



**Cost Efficient Options and Financing Mechanisms  
for nearly Zero Energy Renovation  
of existing Buildings Stock**

## **DELIVERABLE 3.7**

***Financing mechanisms suitable for each  
Municipality***

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## Abbreviations and Acronyms

Acronym	Definition
EEFIG	Energy Efficiency Financial Institutions Group
IEA	International Energy Agency
Soft loan	A soft loan is a loan with an interest rate below the commercial rate and/or a longer repayment period.
Tax abatement	A tax relief associated with fiscal support, resulting in foregone income to the government
OECD	Organisation for Economic Cooperation and Development
GIB	Green Investment Bank (UK)
EEEF	European Energy Efficiency Fund

## CERTUS PROJECT IN BRIEF

Southern European countries are undergoing a severe economic crisis. This hinders the compliance to the latest Energy Efficiency Directive, demanding strict energy efficiency measures for the public sector. Investments required to renovate public buildings and achieve nearly zero energy consumption have long payback times. Many of the municipal buildings in Southern Europe require deep renovations to become nZEB and this should not be regarded as a threat but rather as an opportunity for the energy service and the financing sector.

The objective of the proposed action is to help stakeholders gain confidence in such investments and initiate the growth of this energy service sector.

Municipalities, energy service companies and financing entities in Italy, Greece, Spain and Portugal are involved in this project. The plan is to produce representative deep renovation projects that will act as models for replication. Twelve buildings in four municipalities in each country were selected. The partners will adapt existing energy service models and procedures and will work out financing schemes suitable for the 12 projects. Consequently, the partners will create materials, such as guides and maxi brochures, suitable to support an intensive communication plan.

The plan includes four workshops with B2B sessions targeted to municipalities, ESCOs and financing entities. These actions shall be complemented by four training activities targeting municipal employees and the participation in international events targeting all three stakeholders. We expect that our action will have a significant impact by triggering investments in renovations to achieve nZEB and the uptake of the ESCO market in Southern European member states.

# 1. OBJECTIVES OF THE DELIVERABLE

The scope of this deliverable D3.7 titled “Report on financing mechanisms suitable for each Municipality” of the CERTuS project is to identify, analyze and classify existing financing opportunities for energy efficiency retrofits in public buildings, with a special focus on those available in the four South European Countries participating in Project (Italy, Greece, Portugal, Spain), facing challenging economic situation.

The main objectives of the delivery are the followings:

- Mapping the financial instruments for EE (energy efficiency) projects, with a focus on the four CERTuS’ countries, considering pros and cons and their characteristics
- Analyze best practices for financing in different countries
- Understand how these instruments could reduce the Cost of Capital for the financiers
- Analyze if there are some financial instruments most adaptable to nZEB projects
- Analyze if there are some financial instruments that can be selected as the optimal solutions for CERTuS projects
- Identify differences among the four countries involved in CERTuS project
- Give some considerations and recommendations concerning solutions for financing the deep energy retrofitting of existing building in order to become nZEB

The mapping of the existing financing schemes was carried out at different levels, considering for Supranational Financial institutions (e.g. EIB, EBRD, etc.), Structural Funds, National & Regional tools, Grant and/or Foundations and No-profit bodies. Research has also revealed less known financing tools such as social crowdfunding, equipment leasing.

In order to identify, analyse and classify the existing financing schemes for energy efficiency projects in public buildings with a special focus on those available in the 4 South Countries, different information channels and levels were used:

- In-depth analysis also through the study of the some European papers
- Best market practices
- Direct Partners experience in the field and dialogue with CERTuS partners
- Web research on this topic

nZEB are innovative initiatives, in particular for Public Authorities, with peculiar complexities, also on the financial side. In particular, they could gain from matching different financial sources and financial instruments depending on:

- Project features;
- Municipalities needs;
- Resources available for the Municipality;
- Financial incentives in place in the specific country;

In the following paragraphs, specific financial sources and financial instruments are described, detailing main characteristics. These financial sources could be activated in different project phases, for instance: Research, Development, project structuring and planning (e.g. ELENA Fund, Horizon 2020, etc.)

- Building phase (e.g. grant financing, subsidized funds, traditional banking loans, etc.)
- Management phase (e.g. fiscal incentives, etc.)

The choice of the most adequate financial mix is a consequence of the knowledge of project and financing characteristics.

## 2. OVERVIEW AND METHODOLOGY

### 2.1. OVERVIEW

Financing energy efficiency initiatives in public building, and in particular nZEB initiatives, is a complex and challenging activity. The market for energy efficiency of building in fact is characterized by:

- **Fragmented and peculiar initiatives**
  - each project shows its own peculiar features (difficult to standardize)
  - buildings are usually located in different areas and they have several uses

**Performance risk**, in fact energy savings can be quantified only ex post

- **Non standardized EPC** (Energy Performing Contracts) because energy performance (and underlying financial cash flows) are related to the specific building and standard security packages do not cover all risk areas
- **Different counterparts**: building users can be private citizens, Public Authorities, Companies, etc.

**Different counterpart risk**, in particular in some circumstances the risk the building owner will not be able pay back the fee is real.

It is also important to underline that the selection of the financial sources is just a step of the whole analysis and it depends on the renovation options choice. The steps are synthetized below:

- i. Recognition of the state of the buildings (e.g. propriety, localization, dimension, etc.);
- ii. Collection and organization of electricity and fuels consumption data;
- iii. Analysis of “as is” power-management mode of the building (internal temperatures, hours of building use, number of users, ...)
- iv. Analysis of further building characteristics (e.g. contractual status, opportunities, constraints, etc.);
- v. Maintenance contracts – if existing - analysis ;
- vi. Structuring of the renovation option that the Municipality aim to realize;
- vii. Risk analysis and mitigation measures;
- viii. Financing sources available for the intervention and identification of the available and potential funds;
- ix. Analysis of the most suitable public procedure to realize the intervention;
- x. Stakeholder’s involvement, to better understand the demands and needs of the territory
- xi. Based on procedures, available funds, and energy efficiency needs: analysis of the viable and sustainable technical solution that could be realized.

nZEB interventions represent a challenge with respect to traditional and innovative energy savings technologies. The financial system, although many dedicated tools were implemented, it turns out to be still in a testing phase.

As reported in previous experiences of the project Partners, the typical energy savings threshold coherent with market conditions is around 30%-40%. This is due to the non-linear relationship between investment and savings.

Investments for further energy savings can be financed with specific ad-hoc financial instruments or public grants. Typically, to make a nZEB financially viable, several mechanisms must be activated:

- **Fund matching** between different financing sources (i.e. market, subsidized resources and grant) trying to reduce the **grant contribution** to the minimum needed level;
- **Increase the project length**, where it is possible;
- **Increase the investment size summing up several Local Authorities**, in order to reduce the overall portfolio counterpart rating;
- **Increase the investment size summing up several buildings**, in order to reduce (on average) the incidence of structuring costs;

**Make in-depth considerations** on the renovation options solutions and select the most efficient energy efficiency options, where it is possible.

Based on the aforementioned considerations it is important that the European Union and its Member States continue in supporting the development of nZEB initiatives that represent both a need for governments to comply with EU legislation and an important resource for the EU economy.

In recent years several initiatives to reduce energy consumption in buildings were implemented, with a tendency to operate on a vast scale (e.g. support measures in Italy for the energy efficiency of schools funded by Elena Program), with more standardized Energy Performance Contract and a tendency to develop energy efficiency specific financial instruments. The new challenge is to develop nZEB energy efficiency measures and find the right financial support such that even the nZEB market could become more mature.

**As reported in previous Project's reports, energy efficiency projects are usually made up by a mix of interventions with different financial sustainability levels** (see delivery D.2.5. "Twelve economic evaluation reports" for more clarifications and information):

- a. Interventions **"market attractive"** (e.g. heating system change, district heating systems, lighting management, etc.) may be financed by banks and private equity investors (e.g. ESCOs);
- b. Interventions **"partially market attractive"** (e.g. solar and photovoltaic, windows and coats regeneration, etc.) may be financed by "hybrid instruments" such as public equity funds, soft lending, subsidized guarantees, etc.
- c. Interventions with **"No market attractiveness"** (e.g. structural interventions) can be financed only through grants.

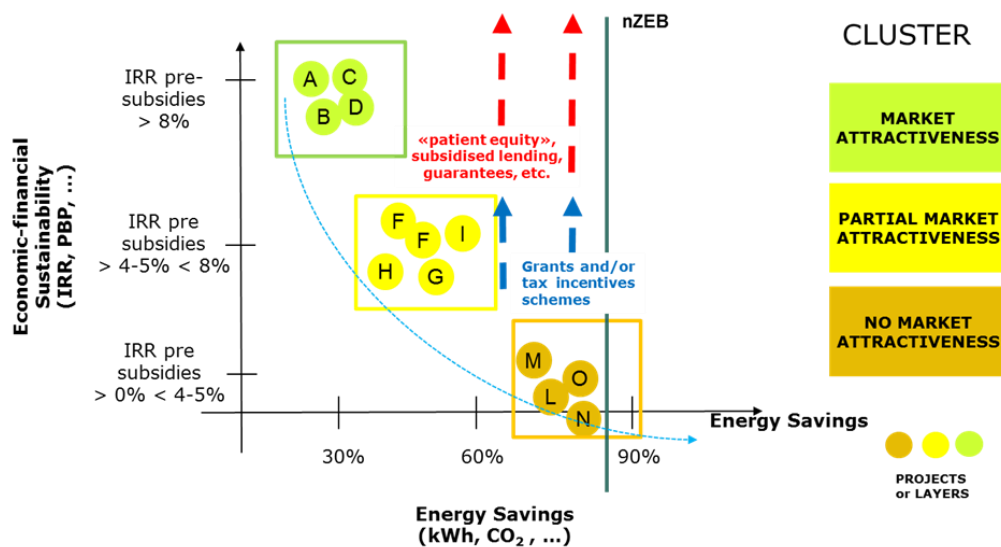


FIGURE 1. SUSTAINABILITY VS NZEB ENERGY SAVING

Energy efficiency sector is featured by market failure problems, because the market would finance only a part of the “socially desirable interventions”.

However, non-financially viable interventions can have **social and environmental benefits** compensating costs and therefore “allowing” a public intervention.

In this context, the previous deliveries showed that nZEB projects often rank as the initiatives with layers that have different levels of economic sustainability.

A **fund matching strategy** should balance public and private investments, in order to cover all financial needs, avoiding the market crowding out. Therefore, depending on projects typologies, procedures, final recipients, expected returns, etc. different sources should be activated, as reported below.

## 2.2. METHODOLOGY

The aim of this paragraph is to illustrate a simplified methodology that a Municipality could adopt to choose a mix of proper financial instruments. Please note that the following analysis does not consider constraints and regulation concerning the eligibility of projects for financing but it only shows various financial instruments dedicated to energy efficiency projects.

From a strategic point of view, in order to optimize the allocation of Public resources and to maximize the number of feasible projects, Municipalities may/should consider the following logic steps:

- Identify the need for infrastructure, starting from an analysis of the existing demand and offer (definition of a planning of infrastructures);
- Define a ranking of priorities of the social needs;
- Identify available financial sources for new investments, in terms of cash available owned by the Municipality or coming from transfers and borrowing capability;

- Separate “non financially viable” initiatives and those which may be financed totally/partially by private capitals;
- Allocate resources to the different projects on the basis of their financial needs;

The practical application of this process requires a careful analysis not only of the strategic priority of infrastructures, but also of the correct estimation of the financial need for the investment and/or for the management of the project and thus of the public finance available.

Usually Local Authorities provide finance to investments in the following ways:

- 1) Using resources transferred from other Public Entities (mainly the EU and the State);
- 2) Using resources coming from a surplus of current revenues on current costs;
- 3) Borrowing money from the debt market in the different ways allowed;
- 4) Activating private investments through public-private partnership mechanisms
- 5) With a combination of the above

The choice depends on a series of factors such as, firstly, the availability of resources, the conditions in terms of duration, interest rates, etc. and the consequent check of constraints the Authority undergoes to concerning the possibility of using resources, the project’s features and its compliance to the strategic choices of the Authority.

A brief scheme of this methodology as follows:

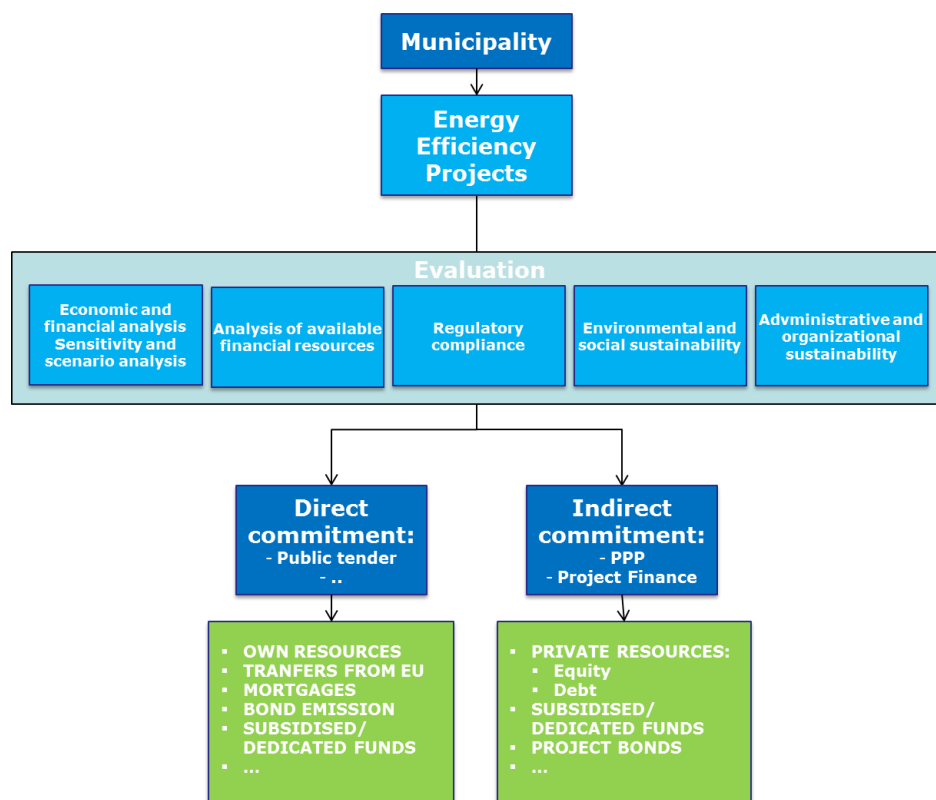


FIGURE 2. SCHEME OF THE SIMPLIFIED METHODOLOGY



This said, it is possible to describe a methodology for the choice of the different financial sources:

a. Economic and financial evaluation of the projects that the Municipality means to realize. This evaluation aims at:

- Fully represent the economic and financial trend of the project during its whole lifecycle;
- Analyzing and evaluating the sustainability of the project and its sensitivity to the alteration of some variables or in different scenarios;
- Defining the financial needs of the operation;
- Evaluating the sustainability of the projects from an investor/lender point of view (market test);
- Making provision of an appropriate monitoring and controlling tool for the project.

In particular, the analysis will give as output:

- i. An overall framework of investments and financial needs;
  - ii. Dynamics (flows) of revenues and costs of the project;
  - iii. Dynamics of project and capital cash flows (in this case without distinguishing between public and private investment)
- b. Once identified the financial needs for the realization of the investments, the Municipality should evaluate:
- 1) If it's possible to fully finance the projects activating the private market through public-private partnership mechanisms without investing own resources;
  - 2) If it's possible to partly finance the projects activating the private market through public-private partnership mechanisms combining a mix of financial resource, own or third party;
  - 3) If it plans to directly finance the project:
    - With own resources;
    - With resourced transferred from other subjects;
    - Emitting bonds;
    - Borrowing money from Banks or other financial institutions.

In particular, the Municipality should consider that the drivers of the choice between traditional procurement and PPP could/should not only depend on economic and financial factors, but also on compliance with the regulation of public contracts. While choosing the procedure to follow the Municipality should also consider constraints and prescriptions coming from National and European regulation (e.g. EU Directive 23/2014). Thus, the Municipality should not only evaluate the convenience of a project on its economic and financial sustainability but also from a social-economic point of view developing a cost-benefits and value-for-money analysis in order to check the transfer of the risk onto the private subject. These aspects are not part of the deepening of this document.

Focusing mainly on economic and financial aspects we show, as an example, a series of logic steps/questions that a Municipality may follow to choose the optimal financing structure of the project:

- 1) Is the project attractive for the market?
- 2) Is the project bankable?
- 3) Are project and capital returns consistent with the market?

- 4) How can I improve the market attractiveness for the market?
- 5) Are risks transferred from the Public Subject to the Private Subjects according to the ways of realization and management chosen?

The first three questions, **as indicated in delivery D.2.5.**, may be part of the so-called **“Market Test”**. This test could result into the following two opposite situations:

- a. **“The project is fully sustainable at market conditions”**: in this case, the Municipality, once done the appropriate tests and evaluations, may recur and should privilege forms of **public-private partnerships** in which the private subject takes charge of the realization of the project and of the finding of financial resources in the form of equity or debt (that the private subject will get from banks)
- b. **“The project is not sustainable at market conditions”**: in this case, the Municipality should check if and how many resources it bears and then the following situations may occur:
  - i. **Municipality’s own resources are sufficient to cover the whole amount needed for the investment.** The Municipality may evaluate the direct finance of the project through a public tender (traditional procurement)
  - ii. **Municipality’s own resources can only cover a part of the amount needed for the investment.** In this case, the Municipality should check for the availability of specific financial sources on the market to support the sustainability of the project. Otherwise, the Municipality should find a way to provide finance to the project on its own.
- c. Besides these two cases, there may also be some intermediate situation that were titled **“partially sustainable at market conditions”**:
  - i. In this case, as first step, the Municipality should check the availability of specific financial sources to support the sustainability of the project (e.g. subsidized or dedicated funds)
  - ii. There may be the possibility to improve the sustainability of the project through in-kind contributions;
  - iii. If specific financial sources are not available and other kinds of contributions are not possible, the Municipality may think about reviewing the whole project.

A simple table reporting the abovementioned steps as follows:

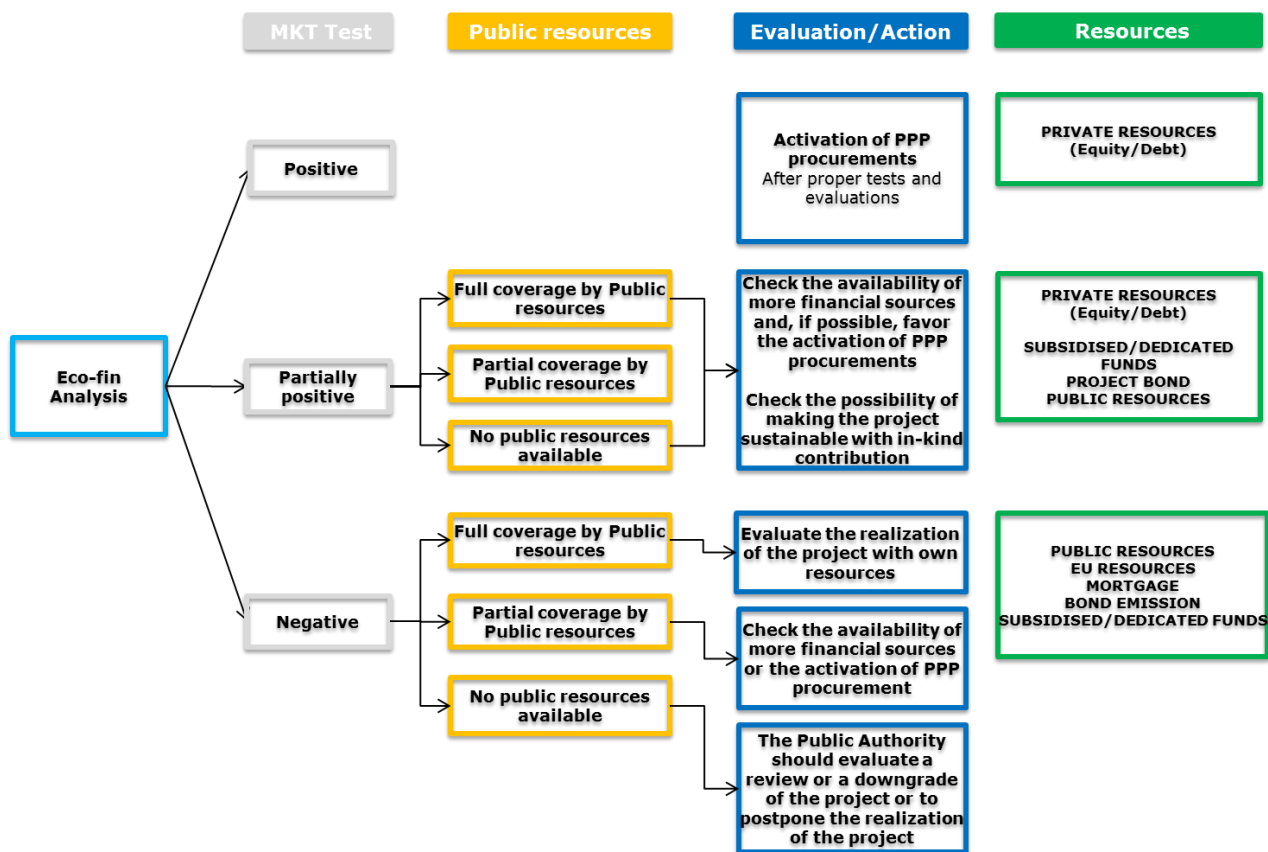


FIGURE 3. SCHEME OF THE ABOVEMENTIONED STEPS

In order to check the availability of the resources it is possible to think about the following relevant questions:

- 1) Who are the subjects that manage the resources? What are the ways to contact it?
- 2) What are the procedures to ask for the activation of a specific resources? Is the procedure simple or not? It is necessary to ask for a technical assistance?
- 3) When the project will be realized? Is the instrument or resource available during the project's development period?
- 4) Who are the beneficiaries? Could they guarantee a payment for the intervention and its benefit – energy savings?
- 5) What are the main features of the project in order to ask for its candidature?
- 6) What are the eligible investments? And what are the percentage to finance?
- 7) What are the documents to produce in order to ask for the instrument/resources?
- 8) What are the rules for the use and the project's reporting? Are they compliant with internal rules for procedures, budgeting and reports?

### 3. FINANCIAL OPPORTUNITIES

#### 3.1. SUMMARY

FINANCING OPPORTUNITIES	DESCRIPTION	EXAMPLES	TARGET PROJECT	
			Sustainability LOW - MEDIUM - HIGH	Complexity LOW - MEDIUM - HIGH
<b>EQUITY FINANCING</b>  <i>"Typically at market condition"</i>	Availability third-party financial resources (ie. ESCo or other interested developers/investors)	Investment funds Equity Crowdfunding Venture Capital and Private Equity FTT - ESCo	HIGH	MEDIUM - LOW
<b>LOANS AND GUARANTEES</b>  <i>"Typically at market condition"</i>	Specialized and sectorial Funds to finance technical assistance and development	EEEF Project Bond, Municipal Bond, ...	MEDIUM - HIGH	MEDIUM
	Financial institution products	Senior Loan Working capital Facility VAT Facility Leasing Guarantess		
<b>SUBSIDES and DEDICATED FUNDS</b>  <i>"Typically they give funds "Under market condition"</i>	Subsidies Guarantees, Subsidies Loans and/or Equity to finance project development	ESIF - Financial Instrument (ex JESSICA) PF4EE BEI funds on lending, ...	MEDIUM	MEDIUM
<b>GRANT FUNDS</b>  <i>"non-repayable funds- require some level of compliance and reporting"</i>	EU grants to finance R&D, strategic planning, pilot initiatives	ELENA H2020 ESIF (technical assistance axis) JASPER INTERREG (2014 - 2020) IEE III LIFE+ Programme, CEF, ...	LOW	HIGH
	EU grants to finance project development	ESIF (ERDF, ESF, Cohesion Fund, EARD, EMFT) National and Regional grant funds, ...		
		Crowfundig (donation based or reward based)		
<b>FISCAL AND OTHER INCENTIVES</b>  <i>"ad hoc measures"</i>	In order to support action and measures  Their effect the management project phases	Feed in tariffs Tax incentives White certificates On Bill repayment mechanism	Not relevant	Not relevant

## 3.2. EQUITY

### 3.2.1. GENERAL DESCRIPTION

Equity can't be easily described as a financing tool or product as it may have many different forms and scope. Equity is required for the implementation of any investment. So, for example equity can be provided from a public authority or a private fund and the scope of the fund could be the investment in energy efficiency construction projects or in general to real estate or other sector projects. Considering the energy efficiency sector, the expectations of any potential equity investor for implementing a deep energy renovation in public buildings are given to the table below.

Origin	Scope	Potential expectations
Public fund	Improvement of energy efficiency	Achieve 3% of building stock renovated each year (for EU)
	Renovation to nZEB	All new or renovated buildings should be nZEB
Single investor	The building's renovation, that could include a deep energy retrofiting	To increase the value of the building and increase its market attractiveness
Private fund	The investment to real estate, that could include a deep energy retrofiting	To increase the value of the building and increase its market attractiveness

TABLE 1. POTENTIAL EXPECTATIONS OF DIFFERENT KIND OF FUNDS

### 3.2.2. BRIEF DESCRIPTION OF MAIN FORMS OF EQUITY

Equity can be provided to a project through a managing authority - company, which could raise the money either from big investors or from a very big number of small investors. In the first case, usually there is a minimum amount of money that investors can contribute to the fund that the authority – company is managed. Also, big investors could be private or public. In the second case, there is usually a maximum amount of money that the investors can contribute and are individuals.

The main financing schemes that could provide equity for buildings' energy efficiency are:

- Real estate and infrastructure funds
- Energy efficiency investment funds
- Crowd funding

#### 3.2.2.1 REAL ESTATE AND INFRASTRUCTURE FUNDS

*“Real Estate and Infrastructure funds provide a large amount of energy efficiency investment in the building sector. This investment takes place during a fund's investment life cycle and they are part of conventional real estate investments”<sup>1</sup>.* -Real estate investment funds are assumed as key stakeholders to scale up finance in energy efficiency in buildings, both through increased equity investments and through increased fund activity in energy efficiency- as long as it is required by the national legislation or even better, the market itself.

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<sup>1</sup> “Energy Efficiency – the first fuel for the EU Economy: How to drive new finance for energy efficiency investments”, page 98, Energy Efficiency Financial Institution Group (EEFIG)

According to a recent study<sup>2</sup> of the Energy Efficiency Financial Institution Group (EEFIG), it has been “noted the emergence of new dedicated Sustainable Real Estate Funds whose strict application of socially responsible investment criteria and potential focus on best-in class energy performance buildings can support market transformation.” But according to the same study, their size tends to be small and they tend to focus on new buildings.

On the other hand, real estate companies seem to have an increased interest for buildings with relatively better sustainability credentials, as they tend to enjoy increased market value to both tenants and investors<sup>3</sup>. According to a study of Deloitte Center for Financial Services analysis regarding the retrofitting of existing office buildings with sustainable measures, including energy and water efficiency and waste reduction, reveals a higher internal rate of return (IRR) of the investment of approximately 155 basis points (bps) on average, on the overall building investment<sup>4</sup>.

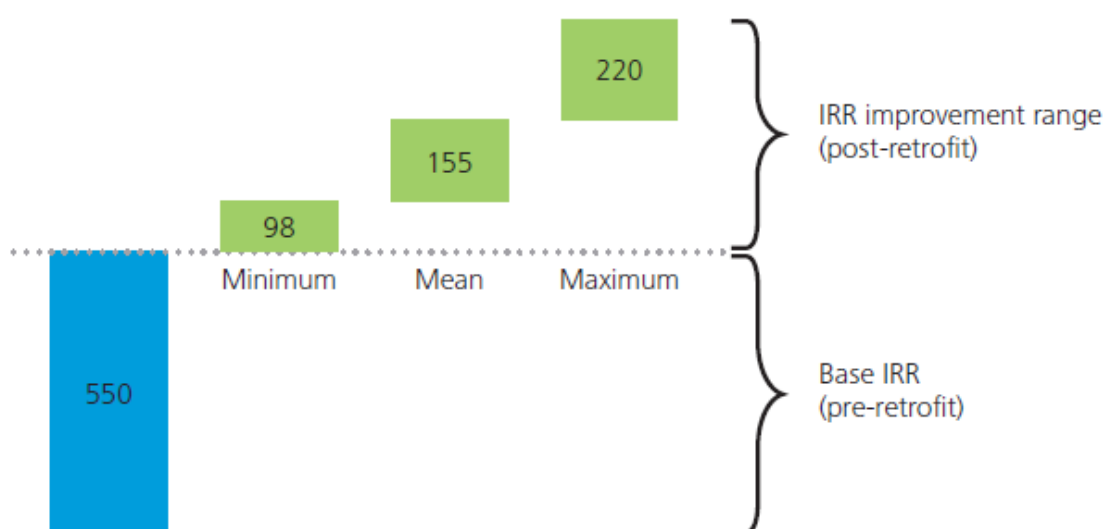


FIGURE 4. IRR IMPROVEMENT POST-RETROFIT IN BASIS POINTS  
(SIMULATION RESULTS FROM AN ANALYSIS PERFORMED FROM DELOITTE CENTER FOR FINANCIAL SERVICES)

Finally, over of 70% of real estate fund managers are integrating environmental management systems into their portfolio management and these investors lead the drive to reflect energy performance in the valuation of commercial buildings<sup>4</sup>.

### 3.2.2.2 ENERGY EFFICIENCY INVESTMENT FUNDS

Energy efficiency investment funds have as main scope the investment in energy efficiency projects targeting both buildings and industry, seeking a return based, at least partly, on savings achieved. According to EEFIG' report, such funds target Socially Responsible Investment (SRI) investors and public financial institutions for their own fund-raising<sup>4</sup>. Some energy efficiency investment funds have partnered

<sup>2</sup> <https://ec.europa.eu/energy/en/news/new-report-boosting-finance-energy-efficiency-investments-buildings-industry-and-smes>

<sup>3</sup> “2015 Commercial Real Estate Outlook Enhance Technology, Enable Innovation”, Deloitte.

<sup>4</sup> “Breakthrough for sustainability in commercial real estate”, Deloitte

with governments as investor, promoter or guarantor. These funds usually target to potential improvements of productivity and asset values.

Such funds, they may have expectations of high return and usually they fill comfort with projects having short or medium payback periods. Therefore, even Energy efficiency investment funds are not excluded for investing to the deep energy retrofitting of municipalities' buildings; it seems that it will be difficult to be at least the main investor body.

Following, are given some of the most known public and private Energy Efficiency Investment Funds in Europe that could operate as equity investors:

- **European Energy Efficiency Fund** (<http://www.eeef.eu/>)  
The European Energy Efficiency Fund (EEEF) is an innovative public-private partnership dedicated to mitigating climate change through energy efficiency measures and the use of renewable energy in the member states of the European Union. It focuses on financing energy efficiency, small-scale renewable energy, and clean urban transport projects (at market rates) targeting municipal, local and regional authorities and public and private entities acting on behalf of those authorities.
- **Fondo Italiano per l'Efficienza Energetica** (<http://www.fitef.com/>)  
Fondo Italiano per l'Efficienza Energetica (FIEE) is first Italian equity fund devoted entirely to investment projects in energy efficiency projects in partnership with ESCOs. FIFE is aiming to setup a diversified portfolio of small-sized (€1–5 million) and medium-sized (€5–20 million) projects benefiting private and public Clients. The investment scopes of the projects are focused to: “a) revamping of street lighting and privately-held lighting infrastructure, b) high-efficiency co-generation and tri-generation power plants fuelled by gas, biogas, syngas, biomass, c) high-efficiency district heating and cooling systems, including those fueled by renewable energy sources and d) energy efficiency projects in manufacturing processes.” FIEE aims to raise €150 million to be invested in the domestic market, for which it has already collected the commitment of the European Investment Bank to invest 25 million euro, while by the 4<sup>th</sup> of August 2016 (first closing) it managed to raise approximately €86 million.  
FIFE is aiming to projects with a target IRR of 10-12%, even with limited use of leverage and dividend yield to investors of 8-10%.
- **UK Energy Efficiency Investments Fund** ([www.sdcl-ee.com](http://www.sdcl-ee.com))  
The UK Energy Efficiency Investments Fund, managed by SDCL, is focused exclusively on energy efficiency project finance in the UK. The Fund was launched in 2012 and close on 31st July 2014, when EIB and three new limited partners joined the partnership through a co-investment agreement. This brought the total commitment to more than GBP104m<sup>5</sup>.
- **London Green Fund** (<https://www.london.gov.uk/about-us/mayor-london/london-green-fund>)  
**The London Energy Efficiency Fund** (<http://www.leef.co.uk/>)  
The London Energy Efficiency Fund (LEEF) has GBP100m from the European Regional Development Fund and London Green Fund to be lent to public or private sector borrowers on projects that promote energy efficiency. The appropriate investment size is between GBP1m and GBP20m.
- **Global Energy Efficiency and Renewable Energy Fund** (<http://geeref.com/>)  
GEEREF is an innovative Fund-of-Funds, investing in specialist renewable energy and energy efficiency private equity funds developing small and medium-sized projects in emerging markets. Therefore, South European Member States are not in the target region of GEEREF.
- **Sustainable Development Capital Limited** (<http://www.ggf.lu>)

<sup>5</sup> [http://www.eib.org/products/lending/equity\\_funds/infrastructure\\_equity\\_funds/uk-energy-efficiency-investments-fund-lp.htm](http://www.eib.org/products/lending/equity_funds/infrastructure_equity_funds/uk-energy-efficiency-investments-fund-lp.htm)

The Green for Growth Fund Southeast Europe (GGF) is the first specialised fund to advance energy efficiency (EE) and renewable energy (RE) in South-Eastern Europe and Eastern Neighbourhood regions. The activities of GGF are supported by a Technical Assistance Facility. South European Member States are not in the target region of GGF.

▪ **Sustainable Development Capital LLP** (<http://www.sdcl-ib.com>)

SDCL's investment business is focused exclusively on energy efficiency project finance. SDCL has established specialist funds in the UK, Ireland and Singapore and is launching new funds in New York and China. The funds invest in energy efficiency retrofit projects and seek a return based on savings achieved. This generates ongoing operational cost savings and carbon emission reductions as well as improvements to productivity and asset values, in compliance with current and prospective building regulations.

SDCL's funds are in partnership with governments as an investor, promoter or guarantor.

▪ **SUSI partners** (<http://www.susi-partners.ch>)

The funds currently managed by SUSI Partners' energy efficiency team is focused on the identification and implementation of Energy Efficiency projects related to industrial processes, building infrastructure and public infrastructure. SUSI partners has expertise and experience in the structuring and implementation of "energy performance contracting".

Country/Region	Fund / Manager	Beneficiary	Budget	Investment size	Maturity	Suitability for nZeb
<b>MS of the European Union</b>	European Energy Efficiency Fund	All building owners		€5m to €25m	up to 15 years	Medium
<b>Italy</b>	Fondo Italiano per l'Efficienza Energetica (FIEE)	Privately-held lighting infrastructure. High-efficiency co-generation and tri-generation power plants fuelled by gas, biogas, syngas, biomass. High-efficiency district heating and cooling systems, including those fueled by renewable energy sources.	€86 million (August 2016) <sup>6</sup>	€1m to €20m	6 years	Low
<b>UK</b>	UK Energy Efficiency Investments Fund	All building owners	GBP104 million			Medium
<b>London area</b>	London Green Fund	All building owners	GBP104 million	GBP1m to GBP20m		Medium

<sup>6</sup> <http://www.fitef.com/fondo-italiano-lefficienza-energetica-fiee-first-closing-at-e86m/#more-728>



Country/Region	Fund / Manager	Beneficiary	Budget	Investment size	Maturity	Suitability for nZeb
<b>Emerging markets</b>	Global Energy Efficiency and Renewable Energy Fund	Project developers and SMEs <sup>7</sup>	€222 million	up to €10m	up to 10 <sup>8</sup> years	Low
<b>South-Eastern Europe and Eastern Neighborhood regions<sup>9</sup></b>	Sustainable Development Capital Limited	Public buildings				Low
<b>Ireland</b>	Sustainable Development Capital LLP	Public buildings	€70 million			Low
<b>USA</b>		All building owners	\$100 million			Low
<b>Europe</b>	SUSI partners	Building infrastructure by using the energy performance contracting model <sup>10</sup>	€250 million <sup>11</sup>			Medium

**TABLE 2. MAIN ENERGY EFFICIENCY INVESTMENT FUNDS AND THEIR CHARACTERISTICS**

### 3.2.2.3 CROWD FUNDING

Crowdfunding is the practice of funding a project by raising contributions from a large number of people<sup>12</sup>. It is a form of alternative finance, which has emerged outside of the traditional financial system.

The crowd funding model<sup>13</sup> is based on three types of actors: the project developer who proposes the idea or project to be funded; individuals who support the idea; and “the platform” that brings the parties together to launch the idea.

In 2013, the crowd funding industry raised over \$6.1 billion worldwide, reached \$16.2 billion in 2014 and doubled once again in 2015 on its way to raising \$34.4 billion.

#### Types

1. Rewards Crowdfunding: entrepreneurs pre-sell a product or service to launch a business concept without incurring debt or sacrifice equity / shares
2. Equity Crowdfunding: the supporters receive shares of a company, usually in early stages, in exchange for the money pledged

<sup>7</sup> [http://ec.europa.eu/environment/archives/jrec/pdf/com\\_2006\\_583\\_en.pdf](http://ec.europa.eu/environment/archives/jrec/pdf/com_2006_583_en.pdf)

<sup>8</sup> <http://geeref.com/assets/documents/GEEREF%20Impact%20Methodology%20June%202016.pdf>

<sup>9</sup> <http://www.ggf.lu/about-green-for-growth-fund/energy-for-southeast-europe/>

<sup>10</sup> <http://www.susi-partners.ch/en/projects.html>

<sup>11</sup> <http://www.susi-partners.ch/en/news/details/article/sustainable-sarl-and-poevry-sign-memorandum-of-understanding-to-cooperate-in-energy-efficiency-proj.html>

<sup>12</sup> [http://cdn2.hubspot.net/hub/343005/file-2612198431-pdf/2015-Whitepaper\\_files-Retail/PENSCO\\_2015CrowdfundingReport\\_0315.pdf](http://cdn2.hubspot.net/hub/343005/file-2612198431-pdf/2015-Whitepaper_files-Retail/PENSCO_2015CrowdfundingReport_0315.pdf)

<sup>13</sup> [https://en.wikipedia.org/wiki/Equity\\_crowdfunding](https://en.wikipedia.org/wiki/Equity_crowdfunding)

3. Investment Crowdfunding: investors are given the chance to earn back a conventional fixed interest rate
4. Charitable projects: participants pledge a participation to support a local initiative or charitable project with non-monetary payoffs

Rewards-based crowd funding has been used for a wide range of purposes, including music and films promotion, free software development, inventions development, scientific research and civic projects.

### **Crowd funding and real estate projects**

The most commonly used types are equity and investment crowd funding. In both cases, the crowdfunding company is doing the due diligence and evaluation of the building projects, while each company may have specific investment criteria. For example some companies are focused to investments in specific geographic area, in residential buildings or those with a minimum acceptable financial performance. Crowdfunding companies also require a minimum investment, that it could be as low as €10, even usually it is greater of €1.000.

As long as the projects satisfy the predefined investment criteria of the platform, then it starts running the financing call (launch of crowdfunding), either in public or for platform's members. Investors' contributions (equity and investment crowdfunding) are secured by a registered first legal charge against the property or land.

The crowdfunding company is charging the borrower a fee once off, usually 5% over the collected money and the investor an annual fee, until the exit of the investment, for managing the project.

Crowd funding for real estate projects is not a widespread financing techniques in the four South European Member States participating in the project. It should be noticed that the most real estate projects, financed with crowd funding have been recorded in Italy and following in Spain. In Portugal and Greece it has not been recorded any real estate project. Especially in Greece, it has been note down only one platform, which has been officially launched in February 2016 and up to now (July 2016) works only with the donation model (charitable type)<sup>14</sup>.

The following table contains crowdfunding companies that offer real estate investments, mainly in Europe. The list is not exclusive but it could be assumed that is offers a good overview of the market and the main characteristics of the companies and the projects.

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<sup>14</sup> <https://www.nbg.gr/act4greece/act4greece-2/>

Country / Region	Crowd funding scheme	Comments
USA	<a href="#">Citizinvestor</a>	Citizinvestor is a crowdfunding and civic engagement platform for local government projects. Any government entity or their official partners can post projects to Citizinvestor.com. Citizens, can donate tax-deductibly to the projects of their choice.
UK	<a href="#">Crowdcube</a>	Crowdcube enables anyone to invest alongside professional investors in start-up, early stage and growth businesses through equity and debt investment options.
USA	<a href="#">Equitynet</a>	Equitynet is designed and refers to any entrepreneur, business owner, or manager in any stage or type of private businesses (from pre-revenue start-ups to \$100M/yr in revenue). It is focused to USA and non USA investors.
France	<a href="#">Anaxago</a>	Anaxago is focused to real estate investments with minimum contribution of as much as €1,000.
Netherlands	<a href="#">Bouwandeel</a>	Bouwandeel is focused to residential real estate investments in Netherlands.
UK	<a href="#">Byoot Capital</a>	Byoot Capital is an investment firm which focuses on real estate investments in UK, through crowdfunding financing <sup>15</sup> .
Germany	<a href="#">Companisto</a>	Companisto has been used for financing different kind of Projects, including real estate investments.
USA and Europe	<a href="#">CoOwning</a>	CoOwning is an international crowdfunding platform for real estate, growing internationally with properties in the US and Europe. CoOwning is located in Sweden and USA. Up to now (Aug 2016) they have founded project in <b>Spain</b> , Sweden and USA.
UK	<a href="#">Crowd2Let</a>	Crowd2Let has successfully sourced more than 750 real estate investments, worth in excess of £40M.
UK	<a href="#">CrowdAHouse</a>	CrowdAHouse has been launched in 2012 as an equity fund for investors in UK property. The average returns for investors are 5-10%.
UK	<a href="#">CrowdLords</a>	CrowdLords is an equity based crowdfunding platform for founding UK residential properties, launched in 2014.

<sup>15</sup> <http://timesrealtynews.com/real-estate-crowdfunding-platform-byoot-capital/>

Country / Region	Crowd funding scheme	Comments
UK	<a href="#">CrowdProperty</a>	<p><i>"Crowd Property is a peer-to-peer lending platform designed to facilitate loans between private individuals and professional property businesses. The loan is secured by a registered first legal charge against the property"</i><sup>16</sup>.</p> <p>Lenders is expected to receive on average "between 9% and 11% per annum gross return on the money they lend. The platform charges an arrangement fee, between 3% and 5%, for its services direct from the borrower once the project succeeds in reaching its funding target"<sup>17</sup>.</p>
Italy	<a href="#">Eppela</a>	<p>Eppela is an Italian crowdfunding platform for financing projects of various categories, including real estate projects. For example, in August 2016 it was active a crowd-funding campaign for the retrofitting of San Paolo a Ripa D'Arno Cathedral in Pisa, Italy<sup>18</sup>.</p>
France	<a href="#">Fundimmo</a>	<p>Fundimmo is an equity based crowdfunding platform for founding residential properties located in France.</p> <p>The minimum contribution (ticket) is €500 or €1,000, depending on the project. The maximum investment size is €1 million, the maximum amount allowed in France to be financed through crowdfunding<sup>19</sup>.</p>
France	<a href="#">Lymo.fr</a>	<p>Lymo is an investment firm which focuses on real estate investments in France, through crowdfunding financing.</p> <p>The minimum contribution (ticket) for lenders is €1,000.</p>

<sup>16</sup> <https://www.crowdproperty.com/>

<sup>17</sup> <http://timesrealtynews.com/real-estate-crowdfunding-platform-crowdproperty/>

<sup>18</sup> <https://www.eppela.com/en/projects/9161-support-san-paolo>

<sup>19</sup> <https://fundimmo.com/introduction#invest>

Country / Region	Crowd funding scheme	Comments
UK	<a href="#">Mayfair&amp;Morgan</a>	<p>Mayfair&amp;Morgan is a real estate crowdfunding platform launched in 2010, that maintain offices in UK and Dubai<sup>20</sup>. According to Mayfair&amp;Morgan, it offers mostly properties, most of which are already tenanted, to reduce elements of risk for investors. Its investment strategy offers investors equity participation with anticipated returns of between 13% to 16% per year<sup>21</sup>.</p> <p>The minimum contribution (ticket) for investing in real estate projects is £1,000. Investors are able to put their money into portfolios made up of 5 properties. Unlike other crowdfunding platforms, properties have been already bought by Mayfair&amp;Morgan that is finding tenants and is managing and maintaining the properties. As soon as each portfolio is fully funded, investors effectively own a share of all the properties in a portfolio, which spreads any risk<sup>22</sup>.</p> <p>Additionally, Mayfair&amp;Morgan offers investors the opportunity to acquire Property Backed Bonds with 6% yield.</p>
UK	<a href="#">PropertyCrowd</a>	<p>PropertyCrowd is a real estate crowdfunding platform (launched officially in November 2013) focused to city centre real estate, which is expected to be rent, offering a high yield. PropertyCrowd manage the investment on behalf of PropertyCrowd members – investors, who keep the 100% of the net rental income.</p> <p>For each investment - property is defined an exit plan, which is typically scheduled in 4-5 years after purchasing.</p>
UK	<a href="#">PropertyMoose</a>	<p>Crowd-funding platform is focused to real estate investments, providing investors the opportunity to earn monthly rental income and benefit from the potential increase of asset value, as long as it will be sold.</p>

<sup>20</sup> <http://www.crowdfundinsider.com/2014/10/52667-mayfair-morgan-launch-europes-first-international-real-estate-crowdfunding-platform/>

<sup>21</sup> <http://www.mayfairandmorgan.com/about-us/>

<sup>22</sup> <http://www.mayfairandmorgan.com/category/news/>

Country / Region	Crowd funding scheme	Comments
UK	<a href="#">Propnology</a>	<p>Propnology is a real estate crowd funding platform offering investment opportunities mainly related to UK residential buildings' projects. According to the website, the annual net yield of the investments already financed until now, is higher than 4%.</p> <p>is self defined as a peer-to-peer lending platform for small and medium-sized house builders and is focused in London, UK residential buildings development projects. According to Real-Funds the expected net return for investors is 7%.</p> <p>Generally, the minimum investment is £500 per project, although it is not fixed and it could be higher for specific projects. There is no maximum investment limit.</p>
UK	<a href="#">Property Partner</a>	<p>Property-Partner is a real estate crowd funding platform offering investment opportunities in UK residential property sector. Property-Partner is differentiate from other crowd funding platform, as it aspires to be a stock exchange for residential property that allows investors to diversify their portfolio and therefore manage their market exposure.</p> <p>Investors, is expected to earn monthly income from renting the properties, while they have the opportunity to increase their capital by selling the property on the Resale market.</p> <p>The minimum investment is £50.</p>
UK	<a href="#">RealFunds</a>	<p>Real-Funds is self defined as a peer-to-peer lending platform for small and medium-sized house builders and is focused in London, UK residential buildings development projects. According to Real-Funds the expected net return for investors is 7%.</p> <p>The minimum investment is £100, while there is no maximum limit.</p>
UK	<a href="#">SyndicateRoom</a>	<p>Syndicate-Room is crowd funding platform that that supports real estate real estate investments.</p> <p>The minimum investment on Syndicate-Room is £1,000.</p>

Country / Region	Crowd funding scheme	Comments
Switzerland, Italy	<a href="#">Swiss-Crowd</a>	Swiss-Crowd is focus to real estate projects, mainly located in Switzerland and Italy. SWISS-CROWD business model allows a maximum of 20 people to take part in funding a project, resulting to 20 equal shares of 5%. An investor may own more than one of the 20 parts of the investments. According to Swiss-Crowd the expected profit for investors is higher than 6%. Swiss-Crowd offers investment opportunities mainly related to commercial buildings and complex constructions which requires big capital investments.
Sweden	<a href="#">Tessin</a>	Crowd-funding platform is focused to real estate investments, mostly in the form of secured loans.
UK	<a href="#">TheHouseCrowd</a>	The House-Crowd is a residential real estate crowd funding platform launched in December 2011, while it started trading in March 2012 and until March 2016 it has founded in excess of 170 projects. The House-Crowd offers two investment options: <ul style="list-style-type: none"> <li>- ownership of shares in a company (SPV) that owns the property, which offer variable returns, depending on rent received/maintenance and</li> <li>- loans with fixed annual rate 6 – 9%, depending on Loan To Value (LTV) ratio<sup>23</sup> Loans are secured by charge over property or land.</li> </ul> The minimum investment is £1,000. There is no maximum limit.
USA, UK	<a href="#">WealthMigrate</a>	Wealth-Migrate is a crowd funding platform with the expectation to be a “leading global real estate investment marketplace, giving investors direct access to exclusive real estate investment opportunities in premier markets around the world”. Wealth-Migrate has offices in USA, UK, China, Singapore, Australia and South Africa. Up to now and according to company’s website, Wealth-Migrate has materialized investments in USA and UK. According to Wealth-Migrate website, the expected average rate of return is 13%, for a minimum investment of \$10,000.

<sup>23</sup> Usually the higher the LTV, the higher the expected annual rate

Country / Region	Crowd funding scheme	Comments
France	<a href="#">WiSeed</a>	WiSeed is a crowd funding platform launched in 2008. Since 2011, WiSeed allows financing of real estate projects. The average annual returns are 8 – 15%, for time period of 12 to 24 months <sup>24</sup> . The minimum contribution (ticket) for lenders is €1,000.
Germany	<a href="#">Zinsland</a>	Zinsland is a real estate crowdfunding platform launched in 2014 and though it, have been already financed 10 Projects with approximately €4.6 million (July 2016) <sup>25</sup> . The average annual returns are 5 – 7%, for time period of 12 to 18 months. The minimum contribution (ticket) for lenders is €500.

**TABLE 3. MAIN CROWD FUNDING SCHEMES INVESTING IN REAL ESTATE PROJECTS**

Crowdfunding has already been used to finance building renovations and therefore it is assumed as potential source of equity of building energy retrofitting projects. One of the first successful real estate projects financed significantly through crowdfunding is the AKA United Nations building in New York<sup>26</sup>. In Europe and especially in UK, crowdfunding has been already used for real estate projects for a big number of projects (for example through platforms<sup>27,28</sup> “Invesdor”, “Wiseed” and “Companisto”). Significant help could be found through the “European Crowdfunding Network”<sup>29</sup>.

The range of maturity of crowd funding usually is in the range of 12 to 24 months, even many platforms allow projects with maturity of up to 60 months.

### 3.2.3. ADVANTAGES, DISADVANTAGES AND OTHER CONSIDERATIONS

The provision of equity in the project financing structure is a critical parameter that indicates the interest of investors and that it is competitive in market conditions. Usually, the projects are financed through debt and equity, expecting of having a maximum 60/40 debt to equity ratio, even this is not always the case. Debt and equity is supposed to be paid back from the cash flow generated by the project<sup>30</sup>. In the case of energy conservation, the cash flow is generated from the reduction of the running cost, mainly due to the significant lower buildings’ energy consumption.

It is important to notice that equity financing is distinct from debt financing, as with equity financing investors are taking a percentage of the enterprise, usually in the form of shares for a certain time period

<sup>24</sup> <https://www.wiseed.com/en/immobilier/haut-rendement>

<sup>25</sup> <https://www.zinsland.de/ueber-uns>

<sup>26</sup> <http://www.bloomberg.com/news/articles/2015-09-01/manhattan-s-first-condos-built-with-crowdfunding-arrive-near-un>

<sup>27</sup> <http://crowdsourcingweek.com/blog/top-10-equity-crowdfunding-platforms-in-europe/>

<sup>28</sup> <http://thesoholof.com/project/top-30-european-real-estate-crowdfunding-sites/>

<sup>29</sup> <http://eurocrowd.org/>

<sup>30</sup> “Key Differences Between Project Finance and Venture Finance”, In<sup>3</sup> Finance (<http://www.in3finance.com/project-vs-venture-finance-for-startups>)



(exit point) or indefinite time. A simplified but typical financing structure of a construction project<sup>31</sup> could be seen in the following figure<sup>32</sup>.

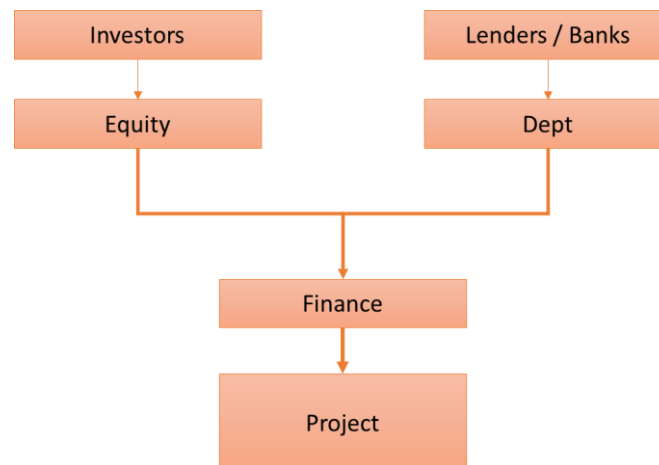


FIGURE 5. SIMPLIFIED BUT TYPICAL FINANCING STRUCTURE OF CONSTRUCTION PROJECT

The disadvantages of project financing with equity are consequences of the fact investors become shareholders of the project and therefore:

- investors could participate to the management,
- they expect a rather high economic performance,
- in many case they are interesting for big projects,
- the project financing scheme requires the setup of a SPV (Special Purpose Vehicle) which could be more complicated and have higher operational expenses comparing with lending.

On the other hand, project financing with equity is a very efficient way for financing and managing, especially construction projects, as it is focus to the achievement of a positive cash flow that ensure the repayment of the lenders and investors. Some very strong advantages of this type of financing are:

- it provides the appropriate cash that could contribute for making the project bankable,
- the execution of a detailed and thorough due diligence that protect the project and the investors,
- it requires a sound business plan, which could be useful in terms of planning and especially of risk management,
- it is a clear indicator that the project is interesting for the market and that could attract more investors.

<sup>31</sup> "Project Finance", Fred Moavenzadeh, MIT OpenCourseWare (<http://ocw.mit.edu/index.htm>)

<sup>32</sup> Public-Private-Partnership in Infrastructure Resource Center (<http://ppp.worldbank.org/public-private-partnership/about-pppirc>)

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In the case of crowdfunding, the fact that the business plan should be more or less public could be a disadvantage, as it will be known to the competitors, but the big number of small investors could be positive for management, as none of them could be a principal shareholder and therefore involved to the management.

### 3.2.4. CASE STUDIES

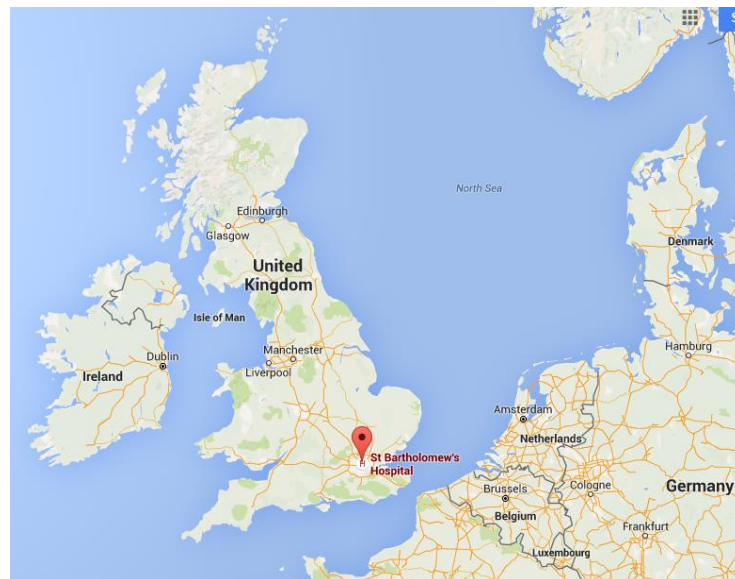
#### 3.2.4.1 ENERGY EFFICIENCY FUND

**Sector** Energy efficiency project - Hospital

**Project** St. Bartholomew's hospital, in London UK, has been done an energy retrofitting in order to reduce the energy cost, the GHG emissions and meet better the needs of its employees and patients.

This project has been funded with an Energy Performance Contract and financed by an external fund, which invested 100% of the required capital cost.

**Localization**



**Type of Investment** SDCL investment business *"has provided £2.5m finance for Skanska, a leading international engineering contractor, to deliver a low carbon combined chilling/heating and power (CCHP) solution at the iconic hospital"*<sup>33</sup>.

**Project figures and main expected results** SDCL provided £2.5m, 100% of the capital cost of the project, for financing the installation of a low carbon combined chilling/heating and power (CCHP) solution at St. Bartholomew's hospital. "CCHP is an optimal approach to generating lower carbon electricity and heat under the recent EU Energy Efficiency Directive. The project is expected to provide significant carbon emission reductions"<sup>43,34</sup>.

Total budget: €3,437,860<sup>35</sup>

Contract duration: 7 Years

Annual guaranteed savings: €675,100 (£493,000)

Design and operational risks transferred to the (UK Energy Efficiency Investments) Fund<sup>36</sup>

<sup>33</sup> <http://www.sdcl-ib.com/case-study/bartholomews/>

<sup>34</sup> <http://www.sdcl-ib.com/sustainable-development-capital-announces-landmark-energy-efficiency-deal-for-st-bartholomews-hospital-in-london/>

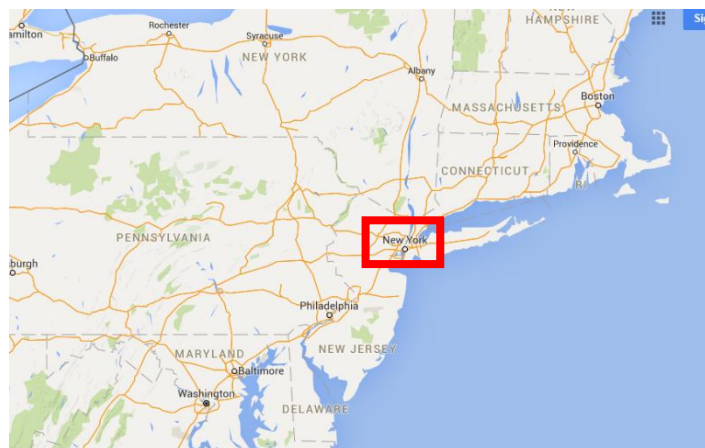
<sup>35</sup> <http://www.google.gr/url?url=http://www.transparens.eu/download-library/nhs-trust-uk&rct=i&frm=1&q=&esrc=s&sa=U&ved=0ahUKEwirobWGPnFoAhWBmBQKHtV1D0wQFggtMAQ&usg=AFQjCNHOLZgRbSaBuEAuLQfEJdLwmHS3dg>

### 3.2.4.2 CROWD FUNDING

**Sector** Real Estate Project

**Project** The “AKA United Nations” is an extended-stay hotel-condominium located in New York, USA. The money has been collected using the real estate crowd funding platform [Prodigy Network](#)<sup>37, 38, 39</sup>.

**Location** New York, USA



**Type of Investment** Real estate project financed significantly through crowd funding

**Project figures** Total budget: \$95 million

Crowd funding: \$12 million from 116 backers, each pledging at least \$20,000.

The minimum investment was \$10,000 for an investing time period ranging from 12 to 24 months. According to [Prodigy Network](#) the projected IRR is 19 – 23%<sup>40</sup>, mostly from sales of the hotel units and some from hotel fees<sup>41</sup>.

<sup>36</sup> <https://www.hse.ie/eng/services/news/newsfeatures/healthsustainabilityoffice/Resources/WorkshopDecDH.pdf>

<sup>37</sup> “Prodigy Network”: Real Estate Crowd Funding (<https://www.prodigynetwork.com>)

<sup>38</sup> <http://www.bloomberg.com/news/articles/2015-09-01/manhattan-s-first-condos-built-with-crowdfunding-arrive-near-un>

<sup>39</sup> <http://time.com/money/4019013/crowdfunded-condo-aka-united-nations-new-york/>

<sup>40</sup> <https://www.prodigynetwork.com/en/properties.aspx>

<sup>41</sup> <http://www.crowdfundinsider.com/2015/09/73762-first-crowdfunded-condos-for-manhattan-aka-united-nations-raised-funds-through-aka-united-nations/>

### 3.3. DEBT AND GUARANTEES

#### 3.3.1. GENERAL DESCRIPTION

According to the Cambridge Advanced Learner's Dictionary & Thesaurus<sup>42</sup>, debt is *"something, especially money, that is owed to someone else, or the state of owing something"*. A financial guarantee, *"is a guarantee of an obligation of a legally separate entity or individual, including a blended or discretely presented component unit, which requires the guarantor to indemnify a third-party obligation holder under specified conditions"*<sup>43</sup>. A loan could be guaranteed either by a third party or by collaterals provided by the borrower, in the event that the borrower defaults.

Loans are a form of money debt that can be used for real estate projects. In that case, usually the borrower has to provide a kind of guaranty to the lender and repay the loan and the amount of the agreed interest. Sometimes loans could be guaranteed by a government agency. That potentially reduces the financial risk for the financial institution and could make the project marketable. So, government or other organizations provision of guarantee work as facilitator.

#### 3.3.2. BRIEF DESCRIPTION OF MAIN FORMS OF DEBT AND GUARANTEES

The main forms of debt and guarantees are:

- Bank loans and Guaranteed
- Municipal bonds and Project Bond
- Leasing

##### 3.3.2.1 BANK LOANS AND GUARANTEED

A loan guaranteed by different types of collaterals or / and a third party in the event that the borrower defaults is the most common type of financing for companies and individuals. Sometimes the guarantee of loan is offered from the general government or a public authority. In any case the money that is provided from the financial institution is characterized as debt.

Even if guarantees could cover the total amount of the loan and the expected profits, it is the least desirable solution for the lender. The reason is that the time and expenses in order to liquefy the collaterals into cash could be long and the procedure could affect the reputation of the financing institution. In general, the regular repayment of a loan is crucial for the profitability of financial institutions as it allows them to reuse the money by giving new loans (revolving effect).

Supposing the government or a public authority has the ability to provide a certain amount of money to support an action it has two possibilities; provide the money through commercial banks for loans or as guarantees for loans. In both cases, the amount of money that will be lent by the borrower is considered as debt. In all cases, the borrower should be bankable under the common practice and the project itself financially viable.

The provision of (cash) guarantees could be critical for the implementation of an investment as:

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<sup>42</sup> Cambridge Dictionary (<http://dictionary.cambridge.org/>)

<sup>43</sup> Washington State Auditor's Office ([https://www.sao.wa.gov/local/BarsManual/Documents/GAAP\\_p3\\_FinGuarantees.pdf](https://www.sao.wa.gov/local/BarsManual/Documents/GAAP_p3_FinGuarantees.pdf))

- (1) in many times the potential borrower cannot provide sufficient or/and appropriate collaterals,
- (2) it could reduce the financing cost (interest rate) since a share of the risk is covered by the cash collateral.

Even so, the most critical disadvantage of cash collateral (guarantee) is that it is useful only for projects that are already financially viable.

As long as the general government or any other public authority, except from the borrower, provides cash in the project, this is assumed that it is in the form of a grant.

The guarantees, which could secure a loan, have different forms, which are not valued the same by the lender. The main differences between the several types of guarantees (collaterals) are due to their market evaluation during the time of the repayment and how easy or difficult is to liquidate them (become cash). So, the most desirable type of collateral is cash. In the list below are given the suitable types of collaterals (guarantees) concerning municipalities' projects. The types of collaterals are given in priority order for the lender. In practice, only the three first types of collaterals are generally accepted by lenders for municipalities' loans.

#### Suitable types of collaterals concerning municipalities

- (a) Cash and cash equivalents**
- (b) Marketable securities**
- (c) Accounts receivable**
- (d) Real Estate
- (e) Equipment
- (f) Third-party guarantees (Letter of Comfort)

The first three types of collaterals provide a more or less efficient way of dealing with the main risks:

- i. a reliable with low fluctuation over time valuation of the collateral,
- ii. fast liquidation (sell for cash) of the collateral
- iii. legal or bureaucratic problems that makes the collateral unusable (unenforceable)

#### Cost of financing with debt

The cost of financing is rather high, comparing with other financing sources. The final cost is related to:

- i. the interest rate and
- ii. other requested expenses, such as insurances, potential collaterals' evaluation expenses and application fees

### Lending interest rate estimation in Jul 2016

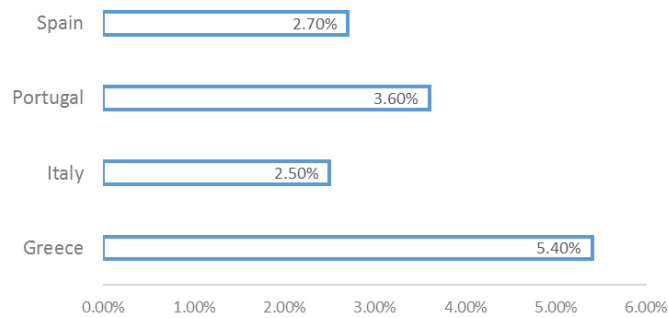


FIGURE 6. ESTIMATION OF AVERAGE MORTGAGE INTEREST RATES IN JUL 2016 (<http://www.tradingeconomics.com>)

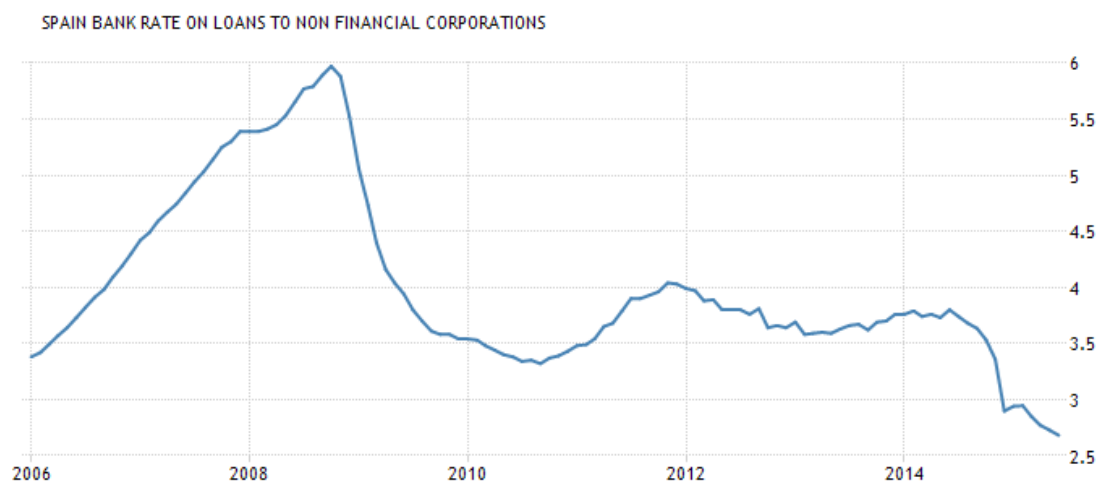


FIGURE 7. ESTIMATION OF THE EVOLUTION OF LENDING INTEREST RATES IN SPAIN (<http://www.tradingeconomics.com>)



FIGURE 8. ESTIMATION OF THE EVOLUTION OF LENDING INTEREST RATES IN PORTUGAL (<http://www.tradingeconomics.com>)



FIGURE 9. ESTIMATION OF THE EVOLUTION OF LENDING INTEREST RATES IN ITALY (<http://www.tradingeconomics.com>)



FIGURE 10. ESTIMATION OF THE EVOLUTION OF LENDING INTEREST RATES IN GREECE (<http://www.tradingeconomics.com>)

### Debt financing for Energy Efficiency Projects

Debt financing in the form of loans provides “*liquidity and direct access to capital which can be more relevant for energy efficiency measures attached to high upfront costs, especially in deep renovation projects*”<sup>44</sup>. Under normal conditions debt financing has relative high transaction costs and preferable maturity up to 10 years and therefore it is not appropriate for relatively small projects and for supporting

<sup>44</sup> “Financing building energy renovations, Current experiences & ways forward”, 2014, JRC Science and Policy Reports, Marina Economidou and Paolo Bertoldi



deeper measures that require long financing periods. This is more intensive for deep energy retrofitting projects that are focused to nZEB.

Additionally, it has to be mentioned that debt financing requires standard loan collaterals, such as pledge on buildings, fields and/or movable property, claims on accounts, financial risk insurance, bank guarantees and others. Especially for municipalities, in some countries is rather unfamiliar to take pledge on public buildings, which makes debt financing in the form of loans more difficult for public authorities comparing to private companies.

### 3.3.2.2 MUNICIPAL BONDS

A municipal bond is a debt security issued by a municipality to finance its capital expenditures.

The questions that arise and are important when investigating if a Municipality should consider issuing a Bond are the following:

- ❖ Which are the economic/financial factors determining Municipal bond yields?
- ❖ Which are the economic/financial factors determining Municipal sub-sovereign credit ratings?
- ❖ Is the specific creditworthiness of a specific Municipal Authority relevant in influencing its bond yields?
- ❖ Does the Member States Government credit rating affect the bond yields?
- ❖ Do investors in municipal bonds price differently rated and unrated bonds?
- ❖ Is the financial market able to impose debt discipline on the local authorities?

The research by Pinna, Massimo (2015) “The Municipal Bond Market in Italy: an empirical analysis of the determinants of yields and credit ratings”, aims to empirically identify the economic and financial variables which affect bond yields and credit ratings of Italian local governments, and to understand the role of such variables in explaining the differences in interest costs paid by different bond issuers.

The case of Italy: The financial market for local governments in Italy has grown significantly in the last fifteen years. The introduction of new regulation in the mid-1990s has seen a boost in bond financing by Italian cities, provinces and regions.

The bond market for local administrations has increased from 6 pilot issues in 1996 for a total amount of €227million to a long-term average before the financial crisis of 2008 to 150-200 issues per year for a total of €5-7billion per year. In December 2014, the overall amount of municipal outstanding bonded debt was around €25billion with credit rating assigned by the major international agencies.

In Italy, as in all four countries under investigation, Municipalities are entitled to establish and collect their own taxes and revenues within their territory for the services they provide to their citizens (garbage collection, street lightning, municipal police, local transportation etc). Certain Municipalities are wealthier than others if they have other sources of revenues such as marines’ exploitation, property management, investment return and rents or high municipal taxes. In many cases the central government may allocate additional resources according to broader strategy and needs. Local authorities may also incur debt in order to finance investment expenses and their indebtedness is not guaranteed by the central government.

The Italian system has a special procedure for local authorities in financial distress similar to the private sector bankruptcy procedure, under which municipalities are subject to the rigorous control of an external committee which manages the financial position.

#### Italian municipal bond market at a glance

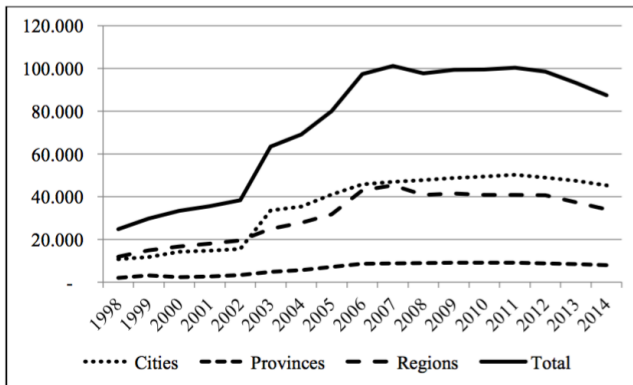


FIGURE 11. ITALIAN LOCAL GOVERNMENT DEBT BY GOVERNMENT TYPE (€ MILLIONS)

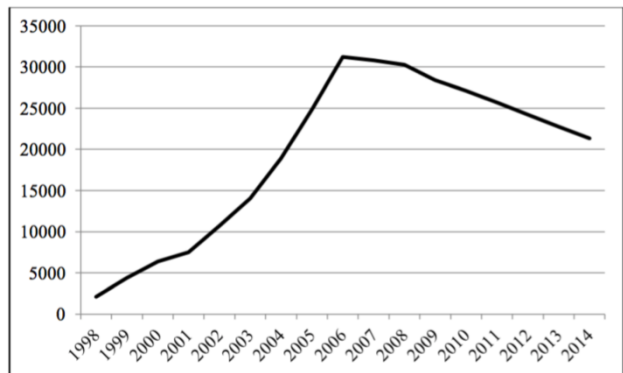


FIGURE 12. OUTSTANDING MUNICIPAL BONDS (€ MILLIONS)

The effect of the financial crisis on municipal bond issuance is clearly represented in the following Graph II.3, which reports the amount of municipal bonds issued per year in the Italian market.

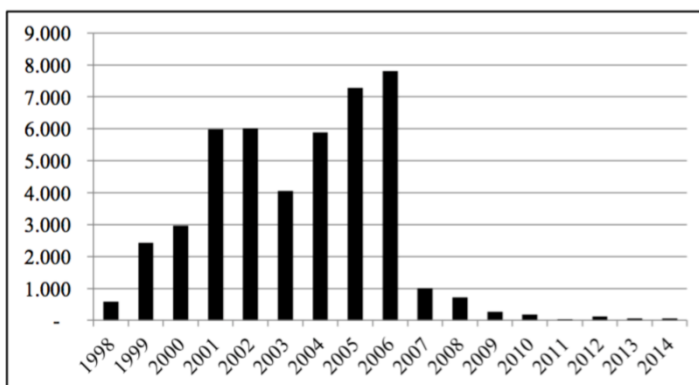
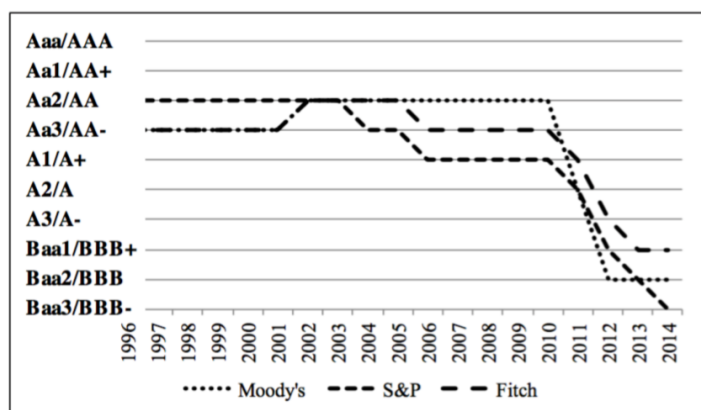


FIGURE 13. MUNICIPAL BOND ISSUANCE INCREASED STEADILY FROM 1990S TO 2006 WHERE IT REACHED THE MAXIMUM OF €8BILLION IN A YEAR. STARTING 2007 THE YEARLY AMOUNT DECREASED TO AROUND €40 MILLION IN 2014.

FIGURE 14. AFTER 15 YEARS OF STABILITY, THE THREE RATING AGENCIES HAVE DOWNGRADED ITALY STARTING IN 2011, FOLLOWING THE RECENT EURO-ZONE SOVEREIGN DEBT CRISIS. BY THE END OF 2014 ITALY'S RATINGS HAVE MOVED FROM THE HIGHEST CATEGORY TO THE EDGE OF THE INVESTMENT GRADE LEVEL. SIMILAR IS THE CONDITION FOR THE OTHER MEMBER STATES UNDER REVIEW.



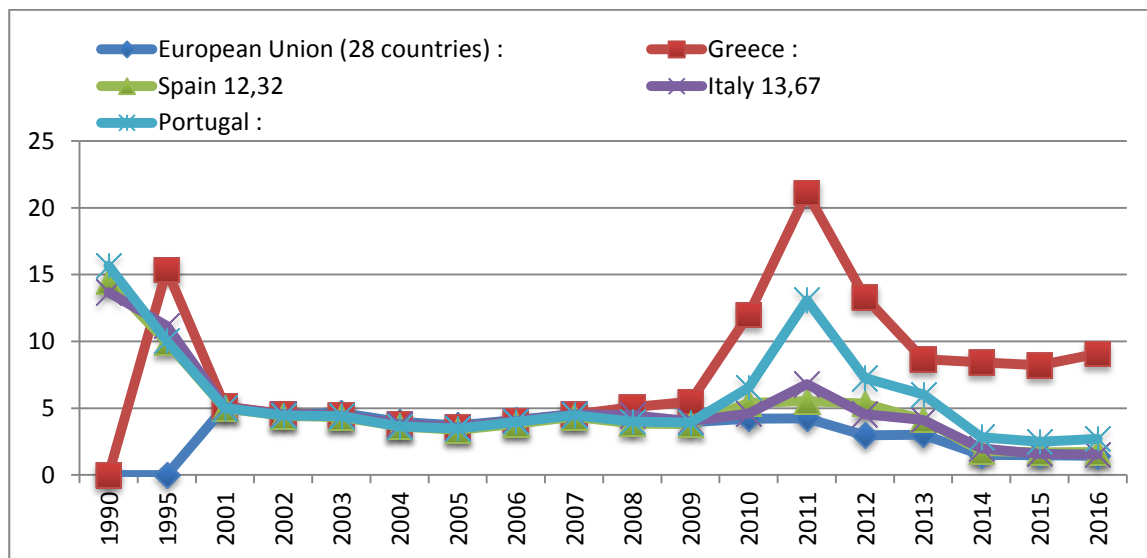


FIGURE 15. EMU CONVERGENCE CRITERION BOND YIELDS (%) – MONTHLY DATA (SOURCE: <http://ec.europa.eu/eurostat/web/main/home>)

They refer to central government bond yields on the secondary market, gross of tax, with a residual maturity of around 10 years

### The relationship between risk and municipal bond yields

According to academic literature on municipal bond pricing, when the borrower is a local authority i.e. an authority which raises revenues by collecting taxes on a specific area, receiving support from the Central Government and it charges for the municipal services, then several factors must be considered in order to assess if it be able to serve its debt.

According to ongoing research the basic factors are the following:

Accounting and financial:

- Debt load as a ratio of the debt over revenue (total inflows)
- Debt service – annual expenses in interest and capital repayment (interest rates of existing loans)
- Current and capital balances – whether the local authority is generating or absorbing cash from its operating activity, cash which could be used for debt repayment

Fiscal variables

- Tax revenues – expressed in per capita terms which is the most important source of revenues for a local government
- Degree of fiscal autonomy – a ratio meant to describe the level of own revenues compared to the transfers from the central government

#### Socio-economic variables

- Local income – usually GDP per capita, indicators of local income are important to evaluate how much taxes per citizen the municipality can collect. Wealthy territory, higher taxes that can be collected
- Population – the higher the number of people the more negotiating power a municipality has and the more familiar it usually is with the financial markets
- Unemployment – an indicator expressed as a percentage which is a strong indication of the strength of a municipality

According to the analysis performed, the rating distribution is the following for rating category, government type and rating changes.

Benefits for issuers	Benefits for investors
<ul style="list-style-type: none"> <li>• Mobilizing resources</li> <li>• This source of financing is cheaper than conventional borrowing from banks</li> <li>• It is issued to finance projects that generate revenues or savings to cover the deficit of the municipal budget</li> <li>• Accelerate the local and regional economic growth</li> <li>• Improve the economic situation of the municipality or local citizens</li> <li>• Gain greater financial independence from the central government</li> </ul>	<ul style="list-style-type: none"> <li>• Return that depends on the maturity and the quality of the issuer</li> <li>• Risk investment measurable through the rating of the investors</li> <li>• Liquidity</li> <li>• Relatively high earnings</li> <li>• Development of capital market and better opportunities for diversification of portfolios</li> <li>• The return is exempt from personal income tax</li> <li>• In some cases investing in development environment in which they live</li> </ul>

TABLE 4. ADVANTAGES OF ISSUING AND BUYING MUNICIPAL BONDS

	2005	2008	2013	Pooled
Italy's rating	Aa2/AA-/AA	Aa2/A+/AA-	Baa2/BBB/BBB+	-
<b>Rating Category</b>				
Aaa/AAA	-	5	-	5
Aa1/AA+	7	2	-	9
Aa2/AA	12	8	-	20
Aa3/AA-	41	35	-	76
A1/A+	14	32	-	46
A2/A	15	17	4	36
A3/A-	4	4	3	11
Baa1/BBB+	2	3	15	20
Baa2/BBB	1	1	22	24
Baa3/BBB-	-	-	5	5
Ba1/BB+	-	-	3	3
Ba2/BB	-	-	1	1
Ba3/BB-	-	-	1	1
B1/B+	-	-	1	1
<b>Total</b>	<b>96</b>	<b>107</b>	<b>55</b>	<b>258</b>
<b>Government Type</b>				
Regions	35	37	35	107
Provinces	23	27	5	55
Cities	38	43	15	96
<b>Total</b>	<b>96</b>	<b>107</b>	<b>55</b>	<b>258</b>
<b>Rating Changes</b>				

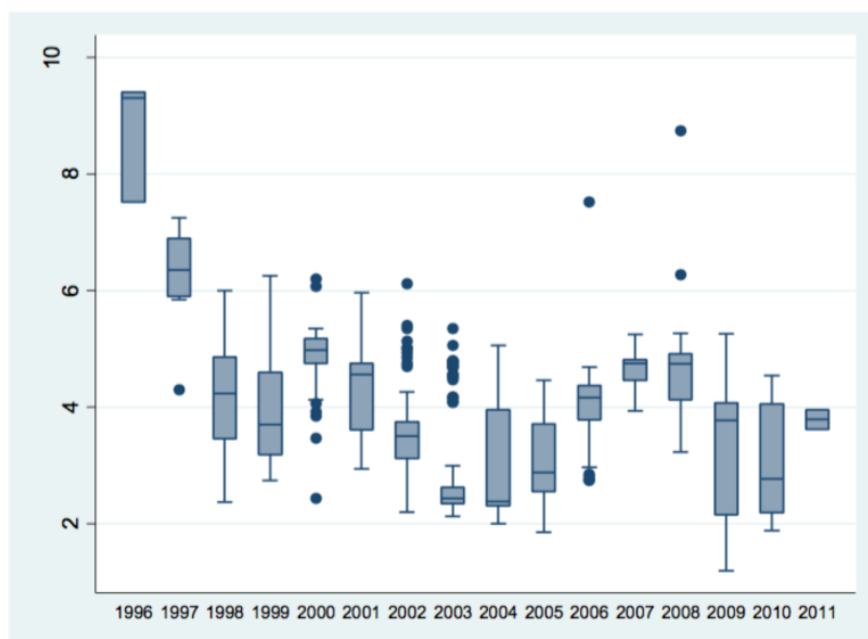


FIGURE 16. MUNICIPAL BOND YIELDS IN ITALY FOR PERIOD 1996-2011 (SOURCE: RATIONAL BAILOUT EXPECTATIONS IN THE ITALIAN MUNICIPAL BOND MARKET, MASSIMO BORDIGNON CATHOLIC UNIVERSITY MILANO & CESIFO MUNICH)

The conclusion of this research which investigated the factors that determine the bond yield that a municipality must offer in order to attract investors in accordance to its credit rating. An indication based on the Italian market but with the same principles holding for the other EU Member.

What is evident is that investors apply different pricing schemes to municipalities which is not in accordance to each municipality's financial conditions but is more closely linked to the country's government risk. That leaves little or no role to the individual municipality's financial and fiscal characteristics of the issuer. From a systemic point of view, highly indebted local authorities are not penalized in terms of interest cost since the Government is considered to bail them out while on the other hand more credit worthy ones are constrained by the sovereign risk of each Member State.

However, the rating assigned by international rating agencies are found to have an effect on the pricing the issuer is paying with *ceteris paribus*, investors requesting 10bp (i.e. 0.1%) less yield for rated bonds. The specific rating assessment assigned to an issuer (i.e. AA-, BBB+ etc) nonetheless does not seem to have an effect on the yields. It is very important for municipalities to keep in mind that the existence of a rating increased the marketability of an issue in the secondary market.

It is also evident that municipalities' debt was downgraded not because of a change in the financial conditions of the municipalities themselves but because of the downgrade of the Central Government.

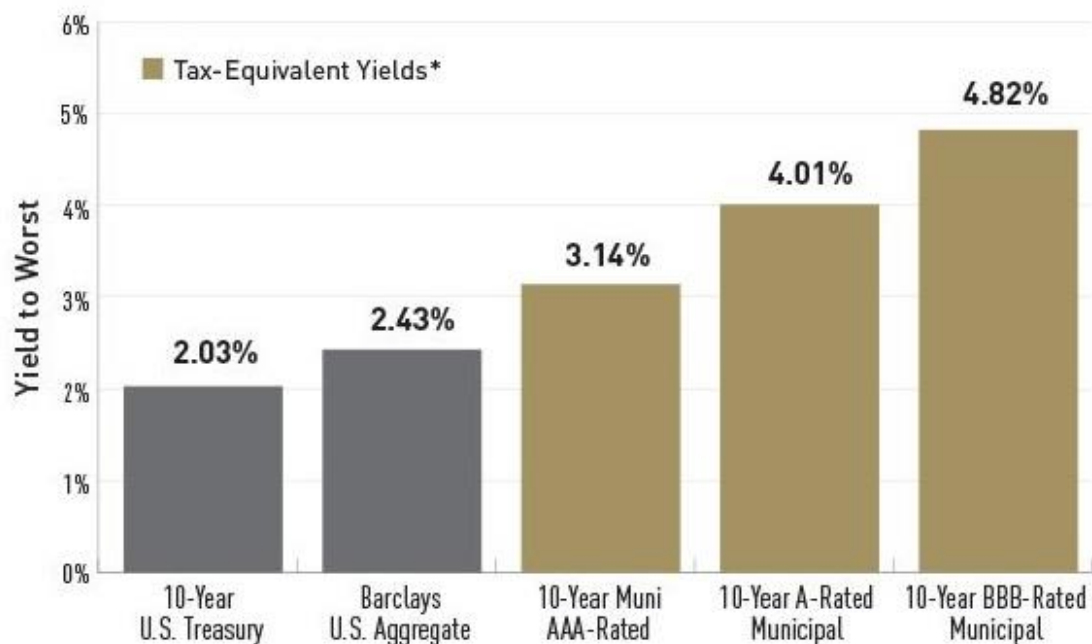


FIGURE 17. TAX-EQUIVALENT YIELDS (SOURCE: BARCLAYS AND BLOOMBERG)

#### Other references

1. ["The Municipal Bond Market in Italy: an empirical analysis of the determinants of yields and credit ratings"](#)

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2. [“The market for new issues of municipal bonds: The roles of transparency and limited access to retail investors”](#); Paul Schultz
  3. [“Assessing financial distress where bankruptcy is not an option: An alternative approach for local municipalities”](#); Sandra Cohen, Michael Doumpos, Evi Neofytou; Constantin Zopounidis

### 3.3.2.3 PROJECT BONDS FOR ENERGY EFFICIENCY

The use of project bond to finance renewable energy and energy efficiency projects could be a powerful tool for future clean energy investment<sup>45</sup>. European Commission introduced the Europe 2020 Project Bond in 2012 which Initiative aims to revive and expand capital markets to finance large European infrastructure projects in the fields of transport, energy and information technology<sup>46</sup>. The pilot phase of the EU-EIB Project Bond Initiative was established by [Regulation No. 670/2012](#) and is being implemented by the European Investment Bank (EIB). EU-EIB Project Bond Initiative is focused to specific infrastructure needs in transport, energy and broadband networks and therefore it is not clear that it is an appropriate tool for financing buildings energy retrofitting. The Figure below shows the projects closed as of 31 July 2015 using the EU-EIB Project Bond Initiative. Since August 2015 they have been supported three more projects:

1. West of Duddon Sands offshore wind farm transmission assets<sup>47</sup>
2. The construction of N25 New Ross bypass, the first project to be financed through project bond credit enhancement in Ireland<sup>48</sup>
3. The refinancing of Passante di Mestre Motorway in Italy<sup>49</sup>

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<sup>45</sup> [“Clean Energy Finance Through the Bond Market: A New Option for Progress”, BROOKINGS-ROCKEFELLER, Lewis Milford, Devashree Saha, Mark Muro, Robert Sanders, Toby Rittner](#)

<sup>46</sup> [http://ec.europa.eu/economy\\_finance/financial\\_operations/investment/europe\\_2020/index\\_en.htm](http://ec.europa.eu/economy_finance/financial_operations/investment/europe_2020/index_en.htm)

<sup>47</sup> <https://www.ofgem.gov.uk/publications-and-updates/ofgem-grants-licence-west-duddon-sands-offshore-wind-farm-s-269m-transmission-assets>

<sup>48</sup> <http://www.eib.org/infocentre/press/releases/all/2016/2016-019-eib-green-light-for-n25-new-ross-bypass.htm>

<sup>49</sup> <http://www.infrastructuredebt.co.uk/en/Documents/PdMestrePressRelease.pdf>

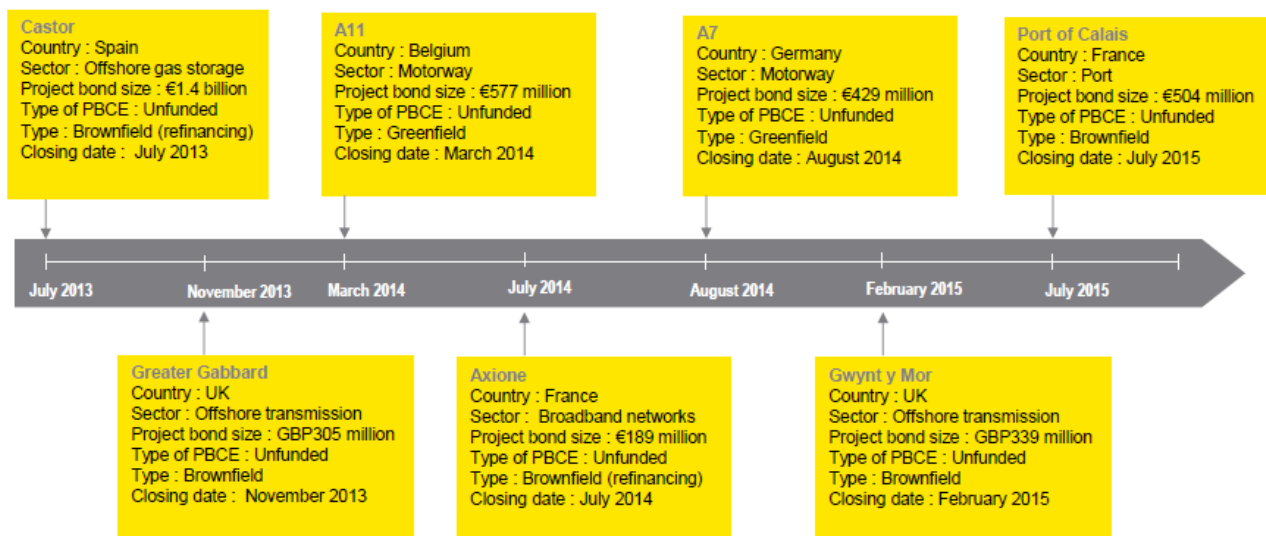


FIGURE 18. EU-EIB PROJECT BOND, PROJECTS CLOSED AS OF 31 JULY 2015<sup>50</sup>

For the time being (July 2016) the issue of project bonds for energy efficiency has been allowed in USA, even it is always an available financial tool for any kind of projects. The issue of Project Bonds for energy efficiency bonds is regulated through the “Local Government Energy Efficiency Project Bond Act” which provides enabling legislation for a municipality or a county to issue energy efficiency project bonds. According to the “Local Government Energy Efficiency Project Bond Act”, “the local government may use these bonds to finance energy efficiency projects that i) provide guaranteed energy cost saving via reducing energy consumption or operational cost, and ii) to purchase and install energy efficiency projects. Local governments are authorized to enter into “guaranteed energy cost savings contract”, also popularly known as Energy Performance Contracting (EPC). The energy efficiency project can be for both new and existing facilities, which must be designed to reduce consumption of energy or national natural resource or result in operating cost savings of the changes. These changes must be measurable and verifiable under the international performance measurement and verification protocol and must be measured and verified by an audit performed by an independent auditor.

The local legislative body may only issue bonds after it determines that i) all of the energy efficiency project will be performed by a qualified providers, and ii) the qualified provider has provided a guarantee of the operating cost savings to be realized from the project. If the savings fail to meet the expected goal, then the provider must reimburse the shortfall. The bonds may be issued for a maximum of 20 years, or the useful life of the project<sup>51</sup>. An example of using Project Bonds for energy efficiency is available in Philadelphia, USA, where bonds have been issued in order to finance the upgrade of the lighting and control systems and implement water conservation measures in four buildings<sup>52</sup>. According to the given data, the relevant key financial information is<sup>53</sup>:

<sup>50</sup> “Ad-hoc Audit of the Pilot Phase of the Europe 2020 Project Bond Initiative”, 2016

<sup>51</sup> <http://energy.gov/savings/local-option-energy-efficiency-project-bonds>

<sup>52</sup> “Municipal Energy Efficiency and Greenhouse Gas Emissions Reduction: Financing and Implementing Energy Efficiency Retrofits in City-Owned Facilities”, Environmental Financial Advisory Board



- Capital cost of the investment approximately \$12.6 m
- \$6.25 m of the capital cost have been raised through the issuance of 15 years Project Bonds
- The net interest for the bonds is 2.31%
- The issuance costs were 1.9%
- Yield due to energy savings is expected to be around 18% for the two buildings and at least 24% for the other two buildings, resulting to more than \$10 m over the 15 years<sup>54</sup>
- Bond rating A2 by Moody's (the same as the City's General Obligation rating)

### Bond rating and interest rate

Bond rating is way to evaluate the risks related to the project and the issuer. The lower a bond's rating, the greater the risk of default and therefore bonds with lower ratings typically pay higher interest rates than those with higher ratings. Also under most market conditions, bonds with longer terms tend to pay higher interest rates. The assessment of bond rating is carried out by specialized companies, such as [Standard & Poor's](#), [Moody's Investors Service](#) and [Fitch Ratings](#)<sup>55</sup>. Bond rating companies use slightly different methods to rate bonds.

Standard & Poor's uses capital letters from A to D, with AAA being the highest rating and D the lower. Any bond up to BBB is considered investment grade, while any rating of BB or lower is speculative grade. Moody's uses letters (both, capital and small letters) and numbers to rate bonds, with Aaa being the highest rating and C the lowest. Smaller variations in risk are ranked with the numbers (1 to 3). Moody's assumes any bond with ratings up to Baa as investment grade.

As long as Project Bonds rating follows the rating of the country or the municipality, then Project bonds is a financial tool that will be difficult to be used in Greece (the current period – July 2016) and easier to other three Member States participating to the Project (Italy, Portugal, Spain), as they have significant higher ratings and acceptable as investment grades. The following table shows the rating of the four Member States participating to the Project, as well as of Germany, in accordance to Standard & Poor's, Moody's Investors Service.

	Germany	Greece	Italy	Portugal	Spain
Standard & Poor's	AAA	B-	BBB-	BB+	BBB+
Moody's	Aaa	Caa3	Baa2	Ba1	Baa2

TABLE 5. GOVERNMENT RATING ACCORDANCE TO STANDARD & POOR'S, MOODY'S INVESTORS SERVICE (TRADING ECONOMICS<sup>56</sup>)

[https://www.epa.gov/sites/production/files/2014-04/documents/efab\\_report\\_municipal\\_energy\\_efficiency\\_ghg\\_emissions\\_reduction.pdf](https://www.epa.gov/sites/production/files/2014-04/documents/efab_report_municipal_energy_efficiency_ghg_emissions_reduction.pdf)

<sup>53</sup> "Using QECBs for Public Building Upgrades: Reducing Energy Bills in the City of Philadelphia", Environmental Energy Technologies Division, Lawrence Berkley National Laboratory, Zimring, Mark and Merrian Borgeson

<https://emp.lbl.gov/sites/all/files/financinglbl-gov-reports-public-building-qecb.pdf>

<sup>54</sup> Expected energy savings over the 15 year period are not discounted for the time value of money

<sup>55</sup> <https://www.scottrade.com/knowledge-center/investment-education/investment-products/bonds/measuring-bond-value/bond-ratings.html>

<sup>56</sup> Trading Economics (<http://www.tradingeconomics.com/>)

### 3.3.2.4 LEASING

An alternative financing source for both an Energy Efficiency Project Developer but also for the final user himself is the option for leasing the project equipment. Leasing can be described as a financial tool where the host obtains the use of machinery, vehicles or in our case highly energy efficient equipment on a rental basis. This avoids the developer's need to invest its own capital in the equipment. Ownership remains in the hands of the lessor (financial institution or leasing company) while the municipality enjoys the use of the equipment. In the case of energy efficiency, it can be used to overcome the issue of higher upfront costs for energy efficiency investments, as payments in a lease merges into one payment both capital and operational expenditures.

Leasing – off balance sheet financing.

Leasing is a tool that can support the uptake of expensive energy efficient equipment purchase for project developer (Municipality or company). It works as an off balance sheet treatment of lease which wraps together the interest payment, capital repayment and often maintenance payments into one which makes it simple and capital efficient for the project developer to manage. The current fiscal conditions allow for an accelerated depreciation of the equipment which delivers certain benefits for corporate developers. In more detail the purchase of equipment through a leasing contract allows the developer to amortize the equipment in shorter period (usually within the duration of the lease agreement) instead of having to follow the depreciation rule of the specific equipment which can be 10 years or more. In such cases the developer can be released earlier from the agreement and proceed to the next project in shorter time since he collects his investment at the rate the project allows regardless of what the fiscal and tax authorities consider. It allows the equipment to be included in the income statement as a lease expense, not on balance sheet as a purchase<sup>57</sup>.

<u>Mature Financial Instruments</u>	Commercial	Public	Public Rental	Private Rental	Owner Occupied
Dedicated Credit Lines	3	2	3	3	3
Energy Performance Contracting (Undertaken by Private Sector)	3	3	3	1	1
Risk-Sharing Facilities	2	1	2	2	2
Direct and Equity Investments in Real Estate and Infrastructure Funds	2	1	1	2	0
Subordinated Loan	1	1	1	1	1
Covered Bonds	1	1	1	0	0
Leasing	0	1	0	0	0

<sup>57</sup> "Setting the PACE: Financing Commercial Retrofits", Johnson Controls. (2013). Retrieved from: <http://www.institutebe.com/InstituteBE/media/Library/Resources/Financing%20Clean%20Energy/Setting-the-PACE-Financing-Commercial-Retrofits.pdf>

<b><u>Emerging Financial Instruments</u></b>	<b>Commercial</b>	<b>Public</b>	<b>Public Rental</b>	<b>Private Rental</b>	<b>Owner Occupied</b>
On-Bill Repayment	2	1	2	3	3
On-Tax Finance (PACE)	2	1	1	2	3
Energy Efficiency Investment Funds	3	2	2	1	1
Energy Services Agreement	3	3	2	1	1
Public ESCOS for Deep Renovation of Housing	0	0	3	2	2
Factoring Fund for Energy Performance Contracts	2	2	1	1	0
Public ESCOS for Deep Renovation of Public Buildings	0	3	3	0	0
Green Bonds	2	1	0	0	0
Citizens Financing	0	0	0	1	2

**TABLE 6. RESULTS OF THE EEFIG SURVEY ON FINANCIAL INSTRUMENTS FOR ENERGY EFFICIENCY INVESTMENTS**

### 3.3.2.5 EUROPEAN ENERGY EFFICIENCY FUND

In this paragraph, we present a brief description of the main characteristic regarding the European energy efficiency fund and then we provide an example of its use. On 1 July 2011, the European Commission, the European Investment Bank (EIB), the Cassa Depositi e Prestiti (CDP) and Deutsche Bank have announced the launch of the European Fund for Energy Efficiency (European Energy Efficiency Fund). The fund EEE-F will help EU Member States to achieve the goal that aims to reduce, by 2020, emissions of greenhouse gases and energy consumption by 20% and lead to 20% of the energy renewable. EEE-F is the central part of a new mechanism to promote sustainable energy for the European Parliament and the Council of Ministers.

The new instrument takes the form of an investment fund, structured as a SICAV, with an initial budget amounting to 265 million euro thus constituted:

- 125 million euro from the European Commission ("Junior Tranche" the Fund);
- 75 million euro from the EIB (Senior and Mezzanine Tranche Shares);
- 60 million euro from the Cassa Depositi e Prestiti (Mezzanine and Senior Shares);
- 5 million euro from Deutsche Bank (Mezzanine Tranche).

Moreover, an additional 20 million euro will be made available in the form of grants for technical assistance support to the definition of investment projects of size even less than 50 million euro.

The Fund aims to attract more private and public investors, in order to provide a wide range of financial products such as loans, guarantees and equity.

EEE-F finances and supports investment projects relating to the adoption of measures to:

- Energy efficiency (70% of resources);
- Renewable energy (20% of resources);
- Clean urban transport (10%).

Potential beneficiaries are local authorities or regional, public or private companies acting on behalf of public authorities, such as local energy utility, ESCo, or providers of district heating, cogeneration and public transport companies. An example project made in Italy is the University Hospital S. Orsola Malpighi. The project regards the upgrade of the entire energy system of the university hospital has been the largest

energy efficiency upgrade in Italy under a Public-Private Partnership (PPP) framework so far. For local public healthcare, it is a significant step forward, because the university hospital is one of the biggest hospitals, making it a role model for other hospitals around the country. It is a lighthouse project which demonstrates the positive impact of energy efficiency measures in public buildings.

TYPE	BENEFICIARIES	COUNTRIES	BUDGET
PPP	Municipalities	GR, IT, ES, PT	€146 Million

**TABLE 7. MAIN CHARACTERISTICS OF THE EUROPEAN ENERGY EFFICIENCY FUND**

### 3.3.3. ADVANTAGES, DISADVANTAGES AND OTHER CONSIDERATIONS

As it has been mentioned already, the use of debt and guarantees are focused to bigger investments as they have relative high transaction costs. Also, generally they have a preferable maturity up to 10 years and therefore it is not appropriate for relatively small projects and for supporting deep energy retrofitting projects. Even so, it is obvious that debt and guarantees are able to mobilize market money.

The clear advantages of debt for financing building retrofitting projects are:

- It can be cheaper than conventional borrowing from banks
- It is issued to finance projects that generate enough revenues or savings to repay the debt and therefore it is assumed that they could mobilize market money

Especially guarantees could help:

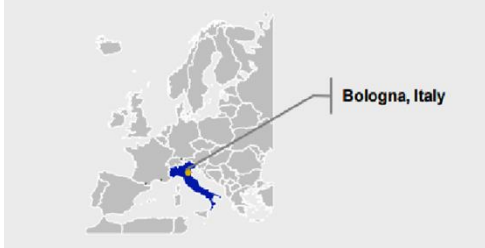

- project developers (or loan applicants) to access finance and reduce the cost of capital.
- financial institutions by providing additional comfort, in relation to technologies or project approaches where they have less experience.

The main disadvantages of debt financing are:

- it has relative high transaction costs,
- it has maturity time that is inappropriate for deep energy retrofitting.

Additionally, guarantees have the disadvantage that they don't provide any solution to liquidity problems.

### 3.3.4. CASE STUDIES

<b>Sector</b>	Energy efficiency – upgrade of entire energy system	
<b>Project</b>	Concession for the engineering, construction and operations of power plants, technological systems, works and services for Healthcare Campus «Policlinico S. Orsola-Malpighi», Bologna	
<b>Localization</b>	 	
<b>Type of Investment</b>	The intervention is focused on the renovation of energy production systems, with the construction of a new tri-generation power station able to produce thermal energy (hot and cold fluids) and of the distribution heating&cooling network. It is one of the largest energy efficiency upgrade in Italy under a PPP framework	
<b>Project figures</b>	Investment about 41 million euros, 32 of them funded by the European Fund for Energy Efficiency (EEEF Fund) through the issue of two project bonds, for a total period of 20 years.	
<b>Main results and evidences</b>	<ul style="list-style-type: none"> <li>4.863 TEP/for year, about 27% of energy savings, and reduction of about 14.457 CO2 emission</li> </ul>	

### 3.4. SUBSIDISED AND DEDICATED FUNDS

#### 3.4.1. PRODUCT DESCRIPTION

Subsidised and dedicated funds are financial instruments created to finance projects with positive financial returns but lower than “market standards”, in terms of:

- Financial returns (lower than market requirements);
- Pay back periods (longer than market requirements);
- Security package (non-coherent with market requirements);
- Project sponsor financial standards (lower than market requirements).

In order to **fill the market gap** and at the same time reducing the investment of grant resources, some innovative financial instruments were created, supporting projects to enhance their “financial quality” and therefore making them market attractive.

Subsidized Funds are usually:

- Created and finance by Public Institutions (European, National, Local Entities) and/or by Philanthropic Entities (e.g. Foundations, Charities, NGOs, etc.) in order to reach social and environmental targets;
- Managed by specialized entities (e.g. banks, Private Equity Funds, development banks, etc.) that in some cases co-finance the funds they manage.

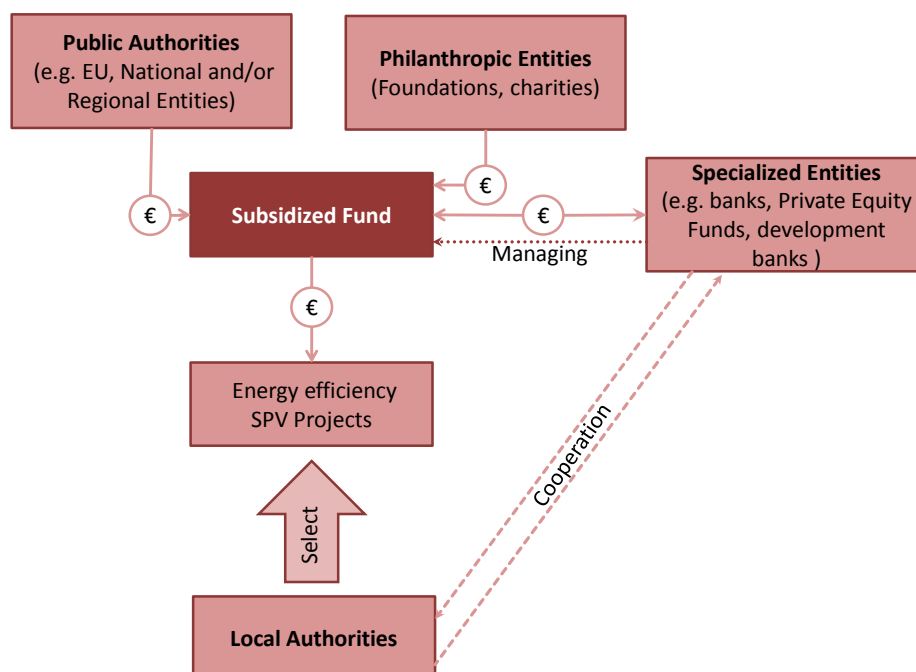


FIGURE 19. SUBSIDIZED FUND PROCESS

Subsidised Funds are usually created and backed by Public Entities (or in limited cases private philanthropic entities) in order to finance interventions with a wide public impact (e.g. environmental, social, etc.), but with a low positive financial returns (under market expectation).

It's not possible to find a homogenous definition of Subsidized Funds, because of their large differences explained in the following points; with a relative high level of generalization, it will be tried to define their main characteristics.

**Targets** – Subsidized Funds in several case play a pivotal role in the financial structuring of energy efficiency initiatives, because fill the gap between grant and market finance and therefore allowing initiatives to be financed. Therefore, typical aims of Subsidized Funds are:

- to reduce the use of grant financing, by means of revolving instruments (e.g. guarantees, lending, equity) that with positive financial returns expectation but lower than market instruments;
- to increase the cooperation between public and private institutions, with a knowledge sharing between the two parts;
- to attract private co-financing resources (fund managers may co-finance projects with their own resources).

**Financers/Investors** – Subsidized Funds are mainly backed by public and/or philanthropic entities, such as: EU Funds Managing Authorities (e.g. ERDF, ESF, EARDF, etc.), National Development Agencies, International Development Institutions, Foundations, etc.

These entities typically:

- Operate on the basis of investment plans to promote social/environmental conditions in a certain territory (e.g. Operational Programs, Development Plans, etc.);
- Finance several target projects and final recipients (e.g. promoting energy efficiency in public buildings via Public Partnership procedures financing ESCOs);
- Use the majority of their resources (e.g. ERDF, ESF, LIFE, etc.) as grant financing and some of the remaining as Subsidized Funds (e.g. soft lending, subsidized equity, etc.) via intermediaries (e.g. banks, guarantees insurers, Private Equity Funds, etc.).

**Fund Managers** – Subsidized Funds usually need professional fund managers (e.g. banks, Private Equity Funds, Financial Institutions, etc.) to be operative. This is due to:

- Legal constraints, in many Countries public entities (e.g. Managing Authorities) cannot operate as lenders and/or equity investor;
- Technical constraints, public entities involved in grant financing usually don't have experiences in selecting and structuring financially viable projects and investment contracts;
- Risk management, public entities can share/transfer project risks to fund managers that are usually more capable of managing it.

**Financial Products** – as anticipated in previous paragraphs, with the label “Subsidized Funds” it has been tried to define a wide range of financial products, briefly listed below:

- Equity (risk capital) is the most risky financial product because it is the “last financial source” to be repaid and therefore it is a very scarce asset class, especially in the energy efficiency sectors featured by low expected returns and many small undercapitalized ESCOs;
- Mezzanine financing is a hybrid form of financing (e.g. shareholder loans, convertible bonds, etc.). In energy efficiency initiatives it is supplied by equity investors, in order to mitigate the risk of their investment;
- Project loans, usually Subsidized Funds have softer requirements than banks in terms of: interest rate, duration and security packages;
- Guarantees and counter guarantees, these instruments (described in details in the next paragraphs) reduce the risk of the initiatives guaranteeing the financial sector;
- Other financial products that can be more close to grant financing are crowdfunding (that in certain case envisage a return for grantor), grant covering interests of market loans, etc.

**Final beneficiaries and project selection procedures** – as reported in previous paragraphs, public entities backing “Subsidized Funds” operate on the basis of investment plans to promote social/environmental conditions. These plans usually have rigid and structured procedures for the selection of projects and final recipients (e.g. public call for tenders, open candidatures, etc.).

Even though it could be not possible to remove all project selection constraints for “Subsidized Funds”, peculiar features of these instruments shall be considered, for instance:

- Project financial sustainability
- Project pay-back time
- Counterpart risk

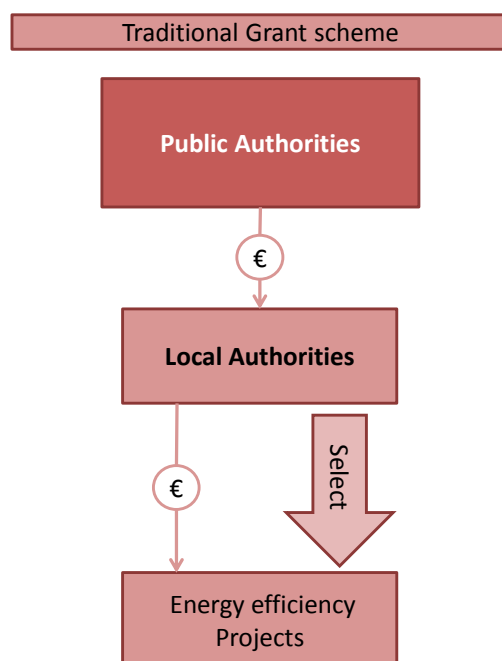


Figure 3 Traditional Grant Scheme



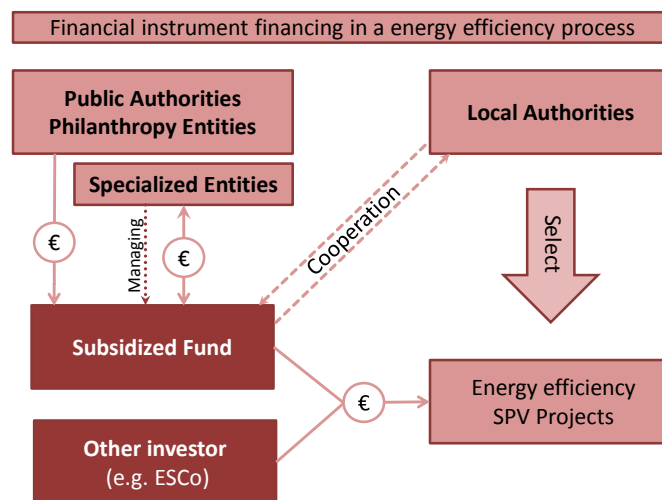


FIGURE 20. EXAMPLE OF AN ENERGY EFFICIENCY FINANCING PROCESS

**Monitoring and control procedures** – as written in the previous paragraph, public entities backing “Subsidized Fund” have rigid and structured monitoring and control procedures, that need to be adapted to the needs of Subsidized Funds.

Name of fund	Promoter	Beneficiary	Country of availability	Budget	Investment size	Suitability for nZeb
Private Finance For Energy Efficiency (PF4EE)	EIB, LIFE	Local authorities, SMEs, ESCOs, Utilities	ES, CZ, FR	€ 480 mln	< €5 mln	high
ESIF Financial Instruments (Former JESSICA)	EIB	Public authorities	Depends on operational program	Depends on operational program	Depends on operational program	high
EIB Intermediated Loans	EIB	Public and private sector	EU			medium
European Fund for Strategic Investments (EFSI)	EIB	Public and private sector	EU 28	€ 16 mln as guarantee € 5 bln as capital to co-invest	No restrictions	low

TABLE 8. MAIN EUROPEAN ENERGY EFFICIENCY SUBSIDIZED FUNDS AVAILABLE

## PRIVATE FINANCE FOR ENERGY EFFICIENCY (PF4EE)

Private Finance for Energy Efficiency (PF4EE) instrument is a joint agreement between the EIB and the European Commission which aims to address the limited access to adequate and affordable commercial financing for energy efficiency investments.

The instrument targets projects which support the implementation of National Energy Efficiency Action Plans or other energy efficiency programs of EU Member States.

The PF4EE instrument's two core objectives are:

- to make energy efficiency lending a more sustainable activity within European financial institutions, considering the energy efficiency sector as a distinct market segment
- to increase the availability of debt financing to eligible energy efficiency investments

The instrument is managed by the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme). The LIFE Programme committed EUR 80m to fund the credit risk protection and expert support services. The EIB will leverage this amount, making a minimum of EUR 480m available in long term financing.

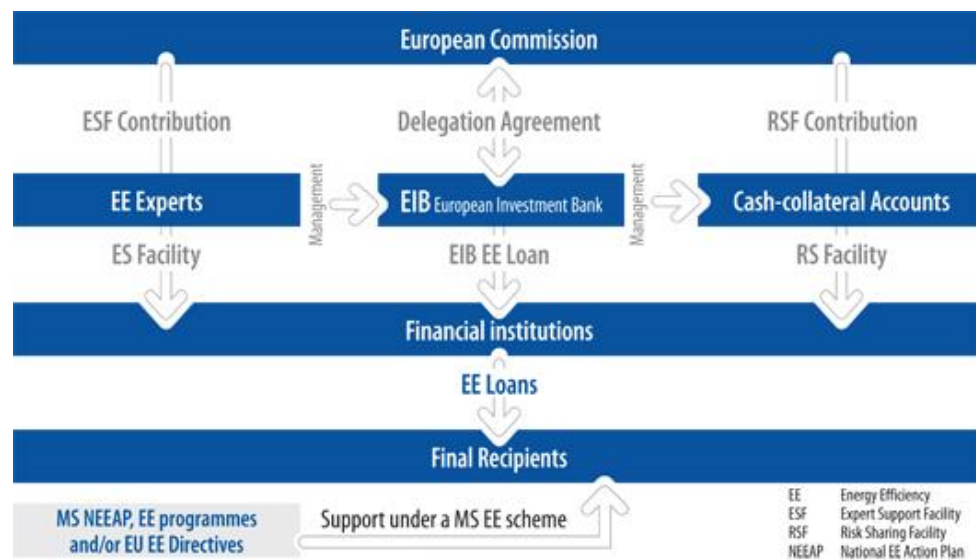
The instrument, where it is activated, is implemented by a **Financial Intermediary**. The Financial Intermediary is a financial institution who has been selected to participate in the implementation of PF4EE Instrument in accordance with the terms of the "Request for Proposals"<sup>58</sup> and with which EIB has entered into one or more legally binding agreements.

**Final recipients** benefitting from the PF4EE Instrument should be defined in the context of the relevant Participating Countries' NEEAP. They may include natural persons, home-owner associations, enterprises, public institutions/bodies and any other entities undertaking Eligible EE Investments<sup>59</sup>.

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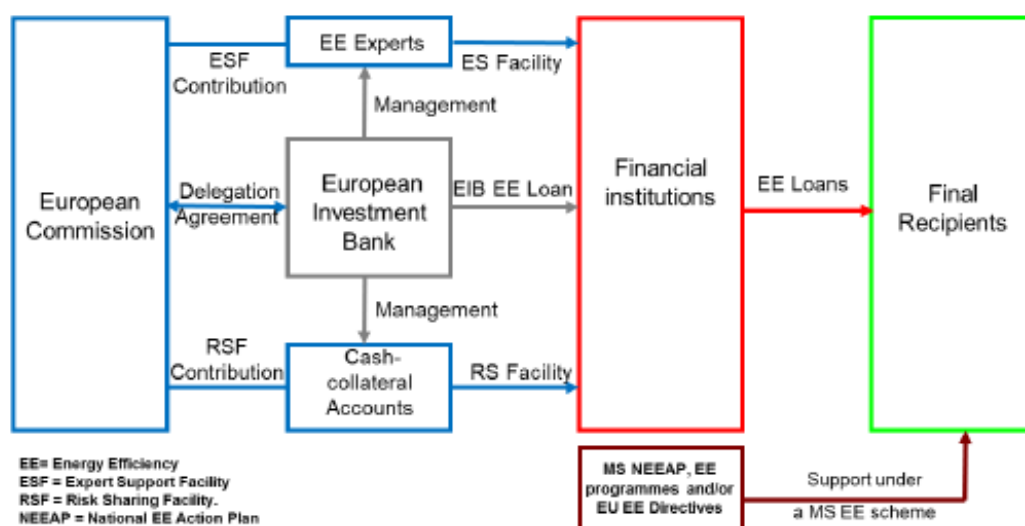
<sup>58</sup> "Request for proposals in order to become a Financial Intermediary under the PF4EE" - [http://www.eib.org/attachments/documents/pf4ee\\_request\\_for\\_proposals\\_en.pdf](http://www.eib.org/attachments/documents/pf4ee_request_for_proposals_en.pdf)

<sup>59</sup> See pag. 24 of the document "Request for proposals in order to become a Financial Intermediary under the PF4EE"


FIGURE 21. PF4EE FUNCTION<sup>60</sup>

The PF4EE instrument will provide:

- a portfolio-based credit risk protection provided by means of cash-collateral (Risk Sharing Facility - RSF)
- long-term financing from the EIB (EIB Loan for Energy Efficiency ) at competitive rates
- expert support services for the Financial Intermediaries (Expert Support Facility - ESF)


FIGURE 22. PF4EE FUNCTION<sup>61</sup>

<sup>60</sup> Source: European Investment Bank

PF4EE is now available only in Spain, Czech Republic and France.

As of 31 December 2015, the instrument supported three financial intermediaries with Risk Sharing Facilities and Expert Support Facilities for a total amount of €14 mln.

The Spain experience<sup>62</sup> regarding energy efficiency in the hotel sector showed how this instrument combines three elements:

- The first is an EIB loan to improve the funding conditions of the energy efficiency investments financed by Santander.
- The second component partially covers potential losses by that Santander may incur as a result of the abovementioned energy efficiency loans.
- The third element will strengthen the lending capacity to energy efficiency investments of Santander by passing on technical and financial experience gained from similar schemes elsewhere in Europe.

If a Municipality or a Final Recipient would consider this Programme, it should verify that:

- Is the PF4EE activated?
- Who is the Financial Intermediaries for the implementation of the instrument?
- Is the Project to candidate eligible?
- What are the steps defined by the Financial Intermediaries to start a selection procedure?

TYPE	BENEFICIARIES	COUNTRIES <sup>63</sup>	BUDGET
Favourable loans and guarantees	Local authorities, SMEs, ESCOs, Utilities	ES, CZ, FR	€ 480 mln

**TABLE 9. MAIN CHARACTERISTICS OF PF4EE**

Reference: <http://www.eib.org/pf4ee>

<sup>61</sup> "Request for proposals in order to become a Financial Intermediary under the PF4EE" – document published on 19/01/2015

<sup>62</sup> The European Investment Bank and Banco Santander signed an agreement worth EUR 50 million under the Private Finance for Energy Efficiency initiative, a new European scheme to increase and improve financing conditions to private sector investments in reducing energy use in Spain. <http://www.eib.org/infocentre/press/releases/all/2015/2015-300-eib-banco-santander-agreement-to-finance-investments-in-energy-efficiency-in-the-hotel-sector.htm>

<sup>63</sup> It is possible to activate the PF4EE in every Participating Country (Member State of European Union)

## EUROPEAN STRUCTURAL AND INVESTMENT FUNDS (ESIF) – FORMER JESSICA

Financial Instruments (FIs) transform EU resources under the European Structural and Investment Funds (ESIF) into financial products such as loans, guarantees, equity and other risk-bearing mechanisms. These are then used to support economically viable projects which promote EU policy objectives.

FIs aim to put EU funds to good and efficient use, ensuring that grants are complemented by other financial products so that EU funding can be used time and time again in a revolving fashion. FIs can be combined with technical support or guarantee/interest rate subsidies.

An example of the type of Financial Instrument that could be developed is the Urban Development Fund (UDF). The UDF can invest in public-private partnerships and other integrated projects for sustainable urban development. In the 2007-2013 programming period, many projects were financed by UDFs under the JESSICA program. The main benefits of JESSICA are:

- To make Structural Fund support more efficient and effective by using “non-grant” financial instruments, thus creating stronger incentives for successful project implementation;
- To mobilise additional financial resources for public-private partnerships and other urban development projects with a focus on sustainability/recyclability;
- To use financial and managerial expertise from international financial institutions such as the EIB;
- To encourage the development of the projects through the support of the financial institution dedicated to the implementation of the instrument.

TYPE	BENEFICIARIES	COUNTRIES	BUDGET
Mainly loans but also semi-equity and guarantees	Mainly Public Authorities	Depends on operational program	Depends on operational program

**TABLE 10. MAIN CHARACTERISTICS OF ESIF**

Reference: <http://www.eib.org/products/blending/esif/index.htm>

## EUROPEAN INVESTMENT BANK (EIB): INTERMEDIATED LOANS

Intermediated loans are provided by the European Investment Bank to local banks. These loans can only be provided for certain purposes. Improving environmental sustainability of SMEs is one of these conditions, which includes supporting competitive and secure energy supply.

The final beneficiaries can be:

- Small-and-medium-sized businesses

- Mid-Cap businesses
- Large businesses
- Local authorities
- National administrations
- Public sector bodies

All intermediated loans must further at least one of our public policy goals:

- Increase in growth and employment potential – including SME and Mid-Cap support
- Economic and social cohesion by addressing economic and social imbalances, promoting the knowledge economy/skills and innovation and linking regional and national transport infrastructure
- Environmental sustainability - including supporting competitive and secure energy supply
- Action for climate-resilient growth

Loan conditions can be flexible in terms of the size, duration, structure etc.

The intermediary must transfer a financial advantage reflecting the impact of BEI funding.

TYPE	BENEFICIARIES	COUNTRIES	BUDGET
Favourable loans	Municipalities	EU Members	Ongoing

**TABLE 11. MAIN CHARACTERISTICS OF INTERMEDIATED LOANS OF EUROPEAN INVESTMENT BANK (EIB)**

## EUROPEAN FUND FOR STRATEGIC INVESTMENT (EFSI)

EFSI is an initiative launched jointly by the EIB Group - European Investment Bank and European Investment Fund - and the European Commission to help overcome the current investment gap in the EU by mobilising private financing for strategic investments.

EFSI is a EUR 16 billion guarantee from the EU budget, complemented by a EUR 5 billion allocation of the EIB's own capital.

With EFSI support, the EIB Group will provide funding for economically viable projects where it adds value, including projects with a higher risk profile than ordinary EIB activities. It will focus on sectors of key importance where the EIB Group has proven expertise and the capacity to deliver a positive impact on the European economy, including:

- Strategic infrastructure including digital, transport and energy
- Education, research, development and innovation
- Expansion of renewable energy and resource efficiency
- Support for smaller businesses and midcap companies

As of 16 June 2016, EFSI approved 266 transactions for a total €17,7 bln, of which 22% in Energy sector.

TYPE	BENEFICIARIES	COUNTRIES	BUDGET
Favourable loans and guarantees	Public and private sector	EU 28	€ 16 bln as guarantee € 5 bln as capital

TABLE 12. MAIN CHARACTERISTICS OF EUROPEAN FUND FOR STRATEGIC INVESTMENT (EFSI)

Reference: <http://www.eib.org/efsi/>

### 3.4.2. CASE STUDIES

In this section, we present three case studies, focusing on Subsidizing Funds operating in the energy efficiency sector with different dynamics.

#### JESSICA PROGRAM

JESSICA (Joint European Support for Sustainable Investment in City Areas) is an initiative of the EC, developed jointly with the EIB and in collaboration with the Council of Europe development bank (CEB). It aims to promote **sustainable investment, growth and jobs in urban areas in the EU**. The initiative addresses urban regeneration and investment needs, including projects in energy efficiency and renewable energies in cities.

JESSICA was a mechanism foreseen in the EU Regulations for the revolving use of 2007/2013 EU Funds (in particular European Regional Development Fund) that Regions and Member States usually invest in social initiatives via public grants. The investment strategy of JESSICA Funds are therefore linked to prescriptions of ERDF Operational Programs to whom JESSICA resources come from.

JESSICA was implemented in several European Regions and Member States, with different configurations, but the main scheme, as reported in the figure below, foresees:

- The Regional **Managing Authority (MA)**, that is the first responsible of ERDF resources
- The **Holding Fund** (usually the EIB), acting as intermediary of the MA and as its advisor for the definition of the JESSICA strategy and for its monitoring;
- The **Urban Development Fund**, selected by the Holding Fund and responsible for the investment of managed resources in projects;
- **Projects** receiving JESSICA resources, usually represented by PPP project vehicles

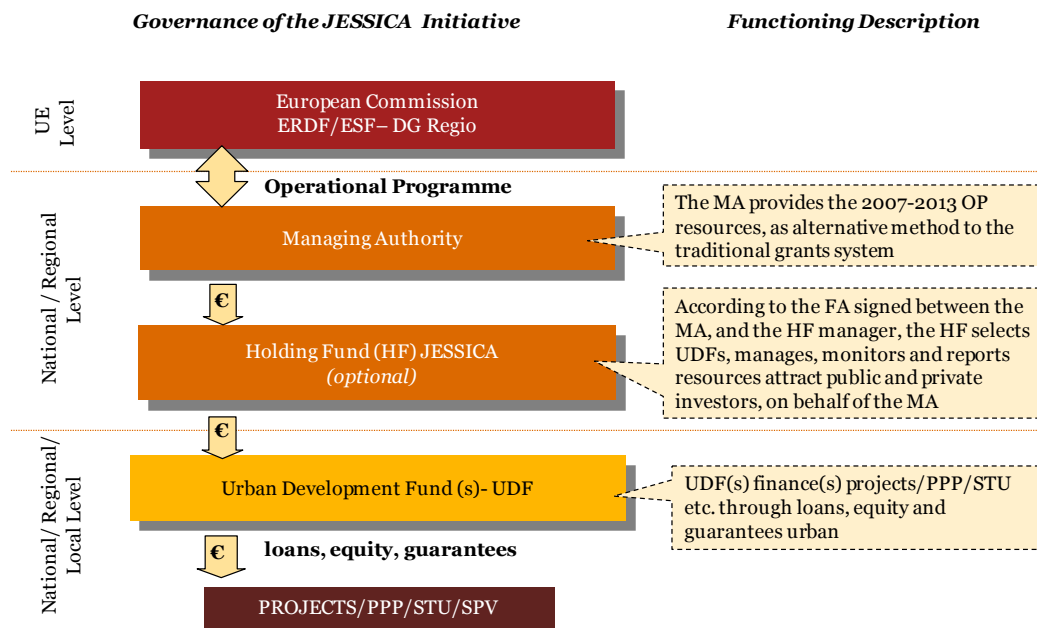


FIGURE 23. REPRESENTATION OF JESSICA MECHANISM

## JESSICA ENERGY EFFICIENCY FOR SICILY

JESSICA energy efficiency fund for Sicily was provided with 53 million Euros (FESR funds) to be invested in energy efficiency and renewable energy projects within the Region. Moreover, the consortium selected by the EIB for the management of the fund (composed by a national bank and two technical and financial advisors) have committed to co-finance EE/RE project with bank resources.

JESSICA Fund in Sicily offered, after some evaluation procedures and in accordance with the rules<sup>64</sup>, lending to Municipalities or to ESCOs/other enterprises at low interest rates. The activation of JESSICA Funds is subject to the commitment of a co-financing (bank and private resources) at least of 30%.

Some characteristic of JESSICA Sicily Fund<sup>65</sup>:



- medium-long term loan / mortgage assisted where necessary by guarantees, to be assessed from time to time and in any case in maximum extent of 70% of the cost of eligible project;
- Provision in one or more state solutions Work Status (SAL)
- Fixed interest rate, in compliance with the rules on state aid

The following table reports a brief summary of two projects financed by the JESSICA fund in the energy efficiency sector.

<sup>64</sup> Such as "State Aid Rule"

<sup>65</sup> Reference: [http://www.iccreabancaimpresa.it/doc/default.asp?i\\_menuID=4963&i\\_cartellaID=32810](http://www.iccreabancaimpresa.it/doc/default.asp?i_menuID=4963&i_cartellaID=32810)



<b>Sector Project</b>	<b>JESSICA SICILY – TRAPANI</b>	<b>JESSICA SICILY – RIBERA</b>
	Energy Efficiency in Public Lighting Concession for the engineering, construction and operation of the public lighting plants	Energy Efficiency in Public Lighting Concession for the engineering, construction and operation of the public lighting plants
<b>Localization</b>	Municipality of Trapani, Sicily 	Municipality of Ribera, Sicily 
<b>Type investment</b>	of The intervention is focused on the renovation of the whole public lighting system, thus including the replacement of old lamps with new LED lamps and the installation of remote control systems	The intervention is focused on the renovation of the whole public lighting system, thus including the replacement of old lamps with new LED lamps and the installation of remote control systems
<b>JESSICA Funds</b>	JESSICA funds: 2,2 mln Euros (70% of the entire Investment)	JESSICA funds: 1,0 mln Euros (70% of the entire Investments)
<b>Beneficiary</b>	ESCo	ESCo

As anticipated in previous pages, in this section we will focus on two JESSICA experiences, reported in the following table.

	JESSICA EE IN ESTONIA	JESSICA EE IN LITHUANIA
Public Resources	49 mln €( + 15% self- financing, total 57 mln €)	227 mln €
Holding Fund	EIB	EIB
Urban	▪ ERDF	▪ 6.000.000,00 € to Šiauliai bank (I JESSICA Call 2010);
Development	▪ CEB	▪ 6.000.000,00 € to Swedbank (I JESSICA Call 2011);
Fund (UDF)	▪ KredEx	▪ 6.000.000,00 € to SEB bank (I JESSICA Call 2012);
		▪ 10.000.000,00 € to Šiauliai bank (II JESSICA Call 2011);
		▪ 20.000.000,00 € undergoing III JESSICA Call 2012
UDF Co-financing	n/d	n/d
Project Typology	The aim is to support the renovation of apartment buildings and to raise their energy efficiency at least by 20%, by improving the accessibility of loan capital through KredEx45. Favorable conditions arise from the combination of zero interest means with outside financing. Long time low interest loans are offered for apartment buildings to achieve energy efficiency47. Fixed interest for 10 years, interest rate between 3.7% - 4.2%. Maturity up to 20 years. Start: 24.06.2009	Modernization of multi-family buildings: Heating and hot water system upgrading; replacement of windows and exterior doors; roof insulation; wall insulation; basement ceiling insulation; insulation of base; drinking water pipelines and equipment replacement; repair works of sewage system; floor insulation on the ground; electrical wiring repair works; stairwell repair works
Invested resources	n/d	385.319,16 €
Municipality	n/d	Plungė
Main results and evidences	<ul style="list-style-type: none"> <li>▪ Average energy savings: 33%</li> <li>▪ Total amount lent: 10.2 million (by 31.07.2010)</li> <li>▪ Average cost for building refurbishment: EUR 76,600</li> <li>▪ N° of multi-apartment buildings refurbished: 122 (July 2010)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Energy efficiency class (according to Energy Performance Certification classification) before refurbishment (modernisation): <b>E</b></li> <li>▪ planned value: <b>C</b></li> <li>▪ Achieved value: <b>B</b></li> <li>▪ Energy consumption before modernisation: <b>293,94 kWh/m<sup>2</sup></b></li> <li>▪ Energy consumption after modernisation: <b>121,01 kWh/m<sup>2</sup></b></li> <li>▪ Energy savings: <b>58,83 %</b></li> </ul>

### 3.4.3. ADVANTAGES, DISADVANTAGES AND OTHER CONSIDERATIONS ABOUT THIS KIND OF FINANCIAL INSTRUMENT

nZEB projects usually show long pay-back times and low financial sustainability. In addition, Municipality are often unable to provide the project with the amount of finance required and ESCOs are not interested in such projects if these don't offer a proper return on investment. Thus, the availability of subsidized funds could help the Municipality or the ESCo to reduce the cost of capital and improve the sustainability of the project.

Subsidised funds, delivered in the form of low or zero interest loans are very useful financial instruments for nZEB projects. As shown in D2.5, most of nZEB projects need financial aid to be attractive for ESCOs and to activate private investments.

European and National/Regional institution are aware of this and thus offer the market proper financial instruments. In facts, many projects in the energy efficiency sector were financed by the JESSICA program with low or zero-interest loans. JESSICA, joint with co-financing and investment from the private sector, is an adequate instrument to increase the feasibility of nZEB projects. In addition, as a difference from grants, the revolving nature of the instruments allows the financier to recover financial resources invested and reinvest them in new projects.

In the end, subsidized funds are useful because:

- They provide the Municipalities with some liquidity to make investments;
- They help ESCOs to reduce the cost of capital, thus reducing pay-back time and increasing return on investment;
- They may activate co-funding and private investments;
- Their revolving nature allow promoters to reinvest the financial resources in new projects.
- Provided that the right conditions are present, these mechanisms are not particularly difficult to administer.

On the other side, subsidized funds may bear some disadvantage, because:

- They may be not sufficient to ensure financial sustainability to projects;
- Energy savings may not always be considered as a cash flow by some financial intermediaries
- Projects may comply with strict features to be eligible for subsidized funds.

Other case studies:

COVERAGE	PROGRAM	PROGRAM BRIEF DESCRIPTION
National (EU – Ireland)	National Energy Efficiency Fund	The Ireland Government has invested in a €70 million National Energy Efficiency Fund with Sustainable Development Capital LLP (SDCL) acting as investment advisor
National (EU – Estonia)	Estonian fund energy efficient	Estonian fund energy efficient is a fund created by the union of EU Structural Funds and the funds from CEB addressed to the housing refurbishment. It offer a long time low interest loan both to support the renovation of apartment buildings and to raise their energy efficiency at least by 20%, therefore improving the accessibility at loan capital <a href="http://www.urbenergy.eu/105.0.html?&amp;L=1">http://www.urbenergy.eu/105.0.html?&amp;L=1</a>

COVERAGE	PROGRAM	PROGRAM BRIEF DESCRIPTION
National (EU - Bulgaria)	Bulgarian Energy Efficiency Fund	The Fund is backed by the World Bank, GEF, and governments of Austria and Bulgaria. It supports the identification, development and financing of viable EE projects, resulting in substantial reduction of GHGs. The Fund finances via: Debt Financing Facility; Partial Credit Guarantees.
National (EU - UK)	Salix Finance	Salix Finance Limited was established in 2004 backed by the U.K. Dept of Energy and Climate Change as a publicly funded organization dedicated to providing the public sector. The Fund lend loans for EE projects to reduce energy consumption and costs by replacing dated, inefficient technologies with modern, energy efficient technologies.
National (EU - Spain)	JESSICA EE Spain (F.I.D.A.E.)	It is a fund allocated with nearly M€123, whose aim is to finance urban sustainable development projects to improve energy efficiency, use renewable energies and be developed by energy services companies (ESCOs) or other private enterprises. It is a Fund co-funded by FEDER and IDAE and operated by the European Investment Bank (EIB). This fund is to finance all the investments directly bound to the issue of energy efficiency, and it is compatible with other public or private funding sources, as well as with subsidies either co-funded or not by the FEDER.
Regional (Italy – Sardinia)	JESSICA Energy Efficiency for Sardinia	ERDF funds allocated to "JESSICA Urban Development" of about 130 million Euro, of which 33 million Euro of ERDF funds. The project is commissioned by the EIB
Regional (Italy – Campania)	JESSICA Energy Efficiency Campania	ERDF Funds for "Campany JESSICA " for about 110 mln Euro of which 31,7 mln Euro for ERDF Funds and. The project is commissioned by the EIB
Local (UK - London)	JESSICA London Green Fund	The London Green Fund (LGF) is a £100 million fund set up to invest in schemes that will cut London's carbon emission. The fund was launched in October 2009 and is managed by the European Investment Bank on behalf of the GLA and LWARB. The LGF provides funding for direct investments in waste, energy efficiency, decentralized energy and social housing projects. They are 'revolving' investment because money invested in one project, once repaid, are then reinvested in other projects.

TABLE 13. CASE STUDIES OF NATIONAL AND REGIONAL SUBSIDIED FUNDS

### 3.5. GRANT

#### 3.5.1. GENERAL DESCRIPTION

Grants are a type of financial aid that does not have to be repaid. Generally, Grants are provided to projects that are not marketable, which means they can't be financed under normal market conditions, for example using a bank loan.

**Definition of Grants:** “direct contributions, by way of donation, from the budget in order to finance either an action intended to help achieve an objective part of the EU policy or the functioning of a body which pursues an aim of general European interest or has an objective forming part of a EU policy<sup>66</sup>”

For financing nZEB retrofitting, the grant maker is usually the general government, different managing authorities representing the European Union or other organizations. Municipalities could be beneficiaries of grants for nZEB retrofitting.

The common procedure is that grant maker provides a request of proposals with the specific targets of the call and requirements of the funder(s). The potential beneficiaries set up a proposal that is expected to fit into the requirements of the call (request of proposals). Following the grant maker assess and evaluate the proposals in order to choose those, if any that satisfy its expectations and desires.

#### 3.5.2. MAIN EUROPEAN GRANT FUNDS

The main European Grant Funds available in the market are given to the table below. The Grants could be used to finance the construction, renovation, design studies and even the communication activities.

A brief description of the main Grand funds is given to the next paragraph.

Name of fund	Promoter	Manager	Country availability	of Budget	Suitability for nZeb
<b>ELENA (technical assistance)</b>	EE	EIB	ES, GR, IT, PT, (*) <sup>67</sup>		Low (technical assistance)
<b>IEE</b>	EE		ES, GR, IT, PT,		Medium
<b>INTERREG (2014 -2020)</b>	EE	ERDF	ES, GR, IT, PT,	m€359	Medium
<b>HORIZON 2020 (capacity building)</b>	EE	EASME	ES, GR, IT, PT,	m€70	Low
<b>Urbact III (communication)</b>	EE	ERDF Member States City and region members	ES, GR, IT, PT,	m€96.3	Low

<sup>66</sup> Glossary of the European Commission on financial programming and budget, [http://ec.europa.eu/budget/explained/glossary/glossary\\_en.cfm#g](http://ec.europa.eu/budget/explained/glossary/glossary_en.cfm#g)

<sup>67</sup> (\*) EU Member state, Norway, Iceland, Liechtenstein, Croatia and FYR Macedonia

Name of fund	Promoter	Manager	Country availability	of Budget	Suitability for nZeb
UIA LIFE+ The EEA Grants and Norway Grants	EE		ES, GR, IT, PT,	m€372	Strong
	EE		ES, GR, IT, PT, (*)	m€3,460	Low
	Iceland, Liechtenstein and Norway	EEA	ES, GR, PT	m€856	Medium

TABLE 14. MAIN CHARACTERISTICS OF EUROPEAN GRANT FUNDS

### 3.5.2.1 BRIEF DESCRIPTION OF MAIN EUROPEAN GRANT FUNDS

#### European Local Energy Assistance (ELENA)

ELENA<sup>68</sup> (European Local Energy Assistance) covers up to 90% of the technical support cost needed to prepare, implement and finance the energy efficiency investment program.

This could include activities like feasibility and market studies, program structuring, energy audits and tendering procedure preparation.

With solid business and technical plans in place, this will also help attract funding from private banks and other sources, including the EIB.

So whether it is the retrofitting of public and private buildings, sustainable building, energy-efficient district heating and cooling networks, environmentally-friendly transport etc, ELENA helps local authorities get their projects on the right track. The principal characteristics of the ELENA program are shown in the following table.

Reference: [ELENA](#)

<sup>68</sup> [http://www.eib.org/attachments/thematic/elena\\_en.pdf](http://www.eib.org/attachments/thematic/elena_en.pdf), [http://www.eib.org/attachments/documents/elena\\_faq\\_en.pdf](http://www.eib.org/attachments/documents/elena_faq_en.pdf)

Typology	
Technical Assistance facility	
<b>Objective</b>	Simplify the procedures on renewable energy and energy efficiency investments at local level and promoting production from renewable resources and energy efficiency investments at a local level
<b>Sector</b>	<ul style="list-style-type: none"> <li>Renewable energy and energy efficiency in public and private buildings</li> <li>Public lightning</li> <li>Urban transport</li> <li>Local infrastructure, smart grid, ICT</li> </ul>
<b>Beneficiaries</b>	Local or/and regional entities, group of EU public entities
<b>Maximum coverage</b>	90% of the expenditure for technical assistance
<b>Eligible expenditures</b>	<ul style="list-style-type: none"> <li>Expenditures to technical assistance for investments in energetic sector at city and/or regional level ( keep out hardware expenditures)</li> <li>feasibility study</li> <li>Business Plan</li> <li>Energy audit</li> </ul>
<b>Eligible criteria</b>	<ul style="list-style-type: none"> <li>Total project investment: 30 mln€</li> <li>Leverage index &gt;20 ( total investment/ technical expenditures&gt;20)</li> <li>Project maturity &lt; 3 years</li> </ul> Project regarding UE 20/20
<b>Note</b>	If the project planned is not realized it is required grants repayments

TABLE 15. MAIN CHARACTERISTICS OF ELENA

## HORIZON 2020

Horizon 2020<sup>69</sup> is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. One of the challenges which Horizon 2020 will address is secure, clean and efficient energy.

<sup>69</sup> [http://ec.europa.eu/newsroom/horizon2020/document.cfm?doc\\_id=4752](http://ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=4752)

Horizon 2020 provide financing support to activities related to energy-efficient buildings, industry, heating and cooling, SMEs and energy-related products and services, as well as for improving the attractiveness of energy-efficiency investments.

Reference: [HORIZON 2020](#)

## PROJECT DEVELOPMENT ASSISTANCE (PDA)

Within the framework of the EU's Research and Innovation Program, Horizon 2020, the European Commission defined, in continuity with the Intelligent Energy Europe (IEE) program, the Project Development Assistance (hereinafter referred to as PDA) to bridge the gap between the design phase and construction phase for energy sustainability sector.

The major objective of the Project Development Assistance (PDA) topic is to demonstrate the financial viability and sustainability of large-scale sustainable energy investment projects, providing the market with tangible showcases that should trigger further replication.

The aim is to build technical, economic and legal expertise needed for the project development and leading to the launch of concrete sustainable energy investments. Every million Euro of Horizon 2020 support should trigger investments worth at least EUR 15 million ("leverage").

The Commission considers that the proposals for an EU contribution between 0.5 and 1.5 million euro will allow to adequately address this specific challenge. However, this does not preclude the submission and selection of proposals that require other sums.

PDA focusses on the following sectors:

- existing public and private buildings;
- street lighting;
- retrofitting of existing district heating/cooling;
- energy efficiency in urban transport (such as transport fleets, the logistics chain, mobility, modal change and shift) in urban/sub-urban agglomerations and other densely populated areas and energy efficiency in industry and services.

The main features should be summarized as follows:

- The proposed investments will be launched before the end of the action which means that projects should result in signed contracts (or launched tendering procedures as appropriate) for sustainable energy investments to that effect, e.g. construction works, energy performance contracts, turnkey contracts.
- Whilst proposals may address investments into distributed, small-scale renewable energy sources in combination with energy efficiency, the main focus should lie on capturing untapped high energy efficiency potentials.



- 
- Proposals should have an exemplary/showcase dimension in their ambition to reduce energy consumption and/or in the size of the expected investments.
  - Proposals should also deliver organisational innovation in the financial engineering (e.g. on-bill financing schemes, guarantee funds, or factoring funds) and/or in the mobilisation of the investment programme (e.g. bundling, pooling or stakeholder engagement).
  - Innovation should be demonstrated taking into account the state-of-the-art.
  - In addition, proposals should demonstrate a high degree of replicability and include a clear action plan to communicate experiences and results towards potential replicators across the EU.

So far, the PDA has funded 28 projects for a total of 680 million euros<sup>70</sup>. For a detail of the projects, a document is available the commission site<sup>71</sup>

Reference: <https://ec.europa.eu/easme/en/project-development-assistance-pda>

## INTELLIGENT ENERGY EUROPE (IEE)

Intelligent Energy Europe programmes<sup>72</sup> are not any more available, even there is still some project on going. IEE programmes aimed at helping organisations willing to improve energy sustainability, either by providing financing for studies or/and demonstration activities. Launched in 2003 by the European Commission, the programme was part of a broad push to create an energy-intelligent future for us all. It supported EU energy efficiency and renewable energy policies, with a view to reaching the EU 2020 targets (20% cut in greenhouse gas emissions, 20% improvement in energy efficiency and 20% of renewables in EU energy consumption). Municipalities were potential beneficiaries.

Intelligent Energy – Europe (IEE) is **now closed**, although a number of projects funded under the programme will continue to run until 2017<sup>73</sup>. The EU's Horizon 2020 programme now supports the research, demonstration and market up-take of energy-efficient technologies.

Reference: [Intelligent Energy Europe \(IEE\)](#)

## INTERREG (2014 -2020)

The INTERREG EUROPE Programme is an EU programme that helps regions across Europe to work together, sharing their knowledge and experience<sup>74</sup>.

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<sup>70</sup> [https://ec.europa.eu/easme/sites/easme-site/files/all\\_presentations\\_pda\\_session\\_h2020\\_ee\\_info\\_day\\_2016.pdf](https://ec.europa.eu/easme/sites/easme-site/files/all_presentations_pda_session_h2020_ee_info_day_2016.pdf)

<sup>71</sup> [https://ec.europa.eu/easme/sites/easme-site/files/20160805\\_mlei\\_projects-factsheets\\_final.pdf](https://ec.europa.eu/easme/sites/easme-site/files/20160805_mlei_projects-factsheets_final.pdf)

<sup>72</sup> <http://ec.europa.eu/energy/intelligent/>

<sup>73</sup> <http://ec.europa.eu/easme/en/intelligent-energy-europe>

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INTERREG aims to the support of the overall economic development and to the reduction of differences between regions in terms of wealth, income and opportunities. Concretely, the programme focus on improving regional and local policies in two areas:

- Innovation and the knowledge economy
- Environment and risk prevention

Reference: [INTERREG IVC](#)

## LIFE+ Programme

“LIFE is the EU’s financial instrument supporting environmental, nature conservation and climate action projects throughout the EU. Since 1992, LIFE has co-financed some 4306 projects. For the 2014-2020 funding period, LIFE will contribute approximately €3.4 billion to the protection of the environment and climate<sup>75</sup>”.

The LIFE programme covers three priority areas: environment and resource efficiency; nature and biodiversity; and environmental governance and information. The programme also supports jointly funded integrated projects, which will operate on a large territorial scale. These projects aim to implement environmental and climate policy and to better integrate such policy aims into other policy areas.

Reference: [LIFE](#)

## Urbact

URBACT’s mission is to enable cities to work together and develop integrated solutions to common urban challenges, by networking, learning from one another’s experiences, drawing lessons and identifying good practices to improve urban policies. It is an instrument of the Cohesion Policy, co-financed by the European Regional Development Fund, the 28 Member States, Norway & Switzerland.

Even the Programme is not appropriate for financing the retrofitting of the building itself, it can be used to finance relevant actions

Reference: [Urbact](#)

## Urban Innovative Actions (UIA)

*“Urban Innovative Actions (UIA) is an Initiative of the European Commission that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.*

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<sup>74</sup> [http://www.interreg4c.eu/fileadmin/User\\_Upload/PDFs/INTERREG\\_EUROPE\\_01.pdf](http://www.interreg4c.eu/fileadmin/User_Upload/PDFs/INTERREG_EUROPE_01.pdf)

<sup>75</sup> <http://ec.europa.eu/environment/life/about/index.htm#life2014>

*The main objective of UIA is to provide urban areas throughout Europe with resources to test innovative solutions to the main urban challenges, and see how these work in practice and respond to the complexity of real life<sup>76</sup>.*

Reference: [Urban Innovative Actions \(UIA\)](#)

## The EEA Grants and Norway Grants

The EEA Grants and Norway Grants represent the contribution of Iceland, Liechtenstein and Norway to reducing economic and social disparities and to strengthening bilateral relations with 16 EU countries in Central and Southern Europe and the Baltics. “Each beneficiary country agrees on a set of programmes with the donor countries, based on national needs and priorities and the scope for cooperation with the donor countries. All programmes must adhere to standards relating to human rights, good governance, sustainable development and gender equality<sup>77</sup>”. Italy is not between the beneficiary countries<sup>78</sup>.

Reference: [The EEA and Norway Grants](#)

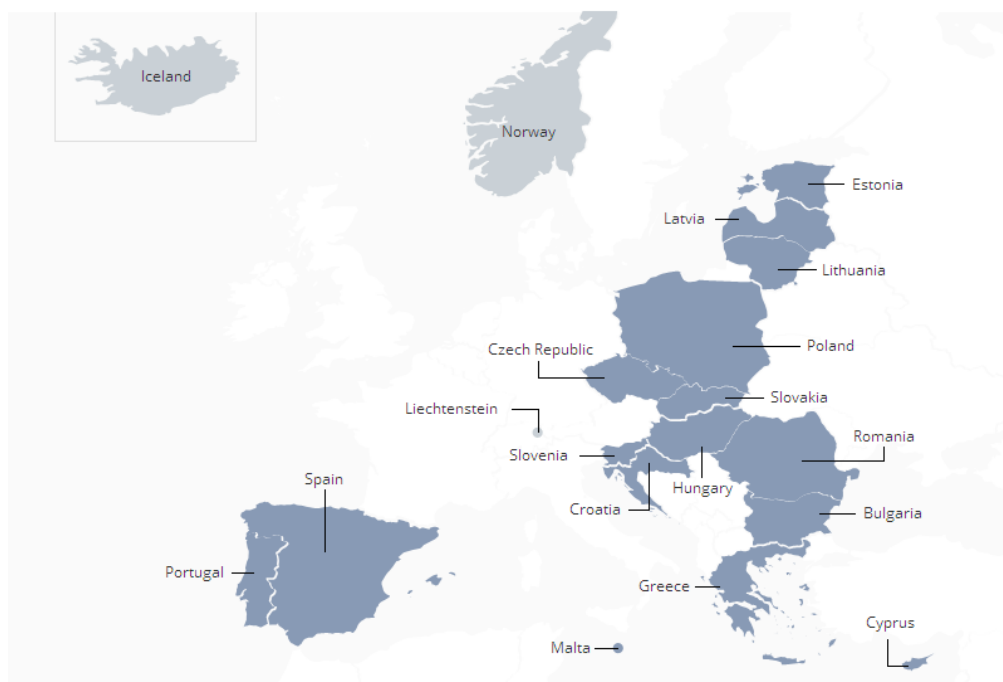


FIGURE 24. BENEFICIARY COUNTRIES (SOURCE: <http://eeagrants.org/>)

<sup>76</sup> <http://www.uia-initiative.eu/en/about-us/what-urban-innovative-actions>

<sup>77</sup> <http://eeagrants.org/Who-we-are>

<sup>78</sup> <http://eeagrants.org/Where-we-work>

### 3.5.3. ADVANTAGES, DISADVANTAGES AND OTHER CONSIDERATIONS

As it has been already noticed, Grants are highly desirable from the building owners, but it is supposed that they can rarely support to financial sustainability, as they have zero revolving effect. Even so, Grants could be very useful in order to make some projects market attractive. In the case of energy efficiency projects, they are used Actions Grants to *“finance actions to help achieving an objective part of a Union policy”*<sup>79</sup>. Grants could also be very useful for financing projects that incorporate technologies are pre-commercial or in the early stages of commercial deployment or are otherwise prohibitively expensive<sup>80</sup>.

The clear advantages of using Grants for financing, are:

- projects could potentially increase their market attractiveness,
- the combination of Grants with other instruments<sup>81</sup>, such as bank loans, could provide a better solution that fulfills the expectations and needs of the building owners,
- they could be particularly suitable for economically depressed areas, immature or financially constrained markets,
- they could be particularly helpful for proof of concept and demonstration activities and to encourage uptake of innovative or beyond cost-optimal measures.

The disadvantages of Grants' project financing are:

- they offer low replicability as Grants' funds are limited,
- they have almost zero revolving effect, meaning that once the money given as a Grant they will be not returned to the donor in order to be used for another project,
- usually they are given through a time consuming and demanding procedure (competition), in terms of required technical capabilities and cost.

Concluding, it has to be emphasized that Grants are very important in order to support actions that they are not financial viable under market conditions and once they used in combination with other financing tools that may trigger the market.

### 3.5.4. MAIN NATIONAL AND REGIONAL GRANT FUNDS AVAILABLE

SUMMARY TABLE: MAIN FEATURES OF GRANTS (EXAMPLE)

Country/Region	Promoter	Manager	Beneficiary	Budget	Investment size	Suitability for nZeb
Spain	Ministry of Industry, Energy and Tourism	IDAE	All building owners	€200 million		Medium

<sup>79</sup> “Financial Instruments 2014-2020 under European Structural and Investment Funds (ESIF)”, Symela Tsakiri, Brussels, 19-20 January 2015

<sup>80</sup> [http://ec.europa.eu/regional\\_policy/sources/docgener/studies/pdf/financing\\_energy\\_renovation.pdf](http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/financing_energy_renovation.pdf)

<sup>81</sup> “Grants and financial instruments working together”, FI-COMPASS (<https://www.fi-compass.eu>)

Country/Region	Promoter	Manager	Beneficiary	Budget	Investment size	Suitability for nZeb
Spain	Action Plan on Energy Efficiency and Saving	IDAE	“Energy consuming centres”	€2,350 million		Low
Italy / Campania	Campania Region	Campania Region	Municipalities, local health authorities, hospitals, water management bodies	€115 million		Low
Italy / Lazio	Lazio Region	Lazio Region	Public buildings	€25 million		Medium
Italy / Bolzano	Autonomous Province of Bolzano	Autonomous Province of Bolzano	Residential buildings		> € 4000	Low
Italy / Piedmont	Piedmont Region	Piedmont Region	Public and residential buildings	€5 million		Low
Italy / Umbria	Umbria Region	Umbria Region	“Regional-interest buildings”	€2 million		Medium
Greece	Ministry of Environment and Energy	EPPERAA	Public school buildings	€40 million		Medium
Greece	Ministry of Environment and Energy	EPPERAA	Public buildings	€175 million <sup>82</sup>		Medium

**TABLE 16. MAIN CHARACTERISTICS OF MAIN NATIONAL AND REGIONAL GRANT FUNDS**

#### 3.5.4.1 SPAIN: PAREER-CRECE PROGRAMME

*“Promoting energy conservation, energy efficiency measures and the use of renewable energy”*

The Ministry of Industry, Energy and Tourism through the Institute for Energy Diversification and Saving (IDAE) launched a specific aid and financing program amounting to M€200 so as to encourage and promote the implementation of reform measures enhancing energy conservation, improving energy efficiency, the use of renewable energy and reducing carbon dioxide emissions in existing buildings, regardless of their use and the legal nature of the owners; and also to help achieve the objectives set out in Directive 2012/27/EU on energy efficiency, and in Action Plan 2014-2020.

The actions are to fit one or more of the following typologies:

1. Improvement of the thermal envelope energy efficiency.
2. Improvement of energy efficiency in thermal and lighting installations.

<sup>82</sup> <http://www.pireasnet.gr/LinkClick.aspx?fileticket=TL8X0PiEt9w%3D&tabid=1283>

3. Replacement of conventional energy for biomass in thermal installations.
4. Replacement of conventional energy with geothermal energy in thermal installations.

The actions subject of this aids are to improve the total energy rating of the building by at least one letter on the carbon dioxide emission scale (kg CO<sub>2</sub>/m<sup>2</sup>year) as compared to the initial energy rating of the building.

Eligible beneficiaries of the aids from this Programme are:

- Natural and legal persons, owners of residential and hotel buildings.
- Associations of property owners or Associations of residential-building property owners.
- Owners of single-family houses or sole owners of residential buildings.
- Energy service companies.

All types and beneficiaries are entitled to receive a money allowance without consideration, supplemented with a refundable loan. The amount of the direct aid to be allocated shall be the sum of the Base Aid and the Extra Aid. The additional aid up to the top amount to be received will depend on the following criteria:

TYPE OF ACTION	BUILDING USE	MONEY ALLOWANCE WITHOUT CONSIDERATION					
		BASE AID	% ADDITIONAL AID				
			Social Criteria	Compreh. Action	Energy Efficiency		
					"A" Final Rating	"B" Final Rating	Two-letter Upgrade or Higher
Upgrade of the energy efficiency in the thermal envelope.	Household	30% (limit 6 000 €/household)	15%	20%	15%	10%	5%
	All other uses		0%	20%	15%	10%	5%
Upgrade of energy efficiency in thermal & lighting installations.	Household	20%	0%	0%	10%	5%	0%
	All other uses		0%	0%	10%	5%	0%
Replacement of conventional energy by thermal biomass in building thermal installations	Household	25%	5%	10%	0%	0%	0%
	All other uses		0%	10%	10%	5%	0%
Replacement of conventional energy by geothermal energy in building thermal installations	Household	30%	10%	15%	0%	0%	0%
	All other uses		0%	15%	10%	5%	0%

Source: MURE Database<sup>83</sup>

Aid may be requested during the period from the day following the publication of this resolution in the Official State Gazette on 31 December 2016. Notwithstanding the above, should there be any budget surplus at the completion date of the program, and the evolution of applications makes it advisable, the former deadline could be extended until no later than 31 December 2020.

<sup>83</sup> [http://www.measures-odyssee-mure.eu/public/mure\\_pdf/household/SPA40.PDF](http://www.measures-odyssee-mure.eu/public/mure_pdf/household/SPA40.PDF)

“Activation Plan in the State’s General Administration Buildings through ESCOS” (330 ESE Plan)”

The Activation Plan in the State’s General Administration Buildings through ESCOS (completed), approved by Agreement in Cabinet Meeting as of 11th December 2009, aims to achieve that 330 energy consuming centres that belong to the State General Administration should cut back their energy consumption by 20% in the year 2016, as set forth in the “Energy Saving and Efficiency Plan in the State General Administration’s Buildings (PAEE-AGE)”, through the implementation of saving and energy efficiency measures under the modality of energy services contracts signed with energy service companies (ESCOs).

The investment associated to this Plan amounts to M€2,350 and involves an annual final energy saving of 1.32 Mtoe as well as an annual reduction of emissions of 254 kt CO<sub>2</sub>. The implementation of this Plan is backed by various instruments and financing lines developed by the Government, the most remarkable of which are: financing instruments, which investment projects on saving and energy efficiency can resort to, particularly, the investments derived from the implementation of this Plan through the Energy Service Companies; a support line amounting to M€4.2 as compensation aimed at the ESCOs taking part; and a support line amounting to M€52.5 intended for energy saving and efficiency investment measures.

The last two support lines will get funding from the Action Plan on Energy Efficiency and Saving, and will be managed by IDAE.

#### 3.5.4.2 GREECE: VARIOUS SUPPORTING ACTIONS

The most relevant actions of financing low energy buildings have been performed through the ETEAN and had the form of Grants. All financing tools are now inactive.

Measures for energy efficiency improvements in school buildings

Through the program "Bioclimatic Demonstration Schools" the bioclimatic design is promoted in new or under construction public primary and secondary school buildings in order to save energy.

Actions that were funded include:

- the construction of school buildings having fully integrate the principles of bioclimatic design,
- the supply and installation of passive and active solar systems, hybrid systems and renewable energy systems including natural lighting and ventilation, solar chimneys, solar control shading systems and green roofs,
- various support systems and network connections including metering, data recording and monitoring of energy systems in buildings and the management and control function of E/M installations,
- studies and other activities.

The following actions to improve energy efficiency and rational energy management were funded:

- i. installation of building insulation, blinds, shading systems and other elements,
- ii. window fenestration replacement with new energy-efficient certified,
- iii. installation of passive solar heating systems,

- 
- iv. installation of systems of natural and artificial lighting,
  - v. installation of systems that contribute to the achievement of efficient natural and / or hybrid ventilation and cooling,
  - vi. bioclimatic interventions in the surrounding area (green areas),
  - vii. upgrading and modifying existing central heating and / or cooling systems as well as hot water production systems to more energy efficient and environmental friendly.

#### Measures for energy efficiency improvements in public buildings

The measure aims to the reduction of energy consumption of public buildings. Actions that were funded include:

- i. installation of building insulation, blinds, shading systems,
- ii. window fenestration replacement with new energy-efficient certified,
- iii. installation of passive solar heating systems,
- iv. installation of systems of natural and artificial lighting,
- v. installation of systems that contribute to the achievement of efficient natural and / or hybrid ventilation and cooling,
- vi. bioclimatic interventions in the surrounding area (green areas),
- vii. upgrading and modifying existing central heating and / or cooling systems as well as hot water production systems to more energy efficient and environmental friendly,
- viii. installation of BMS

#### 3.5.4.3 ITALY: SOME MEASURES PROMOTED BY THE REGIONS AND MUNICIPALITIES

Local authorities have been especially active in promoting the energy efficiency of buildings<sup>84</sup>. By way of example we list below a non-exhaustive list of the current regional schemes.

##### Campania Region

Programme “Efficient energy – Plan to promote and support energy efficiency in the Campania Region”. This scheme has a budget of EUR 115 million which will fund specifically:

- projects to install renewable power plants supplying buildings owned by the Municipalities, local health authorities, hospitals, water management bodies and the regional railway system;
- actions to support technology innovation to strengthen and optimise low, medium and very high voltage networks to achieve energy savings;
- projects to improve the energy efficiency of public buildings.

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<sup>84</sup> [https://ec.europa.eu/energy/sites/ener/files/documents/2014\\_neeap\\_en\\_italy.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_italy.pdf)



The beneficiaries of the financing are municipalities, local health authorities, hospitals, water management bodies, industrial development consortia, operating agencies of the Region, subsidiaries and/or transport companies of the Campania Region rail transport system.

#### Lazio Region

The Lazio Region has launched a “call for expressions of interest” to identify public buildings to be targeted by projects under Activity II.1 “Energy efficiency and energy from renewable sources” of ROP ERDF 2007-2013. The purpose of this initiative is to support projects to develop and spread the use of renewable energy sources, save energy and contain air pollution emissions via actions to improve the energy efficiency of public buildings in the Region.

The funding for the projects selected through the call for proposals is EUR 25 000 000 and is broken down by type of building as identified in Article 4 of the Regional Operational Programme ERDF 2007-2013.

#### Autonomous Province of Bolzano

Grants for the installation of systems for the individual measurement of energy demand for heating, cooling and domestic hot water. The capital grants cover up to 30% of eligible costs. The minimum cost estimate must be at least EUR 4 000.

#### Piedmont Region

The Regional Executive has approved Action Plan 2012-2013 which includes a chapter on “Energy efficiency”, with five action lines for the development of energy efficiency projects and rationalisation of energy consumption in public buildings and in residential buildings, and actions to reduce energy consumption by businesses also by improving the energy efficiency of production processes. Under these action lines, a number of calls have been approved for granting interest subsidies, capital grants covering part of the investment and co-financing through partner banks. The total budget of these calls is approximately EUR 5 million.

#### Umbria Region

The Regional Executive has approved a programme for the energy upgrading of regional-interest buildings providing a capital grant of EUR 2 million (covering 100% of costs)<sup>85</sup>. Several calls have been approved providing capital grants for municipal level projects for the energy upgrading of buildings, public lighting, district heating networks and the installation of photovoltaic solar panels.

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<sup>85</sup> <http://www.managenergy.net/financing/instruments#.Vt6hCMw2vGg>

### 3.5.5. CASE STUDIES

#### ELENA – ENERGY EFFICIENCY MILAN COVENANT OF MAYORS

In 2011 the Province of Milan (Italy) started a new energy efficiency program for public buildings. The province of Milan applied for the ELENA funds in order to receive a qualified technical, legal and economic-financial evaluation support. Therefore, the Province of Milan selected a professional team that helped into structuring a new Energy Performance Contract scheme to be adopted with the ESCOs for the implementation of the investments. ELENA granted the 90% of the technical assistance costs thus helping the municipality to receive an adequate technical and professional support

For on-going and completed ELENA project please refers to the following link:

<http://www.eib.org/products/advising/elena/projects/index.htm>

[http://www.eib.org/attachments/elena\\_completed\\_projects\\_en.pdf](http://www.eib.org/attachments/elena_completed_projects_en.pdf)

Main figures of the projects are shown in the following table.

	Planned	Results	Notes
<b>Number of Municipalities</b>	30-40 Small Munis (< 30.000 inh)	16 Small Munis (200,000 inh.) + the City of Milan (1.5 M.inh.)	31 Small Munis (400.000 inh.) (foresaw within the void tenders)
<b>Number of Bldgs.</b>	350 Buildings	98 Bldgs. in the 16 Munis 38 Bldgs. in Milan city	197 Bldgs. (foresaw within the void tenders)
<b>Investments</b>	€ 90 Mln	€ 13 Mln for small Munis € 5 Mln for the city of Milan	Expected € 18-20 Mln within the void tenders
<b>Of which From EIB credit line: Mediocredito Italiano</b>	€ 65 Mln	€ 5 Mln	3 out of 4 ESCOs winning the first tender got the EIB loan
<b>Technical Assistance (90% Elena Funding)</b>	€ 2,1 Mln	€ 1,8 Mln	Lower Costs by € 300.000

TABLE 17. MAIN FIGURES OF ELENA CASE STUDY<sup>86</sup>

<sup>86</sup> Source: Prof. Sergio Zabet – Politecnico di Milano – Former ELENA project director at the Province of Milano – EASME, Bruxelles October 8, 2014 - [http://managenergy.net/lib/documents/1217/original/Milan\\_-\\_Sergio\\_Zabet.pdf?1412843661](http://managenergy.net/lib/documents/1217/original/Milan_-_Sergio_Zabet.pdf?1412843661)

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## 3.7. FISCAL & OTHER INCENTIVES

### 3.7.1. GENERAL DESCRIPTION

A fiscal incentive is a “*monetary benefit offered to consumers, employees and organizations to encourage behavior or actions which otherwise would not take place. A financial incentive motivates actions which otherwise might not occur without the monetary benefit*<sup>87</sup>”. Fiscal Incentives usually are tax measures targeted to encourage and support certain measures. National and regional authorities introduce various taxes, penalties and fiscal incentives (Tax Reduction, Tax Credit, Reduced VAT, White Certificates (Energy Supplier Obligations), etc.) in order to support actions that will improve the energy efficiency of the buildings. An example could be the relation of the property taxes to the energy label (consumption) of a building. Likewise, incentives can be given to renovations that result in improved efficiency characteristics as they are depicted on the building’s EPC. Authorities can create control mechanisms and impose penalties if an EPC fails to comply with energy measures. While some of the incentives are widely used like the tax reduction others are specific only for small number of countries. It is important to understand the pro and cons of these incentives in order to consider them in the financing of nZEB projects.

### 3.7.2. BRIEF DESCRIPTION OF MAIN FORMS OF FISCAL & OTHER INCENTIVES

#### 3.7.2.1 TAX INCENTIVES (FINA-RET)

A tax incentive is “any measure that provides for a more favorable tax treatment of certain activities or sectors compared to what is available to general industry” or “*a reduction in taxes that encourages companies or people to do something that will help the country's economy*<sup>88</sup>”. Tax incentives are considered a popular instrument due to the fact that they are less government’s cash liquidity, than subsidies or grants. They can take various forms such as tax exemptions, income tax or VAT reduction. National policy makers adopt this measure and it is stated in a law containing all the details concerning eligibility criteria and the amount of allowance (usually as a percentage of the investment).

Tax incentives are not appropriate for public buildings as they belong to the general government or public organizations that don’t pay taxes.

#### 3.7.2.2 FEED-IN TARIFFS

A feed-in tariff is a premium in the energy price that is paid by the national authorities when purchasing power energy produced by PV installations and sold by individuals.

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<sup>87</sup> Online Business Dictionary (<http://www.businessdictionary.com/definition/financial-incentive.html>)

<sup>88</sup> Cambridge Dictionary (<http://dictionary.cambridge.org/dictionary/english/tax-incentive>)

# FIT Policy: Application in Europe

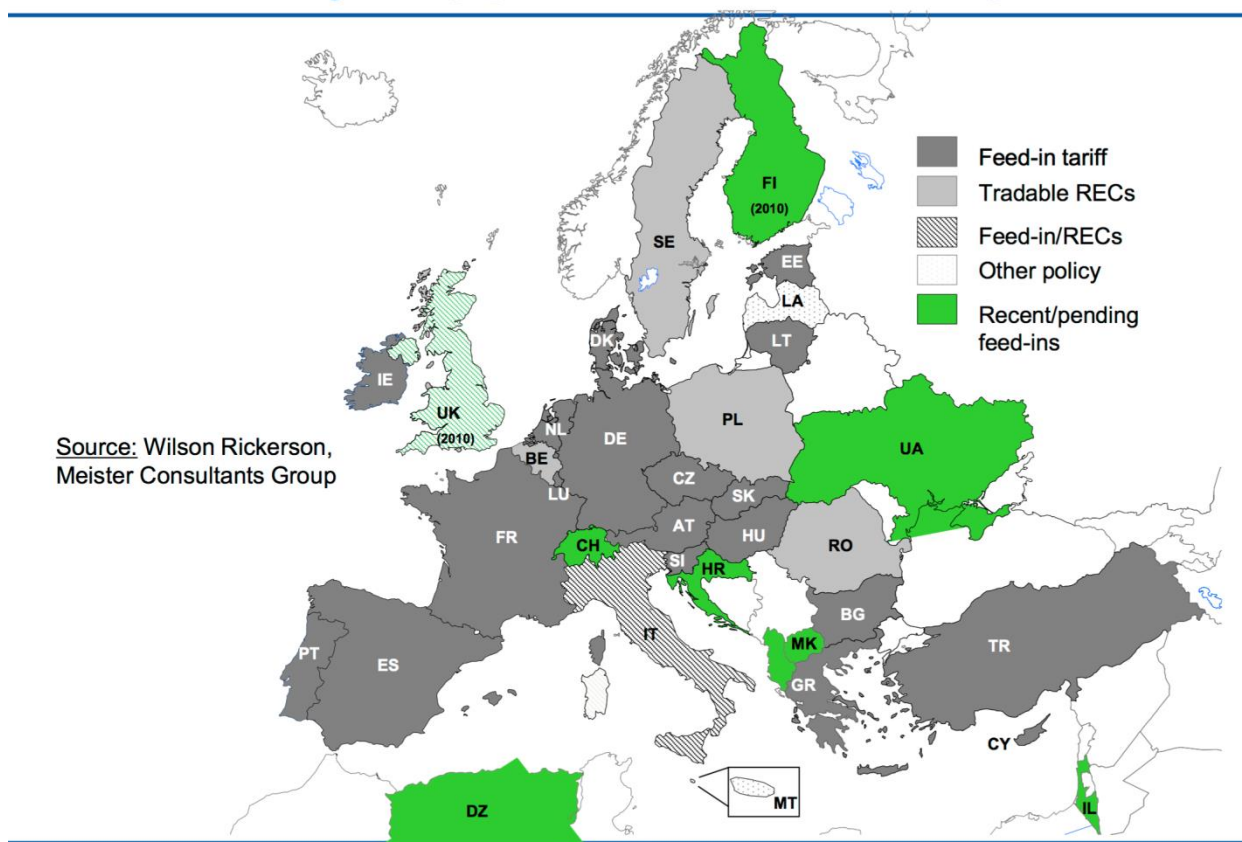


FIGURE 25. FIT POLICY: APPLICATION IN EUROPE<sup>89</sup>

## 3.7.2.3 NET METERING

An outcome of the energy retrofitting studies of the twelve (12) municipal buildings that are reviewed under CERTuS is that the installation of a PV for net metering could be useful in order to become nZEB. Financially, the selection of using a net metering system, comparing a feed-in tariff, can be partially explained by the fact that feed-in tariffs are lower than the equivalent cost of electricity from the grid.

Net-metering is a very important step forward and it is available to all four South European countries (Greece, Italy, Portugal and Spain). The connection to the national grid is necessary in order for the building to operate during PV off time and to cover peak loads.

<sup>89</sup> [http://www1.eere.energy.gov/wip/solutioncenter/pdfs/tap\\_webinar\\_20091028.pdf](http://www1.eere.energy.gov/wip/solutioncenter/pdfs/tap_webinar_20091028.pdf)

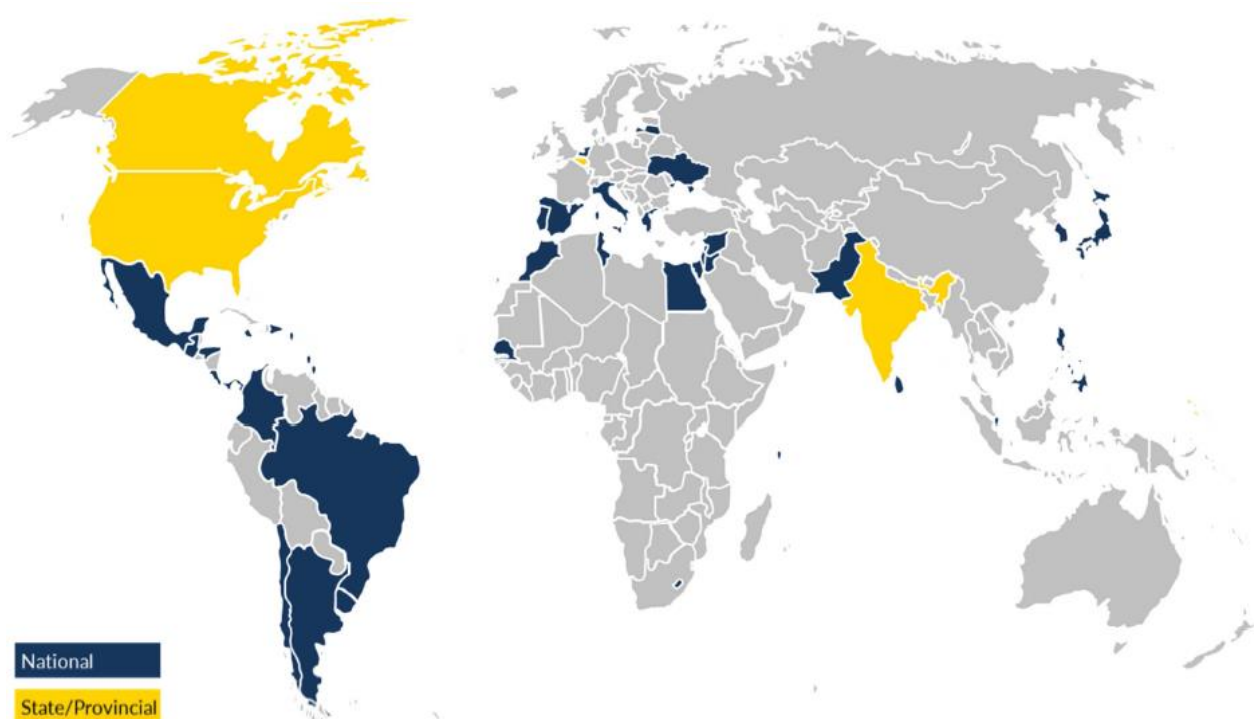


FIGURE 26. AVAILABILITY OF NET METERING SCHEMES

#### 3.7.2.4 WHITE CERTIFICATES

A white certificate, also referred to as an Energy Savings Certificate (ESC), Energy Efficiency Credit (EEC), or white tag, is an instrument issued by an authorized body guaranteeing that a specified amount of energy savings has been achieved<sup>90</sup>. Each certificate is a unique and traceable commodity carrying a property right over a certain amount of additional energy savings and guaranteeing that the benefit of these savings has not been accounted for elsewhere.

#### 3.7.2.5 ON-BILL REPAYMENT MECHANISM

The On-Bill repayment mechanism allows for the energy-efficiency repayments to be collected within the utility, tax or bill payment as already been set up<sup>86</sup>. As long as the Municipality (the client in our case) has a good “credit history” paying its electricity, gas and other bills on time you can have a good indication of a low default risk and thus make the project more attractive to investors. From market practice on-bill repayment is popular among investments in buildings.

#### 3.7.3. ADVANTAGES, DISADVANTAGES AND OTHER CONSIDERATIONS

Fiscal & other Incentives have the meaning of a grant in the long term, as they don't support the construction or/and installation of a system or infrastructure but their use. Financially it means that

<sup>90</sup> [http://wupperinst.org/uploads/tx\\_wupperinst/Pavan\\_BMU\\_10122009.pdf](http://wupperinst.org/uploads/tx_wupperinst/Pavan_BMU_10122009.pdf)

incentives are not given as a percentage of the capital cost in the beginning of the project but they are related with the use and the possible with the environmental benefits offering the project to the local and general environment.

So, it is obvious that the main disadvantage of incentives is that they don't contribute to the capital cost of the investment. On the other hand, they have many advantages, as:

- usually they support the efficient operation and use of the infrastructure or/and systems and not the construction or/and installation,
- with the same annual budget, they can support a bigger number of projects, comparing with grants,
- they don't require from the beneficiaries to follow a costly and time consuming procedure, like the competition in order to have a Grant,
- they trigger market money, with potential revolving effect.

Concluding, as long as a Project seems to be not attractive with market conditions, the use of incentives could be an efficient solution in terms of financial sustainability.

#### 3.7.4. CASE STUDIES

##### **ITALY:** Tax incentives

Italian public authorities are paying attention to environmental matters with a focus on RES and Energy Efficiency. The National Energy Efficiency Action Plan 2011 set a final energy consumption reduction target of 10.88 Mtoe/y to 2016, equivalent to a reduction of about 9.6% compared with the average consumption recorded over the period 2001-2005. Plan sets out a number of measures and incentive schemes designed to achieve energy savings in all energy-using sectors.

These measures may be summarised as follows:

- minimum energy performance standards for buildings;
- tax deductions for improving the energy efficiency of buildings;
- the energy efficiency certificates scheme ("white certificates")

Such provisions are included in the Finance Act where all the investments in energy saving on already-existing buildings benefit from 36% tax allowance and some VAT facilitations. Furthermore some specific investments for solar technologies benefit from 55% tax allowance, in addition to VAT facilitation. The Government and Parliament have extended the action through 2015 (up to June 2016 for actions on the common parts of buildings) and have raised the tax deduction rate to 65% but have already decided to revise the scheme, with a view to rationalizing expenditure, so as to transform the scheme into a structural incentive.

EEAP 2014 Italian Energy Efficiency Action Plan July 2014 -These provisions apply both to private individuals and to companies for energy efficiency investments in water heating and air-conditioning. Eligible costs include purchase, installation and other services needed in order to materialize these investments. The amount of the tax allowance is granted in three annual instalments.

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Eligible interventions<sup>91</sup>:

- Those who reduce energy consumption for thermal comfort in new buildings at least 20% less than current values as allowed for the new buildings (up to €100.000 in 3 years)
- Walls and windows insulation up to €60.000 in 3 years

**GREECE:** Tax incentives in Greece for energy efficiency investments have been introduced by the Ministry of Environment & Energy in late 2014<sup>92</sup>.

For the production of heating/cooling from RES, L2364/1995 passed in 1995 provided for a 75% deduction from taxable income of the acquisition cost of RES systems and was in force until 2002. This tax deduction was used mainly for the purchase of solar thermal systems (for the production of domestic hot water).

In December of 2006, L3522/2006 was passed and is still in effect. By this law the tax deduction scheme that existed with L2364/1995 is reactivated but with lower financial benefits namely, small domestic RES systems are eligible for a 20% tax deduction capped at € 700 per system.

In particular, this tax deduction applies to the following systems:

- a. the purchase of solar thermal collectors and the cost for the purchase and installation of central heating & cooling systems utilizing solar energy.
- b. the purchase of both RES systems (photovoltaics, small wind turbines) for covering residential electricity loads and co-generation systems (using natural gas or RES) for the electrical and cooling-heating needs.
- c. the cost for the replacement of an oil burning boiler with a district heating installation or for a new district heating installation. The law provides the same tax deduction for other types of applications such as:
  - changing from an oil-fired central heating & cooling system to a natural gas one or for the purchase of a new natural gas installation and
  - for thermal insulation works in existing buildings.

As with L2364/1995, these tax deduction benefits have been primarily used by the end consumers for the purchase of solar thermal systems for domestic hot water<sup>93</sup>.

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<sup>91</sup> [https://www.researchgate.net/publication/282851259\\_Italian\\_Financial\\_and\\_Energy\\_saving\\_policies\\_Cost-Benefit\\_Analysis\\_based\\_on\\_the\\_Enea\\_Reports\\_issued\\_within\\_the\\_survey\\_span\\_2007-2010](https://www.researchgate.net/publication/282851259_Italian_Financial_and_Energy_saving_policies_Cost-Benefit_Analysis_based_on_the_Enea_Reports_issued_within_the_survey_span_2007-2010)

<sup>92</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3d&tabid=37>

<sup>93</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3d&tabid=37>

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**Portugal:** Promoting energy efficiency in buildings

The Taxes area includes a series of measures aimed at promoting energy efficiency<sup>94,95,96</sup>. Concretely the following incentives have been record.

1. Program: Renew Home & Office

*“The objective of this program is to encourage the replacement of equipment in the residential sector and in the services sector, in order to make electric appliances electrical equipment and lighting more efficient”<sup>46</sup>*. The program is focused to promotion of:

- More efficient equipment
- Efficient lighting
- Efficient Window
- Efficient Insulation
- Green Heat

2. Program: Solar Thermal

*“The program aims to promote the integration of solar thermal systems into the building stock<sup>46</sup>”*.

The program is focused to promote:

- The installation of 800.000m<sup>2</sup> of collectors by 2016 and about 1.200.000m<sup>2</sup> by 2020 to residential buildings
- The installation of 330.000m<sup>2</sup> of collectors by 2016 and about 500.000m<sup>2</sup> by 2020 to services buildings

**Spain:** Promoting Energy Efficiency in the households and hotel sectors

This program is focused to the promotion energy efficiency improvement and use of renewable energy systems in the households and hotel sectors<sup>97</sup>. The supported actions are focused to the:

- Improvement of the thermal envelope energy efficiency.
- Improvement of energy efficiency in thermal and lighting installations.
- Replacement of conventional energy for biomass in thermal installations.
- Replacement of conventional energy with geothermal energy in thermal installations.

**Greece:** Feed-in tariffs

A feed-in tariff is an increase in the energy price that is paid by the national authorities when purchasing power energy produced by PV plants and sold by private individuals. In the buildings that are reviews under

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<sup>94</sup> <http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-portugal.pdf>

<sup>95</sup> [http://www.buildup.eu/sites/default/files/content/portugal\\_nr.pdf](http://www.buildup.eu/sites/default/files/content/portugal_nr.pdf)

<sup>96</sup> “2011 Survey of resource efficiency policies in EEA member and cooperating countries. COUNTRY PROFILE: Portugal”, European Environment Agency, 2011

<sup>97</sup> [PAREER Programme \(Aid Programme for Energy Rehabilitation in Buildings in the Household and Hotel Sectors\)](#)



CERTuS the Municipalities will be self-consuming as the current feed-in tariffs are lower than the equivalent grid electricity cost.

Name and reference of the measure	Type of measure (*)	Targeted group or activity	Start and end dates of the measure
Feed-in-tariff scheme per kWh of electricity produced by RES (Laws.2244/1994, 3468/2006, 3851/2010)	Financial	Investors	1994-to the present
Special Programme for the deployment of Photovoltaics up to 10kW on buildings and especially roofs (OG B' 1079 /4.6.2009)	Feed-in tariff scheme per kWh of electricity produced from PV roof installations (max.10kW)	End consumers, household sector, small businesses	2009 – 2019
Tax deduction scheme, set by L.2364/95 and L.3522/2006, that considers all small domestic RES systems to be eligible for a 20% tax deduction capped at € 700 per system.	Financial incentive	End users	1995-present

**TABLE 18. MAIN CHARACTERISTICS OF THE HELLENIC FEED IN TARIFF SCHEME**

In order to streamline the process of RES installations, greek authorities, complying with the European directive 2009/28/EC, L3851/2010 enacted on 4 June2010, set the following mandatory deadlines for the intermediate stages of the RES licensing procedure<sup>98</sup>:

- Production license: three (3) months
- Environmental Terms Approval: four (4) months for stations with a larger impact and two (2) months for project
- Terms and Conditions for Access to the Grid: four (4) months ts characterized as 'low or zero impact' stations.
- Installation License: forty five (45) days

#### **Greece: Net metering**

*"Net metering is a billing mechanism that credits solar energy system owners for the electricity they add to the grid"*<sup>99</sup>. The Greek net metering scheme is applicable only to solar PV systems. The upper limit for net-

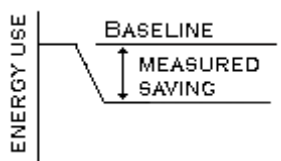
<sup>98</sup> <http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-greece.pdf>

<sup>99</sup> <http://www.seia.org/policy/distributed-solar/net-metering>

metering PV installations in Greece's grid is set at 20 kW or to the half power consumption of the consumer with maximum nominal installed power of 500 kWp<sup>100</sup>.

Currently (2016), net metering is assumed to be more financial attractive than the existing Feed-in tariff.

### White Certificates



When determining the extent of energy saving, the energy use is compared against a baseline, which is an estimate of the energy use in the absence of any attempt at saving energy.

In environmental policy, **white certificates** are documents certifying that a certain reduction of energy consumption has been attained. In most applications, the white certificates are tradable and combined with an obligation to achieve a certain target of energy savings. Under such a system, producers, suppliers or distributors of electricity, gas and oil are required to undertake energy efficiency measures for the final user that are consistent with a pre-defined percentage of their annual energy deliverance. If energy producers do not meet the mandated target for energy consumption they are required to pay a penalty. The white certificates are given to the producers whenever an amount of energy is saved whereupon the producer can use the certificate for their own target compliance or can be sold to (other) parties who cannot meet their targets.[1] Quite analogous to the closely related concept of emissions trading, the tradability in theory guarantees that the overall energy saving is achieved at least cost, while the certificates guarantee that the overall energy saving target is achieved<sup>101</sup>.

**ITALY:** ESC programs have their roots in initiatives such as the U.K.'s Energy Efficiency Commitment of 2002, NewSouth Wales' Greenhouse Gas Abatement Scheme of 2003, and Italy's White Certificate Scheme of 2005. Italy's energy efficiency program began in January 2005 with the goal of reducing energy intensity per unit of gross domestic product (GDP) by two percent annually until 2015 and scaling up reductions to 2.5 percent annually until 2030. Savings must be from implemented projects, not behavioral programs, and only savings achieved over and above market trends and legislative requirements are counted. Italy has an active over-the-counter trading market between the individual obligated parties. Prices for ESCs in Italy averaged approximately **70 euros** between 2006 and 2009<sup>11</sup> with each ESC signifying the avoidance of consumption of one tonne of oil equivalent.

Eligible entities and projects	<ul style="list-style-type: none"> <li>Electricity and gas distributors, ESCOs, consumers</li> <li>Projects from all sectors</li> </ul>
Pricing of certificates	<ul style="list-style-type: none"> <li>Private market</li> <li>Average €70 per tonne of oil equivalent</li> </ul>
Trading of certificates	<ul style="list-style-type: none"> <li>Managed by Electricity Market Operator (GME)</li> </ul>

<sup>100</sup> <http://www.ypeka.gr/Default.aspx?tabid=785&sni%5B524%5D=3460&language=el-GR#>

<sup>101</sup> [https://en.wikipedia.org/wiki/White\\_certificates](https://en.wikipedia.org/wiki/White_certificates)

#### Measurement & verification

- Reported yearly
- (1) Deemed savings
- (2) Measured factors
- (3) system monitoring

**OTHERS:** Tradable certificates have been introduced in Italy since 2005, In the pipeline: Poland and Ireland. The Netherlands, **Portugal**, Romania and Bulgaria are interested in this policy instrument.

References:

[https://www.iea.org/media/workshops/2011/aupedee/Paolo\\_Bertoldi.pdf](https://www.iea.org/media/workshops/2011/aupedee/Paolo_Bertoldi.pdf)

<http://www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20and%20Climate%20Policy/Issue-Brief--Energy-Savings-Certificates,-ENG.pdf> (pricing)

<http://www.nrel.gov/docs/fy09osti/45970.pdf>

#### On-Bill Repayment Mechanism

A strong driver for energy efficiency investments is having a standardized and regulated environment. A simple on-bill repayment mechanism will have an important positive effect. On-bill financing instruments (utility and tax bill) will be of interest as they enhance the seniority of repayments, resolve split incentives and provide a track record of repayment which may be attractive to ESCOs and project financiers for Municipalities with low credit ratings.

**ITALY:** The repayments for energy efficiency investments could be made with an existing, trust worthy and well-functioning payment system as is the existing used by Utility companies to collect taxes, electricity bill, municipal charges etc. Such examples are the PACE system in the US and the Green Deal in the UK.

Securing the payments is very important since each energy efficiency investment has unique characteristics. They are not repaid via clearly identified receivables which could be pledged but instead there is uncertainty over the revenue stream expected. Using on-bill financing you secure a consistent repayment.

### 3.8. OTHER EU FUNDS

The EU provides funding for a broad range of financial tools/instruments under two mega Funds, the European Structural and Investment Funds (ESIF) and the COHESION FUND. Both funds support financial instruments that could take the form of loans, equity and guaranties. In the previous paragraphs have been mentioned those tools/instruments. Following is given an overview of the two mega Funds.

#### European Structural and Investment Funds (ESIF)

ESI Funding programmes focus heavily on energy efficiency investments, particularly on the energy efficiency of buildings and Small and Medium-sized Enterprises (SMEs). ESI Funds represent the largest allocation of the EU budget for low-carbon investments, supporting energy efficiency, renewable energy and sustainable urban mobility projects. ESIF works with Member States, which could potentially provide financing to municipalities in the form of Grants. The relevant budget for 2014 – 2020 is €13.3 Billion.

European Structural and Investment Funds 2014-2020 (ESIF) consists of the following five EU funds: European Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF). The funds are used in agreement with between each EU Member and the Commission and each Member State is responsible for the selection, implementation and monitoring of the co-funded projects.

Financial instruments supported by the ESIF must comply with specific regulatory provisions which are set out in a range of legislation: the Common Provisions Regulation (CPR) which governs implementation of ESIF; each of the fund-specific regulations and several related delegated and implementing regulations. The ESIF financial instruments work as can be shown to the following figure.

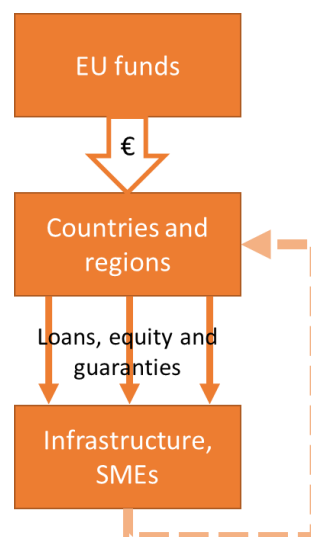


FIGURE 27. HOW FINANCIAL INSTRUMENTS WORK<sup>102</sup>

<sup>102</sup> "A sustainable way of achieving EU economic and social objectives: Financial instruments", [www.fi-compass.eu](http://www.fi-compass.eu)

## COHESION FUND

The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. It aims to reduce economic and social disparities and to promote sustainable development<sup>103</sup>.

The Cohesion Fund will support investments into climate change adaptation, water and waste sectors. Investment into energy is also eligible for support, provided it has positive environmental benefits. The Fund will therefore support investments into energy efficiency and renewable energy.

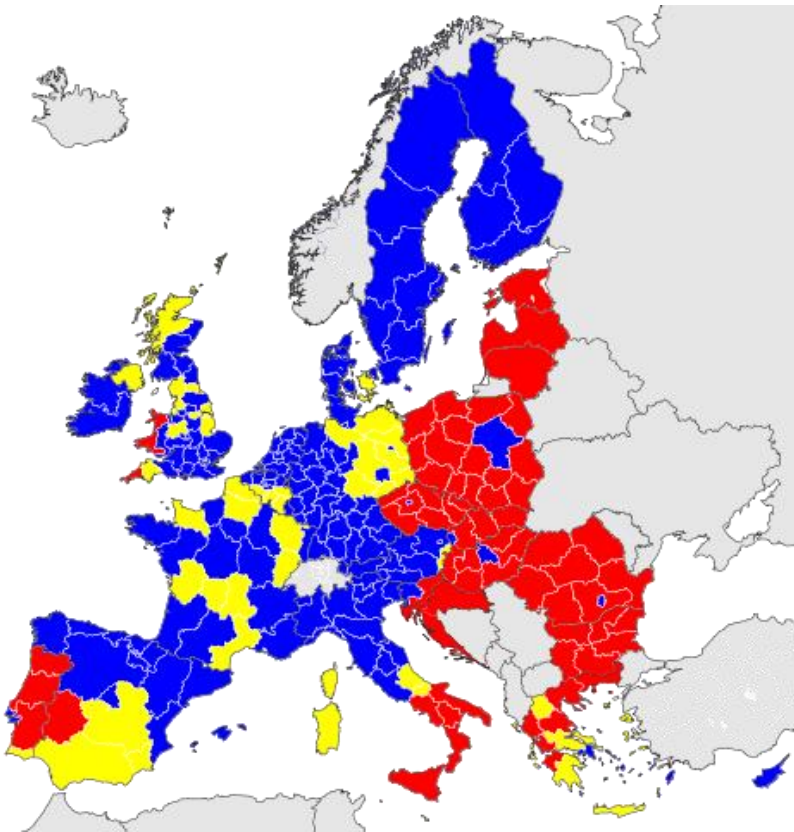
Supported financial instruments through the Cohesion Fund could take the following forms:

- *“Loans, which may be available where none are offered commercially (e.g. from banks), or may be on better terms (e.g. with lower interest rates, longer repayment periods, or fewer collateral requirements)”<sup>52</sup>.*
- *“Guarantees, where assurance is given to a lender that their capital will be repaid if a borrower defaults on a loan”<sup>52</sup>. This can unlock access to commercial loans for investments which lenders might consider too risky”. For example, an energy service company (ESCO) could be used to finance a Municipality’s energy efficiency nZEB project.*
- *“Equity, where capital is invested in return for total or partial ownership of an investment vehicle; the equity investor may assume some management control and may share the profits. The return depends on the growth and profitability of the business and is earned when the investor sells its share of the business (“exits”) to another investor or through an initial public offering (IPO)”<sup>52</sup>. Equity is most likely to be relevant for higher risk activities where the cash flow is not secured and depends on collection of Municipality taxes.*

<b>Typology</b>	Period 2014 - 2020 Loans, Guarantees, Equity
<b>Objective</b>	Promote measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change <sup>104</sup> .
<b>Sector</b>	Except others, energy or transport projects, as long as they clearly benefit the environment in terms of <b>energy efficiency</b> , use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport, etc.

<sup>103</sup> <https://www.fi-compass.eu/sites/default/files/publications/CF-factsheet.pdf>

<sup>104</sup> Website: [Cohesion Fund](#)

<p><b>Beneficiaries</b></p>	<p>For the 2014-2020 period, the Cohesion Fund concerns Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, <b>Greece</b>, Hungary, Latvia, Lithuania, Malta, Poland, <b>Portugal</b>, Romania, Slovakia and Slovenia</p>  <p>Classification of regions from 2014 to 2020<sup>105</sup>:</p> <ul style="list-style-type: none"> <li><span style="color: red;">■</span> Less developed regions</li> <li><span style="color: yellow;">■</span> Transition regions</li> <li><span style="color: blue;">■</span> More developed regions</li> </ul>
<p><b>Allocation</b></p>	<p>The Cohesion Fund allocates a total of € 63.4 billion</p>
<p><b>Maximum coverage</b></p>	<p>For contributions to an EU-level financial instrument under Commission management the co-financing rate for this priority axis or national programme could be up to 100%</p>

**TABLE 19. MAIN CHARACTERISTICS OF THE COHESION FUND**

<sup>105</sup> [https://en.wikipedia.org/wiki/Structural\\_Funds\\_and\\_Cohesion\\_Fund](https://en.wikipedia.org/wiki/Structural_Funds_and_Cohesion_Fund)

## 4. KEY FINDINGS AND RECOMENDATIONS

There are many different ways of financing an energy efficiency project and so Municipalities that want to renovate their building stocks can choose their best solution among many different instruments. In particular, given the strict budget constraints Municipalities undergo to and the low availability of cash, one of the best solution for the realization of an energy efficiency project in general would be the activation of a Public-Private Partnership. This way, the private subject (usually an ESCo) would take charge of the investment costs and get a profit from energy savings while the Municipality would immediately benefit from the renovation of its buildings and, in some cases, from an immediate reduction of energy costs. At the end of the contract with the private subject, the Municipality would benefit from the whole energy savings gained.

Anyway, as we know from the results of previous deliverables of the CERTuS project, nZeb projects are usually not sustainable at market condition and thus need financial support. Therefore, this kind of project would not be attractive for a private investment without a contribution from the Municipality or without the availability of subsidized or dedicated funds. This is one of the reasons why Governments and Financial Institutions, both at European and National/Regional level, offer different programs and funds, including:

- **Grants:** non-reimbursable direct contributions, by way of donation. They usually cover only a part of the total cost and should therefore be combined with other financing mechanisms such as subsidized/dedicated funds, bank loans or private investments in some PPP form. Grants are useful to finance deep renovation projects with very long pay-back times, like in nZeb projects, but their amount is usually limited and they have no revolving effect;
- **Subsidized and dedicated funds:** financial instruments mainly consisting in preferential loans. These loans usually have lower interest rates and longer maturities. Subsidized funds are useful instruments because they may activate co-funding and private investments and because their revolving mechanism makes it possible to finance new projects with cash flows coming from loan repayments;
- **Fiscal and other incentives:** for the realization of energy efficiency and renewable energy projects, Governments may apply tax reduction or give incentives. This kind of incentives vary across Countries and may include tax reduction on investments, feed-in tariffs to electric energy generated from renewable sources and incentives on energy savings (white certificates).

Equity and Debt. Debt: regular loans or bonds bearing interest rates consistent with market standards. Municipalities usually undergo strict financial regulations and it's difficult for them to obtain bank loans or to issue Bonds on the market. In case of activation of a Public-Private Partnership with Third Party Financing, the ESCo takes charge of providing the project with debt and with own resources. In PPP projects, ESCOs may obtain limited-recourse financing (Project Financing), or, for large projects, it may issue Project Bonds on the market.

Considering a standard nZEB project showing long pay-back times and low or null returns, it's very important for the investor, being it a Municipality or an ESCo, to reduce the cost of capital in order to make the project more attractive. For this reason, subsidized funds are good financial instruments in combination with equity and debt, because:

- They allow the investor to commit a lower amount of money into the project;
- Their low interest rate allow the investor to receive higher cash flows from the project;
- Their longer maturity may shorten the pay-back period of the investment.

Other instruments that may help the reduction of the cost of capital are guarantees. Guarantees are a type of risk sharing mechanism where the guarantor (e.g. a public body) assumes a debt obligation should a borrower default. Guarantees, even if they don't change the borrower's creditworthiness, makes projects more reliable for a financier (e.g. a bank) and thus help the investor to obtain loans at interest rates consistent with market standards.

Even through the study of 12 CERtuS projects it was possible to confirm that several levers must be considered in order to increase the number of interventions. In particular it is important to:

- Activate Technical Assistance in order to structure projects that can meet the needs of the stakeholders concerned, both public and private;
- Consider that the financial viability of these projects must result from a in-depth analysis of the available resources at the Municipal, Regional, European level and banking and private market. Each project, according to their distinctive characteristics, at the time in which will be realized may have or not a certain mix of funding instruments. Search for the right mix of funding sources is a process that requires the interaction of stakeholders with different roles and skills;
- Identify forms of development for the realization of these projects that encourage the use of Public Private Partnership;
- Provide for adequate project monitoring tools involving the entire project process, from the "idea", to the construction phase until the management phase in order to verify energy efficiency obtained;
- Activate an important communication's action about the project's results and activate training courses about energy efficiency and nZEB projects.

#### Fund Matching

As shown in D2.5, there's no one optimal financing scheme for an intervention because each renovation option shows different pay-back times and most of them don't show an adequate return on capital invested by an ESCo without specific financial support. Thus, each intervention should be financed with a mix of different funds.

Given a specific project, a Municipality should find out the best solution available by benefiting from the different financial instruments available for that specific intervention. While ESCo equity investment and third party finance should be considered preferable in terms of less expenditure for the Municipality and risk allocation to the private subject, often for nZEB project a financial support in terms of grant or subsidized loan is necessary in order to make the project attractive for ESCos.

As shown in previous paragraph, a Municipality could use many different financial instruments to finance nZeb projects. In particular, both at EU level and national/regional level, many different forms of grant, incentives and subsidized loans are available. A Municipality should be able to apply for these instruments in order to be able to involve ESCo and structure a good EPC contract.

The analysis carried out on CERtuS projects shows as the use of the most appropriate financing schemes, in view of the specific characteristics of action on energy efficiency, is a critical component of the success of the project.

#### Technical assistance



As reported in previous paragraphs, structuring and managing NZEB initiatives requires appropriate skills and competences in various fields: procedural, technical, economic and financial. These competences allow the Public Entity to structure initiatives that:

1. Minimize the public grant contribution and maximize the private co-financing;
2. Allocate efficiently risks among involved parties;
3. Provide the real energy efficiency results.

Ideally, a NZEB initiative regarding public buildings:

Is developed with **Public Private Partnership** procedures;

- Favors the **matching** of different sources of finance;
- **Allocates risks** to the operators that can more effectively manage;
- Has a strong focus on **monitoring results** and annual fees for ESCOs depends on results obtained.

Usually Public Entities do not have all the aforementioned competences, so it may be useful to have an external support, with a wide spectrum of competences.

### Monitoring

A key factor in energy efficiency projects in general is the monitoring activities.

The monitoring of the ex-post energy performance and verification with respect to ex-ante estimates has influence over both public entities involved in the renovation action and private parties, such as ESCOs. In fact, the performance measurement allows to:

- Properly quantify the energy saving measures, parameters, the energy savings and the related economic return;
- Identify any deviations (under-performance and over performance) from the ex ante analysis;
- Update the economic projects cash flow;
- Measure the performance of ESCO;
- Apply correctly the contractual terms between the ESCO and the Municipality based on the performance and activities of ESCOs.

The monitoring system is fundamental for a E.S.Co. In fact, in the EPC logic, ESCOs revenues depends on the energy savings results.

There are several tools and monitoring protocols. It recalls the International Performance Measurement & Verification Protocol (IPMVP), the application of the metering, measurement system, which always through the identification of engineering protocols allows the description of the trend of the energy savings.

### PPP and Risk Capital:

A relevant issue featuring the energy efficiency sector (at least in South of Europe Countries) is the undercapitalization of the large majority of Energy Service Companies (ESCOs).

The market is therefore made of few well capitalized ESCOs (usually related to large building and facility management companies) and many under-capitalized SMEs that cannot afford to participate in large and complex procedures (as PPP typically are) and face many difficulties to activate EPC contracts.

In order to promote a larger competition among ESCOs and at the same time to enhance their capital level of operators, risk-financing monitoring instruments might be useful. Equity Investment Subsidized project vehicles Funds investing in risk capital of ESCOs could solve the problem of under-capitalization of the ESCOs and allow them to join in a PPP procedures. In addition the small ESCOs could have more capital available to invest into their energy efficiency projects.

These instruments should have “under the market” financial return expectations (i.e. Subsidized Funds backed by public entities) and they could operate in two main ways:

1. **Greenfield** – in this case the Subsidized Fund cooperate with the Local Authority and in the Terms of Reference of the call for the selection of the Project Vehicle it is foreseen the presence of the Subsidized Fund as equity investor, in order to avoid State Aid issues (as represented in the figure that follows).
2. **Brownfield** – here the Subsidized Fund invest in the capital of ESCOs that already obtained public concession, but that need financing to realize interventions.

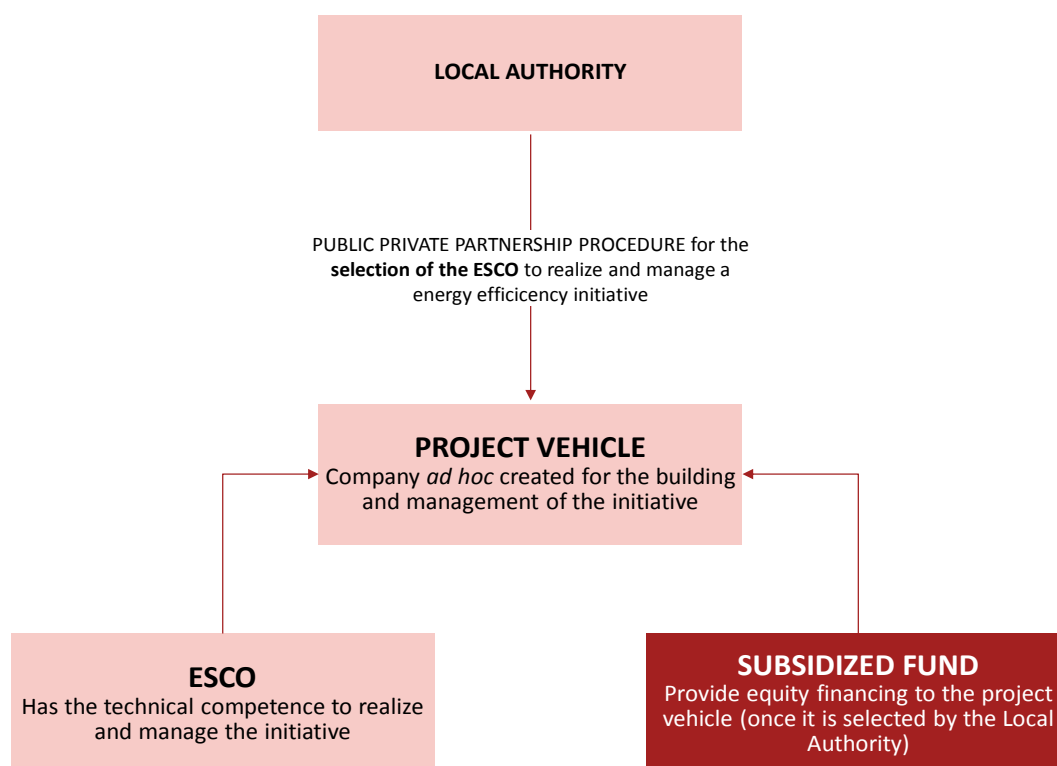


FIGURE 28. SIMPLIFIED FINANCING PROCEDURE

Greenfield and Brownfield solutions have pros and cons, as reported in the table below, highlighting particular aspects to be considered in the structuring the Subsidized Funds strategy.

	<b>GREENFIELD INVESTOR</b>	<b>BROWNFIELD INVESTOR</b>
Brief investment description	The Subsidized Fund (SF) operates since the beginning of the initiative, therefore it supports the Local Authority in the project structuring	The SF operates once the concession is awarded, therefore it cannot contribute to the project structuring
Procedural risk	<b>HIGH</b> The SF has to cooperate with the Local Authority to structure the initiative and then then it has to wait until all administrative and design issues are over to invest in the project vehicle	<b>LOW</b> The procedure is over when the SF invests in the Concessioner, therefore administrative and design issues are over
Market Impact	<b>HIGH</b> <ul style="list-style-type: none"> <li>• New initiatives are developed with the support of SF</li> <li>• The SF is an element to “open the market” promoting the participation to the call for tenders of more ESCOs because all participants know they could access SF resources</li> </ul>	<b>MEDIUM</b> <ul style="list-style-type: none"> <li>• SF support initiatives already developed but facing financing issues</li> <li>• The ESCO receiving the SF investment was already been awarded of the concession</li> </ul>

**TABLE 20. MARKET IMPACT AND RISKS FOR GREENFIELD AND BROWNFIELD INVESTORS**







ENEA - Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development (IT)



Municipality of Messina (IT)



Municipality of Erreterria (ES)



Municipality of Coimbra (PT)



Municipality of Alimos (EL)



ISR University of Coimbra (PT)



SINLOC - Sistema Iniziative Locali Spa (IT)



ETVA VI.PE. S.A. (EL)



TECNALIA Research & Innovation Foundation (ES)



EUDITI Energy and Environmental Design LTD (EL)



Innova B.I.C. Business Innovation Centre S.r.l. (IT)



AUU - Aalborg University (DK)



ASSISTAL (IT)

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