integrated Territorial Investment Facility of the Regional Operational Program of the Lodz Region for the years 2014-2020.
Slovenia	Full energy renovation of the public objects in the municipality of Postojna on the model of energy contracting	2016-2018	1.90	• Funds of the Municipality of Postojna: 280,785.44 EUR • EU and RS public resources (MIZ) - Cohesion EU Fund: 686,100,00 EUR • Private partner: 1,004,324.23 EUR
Germany	Construction and operation of a wind turbine within the Energy Concept for Energy Autonomy until 2050 in Zschadraß, Saxonia	2009	3.2	• Since the establishment of a municipal utility for the 3300-inhabitant community is not economical for personal and financial reasons, the municipality has outsourced the energy production in a civic association and a foundation. • The green electricity is fed into the German electricity grid and remunerated by the Renewable Energy Sources Act. The investment is around 3.2 million euros. The municipality carries about 20 per cent of the investment through a civic association and a foundation. • The remaining investment is taken over by a private operator from the village. • The municipality has to use the proceeds from the wind turbine to pay off the

				loans. But after about 15 years, the municipality will have paid off the loan and generate revenue from the wind turbine.

2.3.2. The European Energy Efficiency Fund (eeef)

The eeef provides a Technical Assistance facility by way of consultant services. The TA beneficiaries can use the consultant services to carry out, for example, feasibility studies, energy audits and evaluate the economic viability of their investments. Are public entities in EU are eligible for funding of energy efficiency, small-scale renewable energy projects. The investment following technical assistance phase has to be financed through the eeef mechanisms (by loans, bonds or ESCO services).

The following best practices which include ERDF funding were provided by partners:

Country	Title	Period	Value (million EUR)	Financing details
Netherlands	Street lighting upgrade of the City of Venlo	2012-2016	8.5	• technical assistance provided by eeef TA, • investment financed through the senior debt mechanism of eeef.
Germany	Building retrofit for the University of Applied Sciences - Munich	2012-2013	1.1	• technical assistance provided by eeef TA, • energy performance contract (EPC) for both of the buildings on the university's campus in Munich-Pasing, with a total EPC volume of €1.1 million • In this financing scheme, University acts like employer and hires Johnsons Control to implement EE and RES measures acc. to their energy performance contract and pays Johnson Control receivables/energy savings per annum which they have guaranteed the university for a contract period. • Johnson Control and EEEF closed forfaiting agreement (purchase of 70% of energy savings). Johnson Control according to an agreement then forwards sold part of energy savings to EEEF.

2.3.3. Other models

Apart from PPP and eeef funding, there are also other non-conventional sources of capital needed for the investment in RES or energy efficiency - especially through financial mechanisms. An exemplary best

practice (an innovative public participation model) for this kind of financing has been provided by Aufbauwerk Region Leipzig GmbH - ABW.

There is also another interesting example of funding - the use of exchange rate differences from funding contract for carrying out additional investments like in Niepołomice.

The following best practices which include ERDF funding were provided by partners:

Country	Title	Period	Value (million EUR)	Financing details
Austria	Helmut - street lighting with civic participation within the Project Climate and Energy Model Region Klostertal	2013	0.1	• € 100,000 was provided by the population within ten days. • Every individual could by so-called "Lichtscheine" (Light Tickets). One "Lichtschein" cost € 1.000, which was enough to modernize two street lamp heads. The legal basis was hire purchase. • The purchaser received a refund of € 140 per year for the purchase of a license for 8 years, which equates to an effective interest rate of 3.25% and 3 LED lamps (value € 30) for home use. • In addition, the purchase was cancellable at any time for a handling fee of € 80. The balance was paid in full.
Poland	Installation of RES systems in public utility buildings and private households in Niepołomice	20212-2017	19.23	• The total value of the project implemented in 6 municipalities amounted to 82 704 876 PLN (22 275 030 CHF = approx. 19 233 690 EUR). 64.51% of the cost (53 352 915 PLN = 14 369 621 CHF = approx. 12 407 654 EUR) was covered from Swiss funds and remaining 35.49% (29 351 961 PLN =7 905 409 CHF = approx. 6 826 036 EUR) from municipalities' and other beneficiaries' own contributions. Citizens had to cover 30% of the costs of their individual installations, while 5.49% was provided from respective municipalities budgets. In the case of RES systems installed on public utility buildings, 100% of own contribution came from municipalities budgets. • As a result of currency exchange rate increase (from 2.9 PLN/CHF to 3.7 PLN/CHF) the municipalities had a larger amount of funds available (in PLN) that it was foreseen in the initial phase of the

				project. Additional funds had been used for thermal retrofitting of public buildings following annexe to the agreement with the funding institution.

3. Summary – recommendations for PPs based on comments all PP to presented BP

Most of the best practices provided by project partners concern energy efficiency improvement in buildings as it is the most common investment undertaken by the municipalities. In this context main funding source used were the EU funds (ERDF and CF), however increasingly popular are investments involving third-party financing (PPP).

EU funding - the most popular funding source for EE and RES investments - especially through grants which are dedicated to projects with low profitability (with low SPBT, not profitable in terms of financial analysis criteria). EU funding provides a high share of investment capital (up to 85%) needed for the success of the municipal initiatives. However, this type of funding (grants) is becoming less common in the EU with more funds coming in revolving funds offering loans on better than market conditions. It is important for the municipalities to be prepared for a smaller share of grants and a larger amount of loan type financing through EU revolving funds.

This tendency leads to an increased share of PPP based projects which include both EU and private financing allowing for de-risking of the investment (lower risk means lower cost for the municipality). It is foreseen that this type of investment, especially in the energy efficiency measures (in the form of ESCO) will be predominant in the next programming period of the EU (2021-2027) therefore it is important for the municipalities to become familiar with this type of project-based financing following available best practices in this field.

National and regional funds are specific to countries and regions and in general financing schemes resemble those of the EU funds. In many cases these funds may be used as a source for additional funding for the project, covering parts of the owners share of the investments financed through EU funds or in the form of PPP. Presented best practices provide examples of such complementary funding.

There is a need for the development of other alternative funding schemes/sources apart from PPP and EU funds. This is vital for the municipalities as the main source of funding stream from the EU will be drying out in coming years. This report presents some examples of such funding including public participation as well as exchange rates differences.

In terms of replication, the municipalities have to look especially at good examples of PPP projects involving EU and private funds. The public participation model of street lighting modernization in Austria is a valuable source of inspiration for other municipalities.

Regarding the RES investment currently, there are available support schemes for the development of RES (like feed-in tariffs, subsidies, certificates of origin etc.) in many countries which provide additional income for the operators of RES sources at the operational phase making the investment more profitable. However, the CAPEX for this kind of investment is still a barrier for small municipalities. To overcome this EU funding or private capital may be introduced - this study presents both types of investments. Due to phasing out of RES support schemes in coming years in the EU this type of support (PPP) should become of main interest for the municipalities.

It is recommended for the municipalities to include experiences and recommendations from other Interreg funded projects which also investigated financial aspects of EE and RES investment: VIS NOVA, RENERGY and CombinES.