

A photograph of a European street scene featuring a prominent church tower with a spire and a weather vane. The buildings are multi-story and have a classic architectural style. A large, semi-transparent teal circle is overlaid on the image, containing the title and subtitle text.

Learning Handbook

Private Buildings Module

Encourage energy efficiency in private buildings by using innovative financing schemes.

This module covers buildings and facilities owned, managed or controlled by private individuals. This refers to the tertiary sector (services), such as the private companies, banks, commercial, and retail activities, hospitals, etc. and residential buildings, including social housing.

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List of Abbreviations

BDPME	French development bank for SMEs
EBRD	European Bank for Reconstruction and Development
EERSF	Energy Efficiency and Renewable Sources Fund

EIB	European Investment Bank
EPBD	Energy Performance of Buildings Directive
ESCO	Energy Service Company
EU	European Union
IPP	Initial Project Proposal
SME	Small and Medium Enterprises
VSE	Very Small Enterprises

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Module Description

The module on private buildings covers buildings and facilities owned, managed, or controlled by **private individuals or corporations**. This refers primarily to the tertiary sector (services), such as private companies, banks, commercial, retail activities, and residential buildings, including social housing. Actions under private buildings can include renewable energy for heating; energy efficiency in heating; indoor lighting; and new construction or refurbishment.



Module Objectives

Mentee

At the end of this module, mentees can achieve the following learning objectives:

- Understand the innovative financing schemes relevant to private buildings
- Recognise the barriers, incentives, advantages, and disadvantages of the innovative financing schemes
- Examine which sustainable energy and climate action projects can be financed by innovative schemes
- Analyse the success factors and lessons learnt from successful projects financed by innovative schemes

Mentor

At the end of this module, mentors can achieve the following learning objectives:

- Share knowledge on innovative financing schemes that are relevant to the private buildings module

- Share practical experience in implementing sustainable energy and climate action projects and support others in overcoming different barriers
- Showcase sustainable energy and climate action projects financed by innovative financing schemes
- Learn from other cities and regions about what projects they want to implement and which innovative financing schemes they want to apply

Sectoral Challenges

According to the European Commission, the buildings sector accounts for 36% of the EU's carbon emissions and 40% of its energy use. Given this sizeable footprint, it is critical to ensure that new buildings are NZEBs so that their energy and carbon impact is reduced as much as possible ([BPIE, 2021](#)).

The EU composed a common framework, called **The Energy Performance of Buildings Directive** (EPBD), for enhancing energy efficiency in buildings. The EPBD becomes more stringent as it requires a goal of Zero Energy Buildings in a building energy code (Takagi et al., 2014). Applying energy efficiency in buildings might potentially help the EU achieve the target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels (EU Green Deal).

The opportunities for energy savings in buildings are quite high, up to 41% savings by 2035 (IEA, 2012a). However, the energy savings potential has not been widely recognised by the consumers or companies of the existing buildings, creating energy efficiency gaps (IEA, 2007). The EU acknowledged this issue and is more concerned about existing buildings that need substantial renovations and retrofits, as energy efficiency measures are already implemented in some new buildings (BPIE, 2010). Furthermore, starting in 2021, all new buildings in the EU must be nearly zero-energy buildings (NZEBs), meaning a building with a very high energy performance, and for which the remaining low energy needs are sourced primarily from renewable energy sources (BPIE, 2021).

It is commonly more challenging to promote retrofits of residential buildings due to the fact that the proprietors are not a single entity and the levels of individual investments and returns are low (ESMAP, 2014). Moreover, the *“split incentive”* is a key barrier to retrofitting, is: “the so-called split-incentive – also known as the tenant-landlord dilemma (...) captures a situation whereby landlords pay for, but do not gain any direct advantage from improvements in energy efficiency in the property, while tenants benefit from improved comfort and lower energy costs.” (ENPOR, 2021). However, this is not the case when the energy consumption is estimated and included in a fixed cost that needs to be paid by the tenant. The way in which the tenant consumes energy determines the amount of savings on the energy bill that the building owner can profit from.

The relatively low energy prices compared to other factors make energy efficiency investment seem less important to consumers and companies. They are more likely to invest in safety, health, comfort, and aesthetic improvements. This leads to a small proportion of their investments going to energy efficiency measures (BPIE, 2010). Finding affordable financing and attractive incentive

¹ As defined in COM (2011) 112: A Roadmap for moving to a competitive low carbon economy in 2050, COM (2011) 885: Energy 2050 Roadmap, and COM (2011) 571: Roadmap to a Resource Efficient Europe

schemes are a major challenge to improve energy efficiency investments in private buildings (ESMAP, 2014). The [ENPOR Project](#) also highlights the challenges and difficulties in being able to access funding and information for both tenants and landlords in terms of renovation and energy efficiency measures. (ENPOR, 2021).

Common Barriers

The [ENPOR Project](#) identified that the housing and residential sector are the second largest energy-consuming category in Europe, with 26.7% of total energy, and are responsible for around 8.5% of greenhouse gas emissions. “As much as 75% of the EU’s building stock is inefficient, and only 1% is renovated per year. Renovating and improving the energy efficiency of buildings could reduce the EU’s CO2 emissions and energy consumption by 5%. The European Commission calculates that in order to meet climate objectives, the rate of renovations must double (EC, 2020). Despite ambitious policies being introduced into this arena, there are nevertheless numerous policy barriers to implementing energy efficiency measures, particularly in the private rented sector, for which as many as 1/3 of EU citizens rely on for housing.” (Structural Factors Impacting Energy policies, ENPOR, 2021)

Due to high uncertainty, a high discount rate is adjusted, coupled with a long payback time making the investment in energy efficiency unappealing, especially to the financier who is not well-informed (BPIE, 2010).

Another barrier comes from legal institutions and bureaucracy. Inadequate laws and regulations for energy efficiency hinder the viability of energy efficiency project investment. Necessary knowledge about energy efficiency is also lacking amongst the actors in the building chain in general. A summary of key barriers is presented in Table 1.

Table 1: Key barriers in private buildings investments

Institutional, political and regulatory barriers	Informational/capacities	Financial and economic barriers
Lack of legal framework for energy efficiency	Lack of understanding of economy-wide benefits from energy-efficient retrofit	High-interest rates (approx. 12.5% in 2015)
Lack of compulsory or voluntary standards	Poor availability of information and statistical data on the existing building stock	Suppressed heating demand due to fuel poverty
Lack of legal recognition for potential condominium associations (CAs), which could mobilize collective investments	Lack of understanding of private benefits from energy-efficient retrofit amongst tenants/owners	No incentives to private banks for delivery of low- cost credit lines, resulting in minimal marketing efforts and extended administrative procedures
Lack of a responsible body or central information point for energy efficiency	Poor awareness amongst building occupants of best daily practices for energy efficiency	
No competition between electricity and gas distribution companies		

Source: Halonen, et al. (2017)

Typical Projects

Typical projects for the energy efficiency in private buildings can range from awareness campaigns to efficient heating in residential buildings. Below are the typical projects under private buildings, including a description of their features: from CO² saving potentials to estimated costs for municipality and target groups, and key actors. You can find more replicable practices from [PROSPECT +’s website \(https://h2020prospect.eu/replicable-practices/private-buildings\)](https://h2020prospect.eu/replicable-practices/private-buildings).

Table 2: Example of projects under private buildings

Action	CO ₂ -saving potential	Estimated costs for the municipality	Cost-benefit ratio	Implementation time frame	Target group	Key actors
Energy management for companies	Medium	Savings above expenses	Very high	2-3 years	Enterprises	Municipality and possibly external experts, enterprises
Awareness-raising of citizens regarding residential buildings	Medium-high	100-200 Euro/check	High	2-month preparation, 1-month campaign	Private owners	Municipality, energy expert
Energy advice service	High	Medium	Medium	3 months	Citizens	Municipality, energy experts and citizens
Electricity saving contest	High	Medium	Medium	3 months – 1 year	Citizens	Municipality, energy supply company and citizens
Improvement of indoor lighting	High	Medium	Medium to high	1 month	Enterprises	Municipality, enterprises, LED dealers
Efficient heating regarding residential buildings	Medium-high	Medium to high	Medium	2 months to 1 year	Private owners	Municipality, energy experts, GIS experts
Energy efficiency in new construction regarding residential buildings	Medium	Medium	Medium	1 year	Private owners	Municipality, energy experts, building enterprises
General energy efficiency guideline for procurement	Medium-high	Low	High	1 year	Enterprises	Municipality, enterprises

Energy management for companies

The aim of the [SEAP ALPS](#) project is to obtain energy savings by adjusting heating/cooling systems and recognising any malfunctions as well as the consumption behaviour. Energy management can be broken down into four actions: energy accounting, education for caretakers, adjustment to existing technical facilities, and annual report. Energy accounting includes monitoring energy consumption to identify necessary measures. Caretakers need to get training to maintain the technical equipment, such as heating systems. Adjusting heating and ventilation systems regularly may save energy up to 15% without breaking the bank. Annual reporting helps see the transparency of energy costs.

Awareness-raising of citizens regarding residential buildings

Since the Province of Torino, Italy, highly depends on gas and petroleum from abroad and neighbour regions for its energy sources, the provincial government feels the need for the transition to renewable sources and starts saving energy. The government promotes home energy efficiency to the citizens through informational booklets, presentations, videos, and technical data sheets that provide a concise but exhaustive picture on the importance of energy-saving. The government also developed an interactive software, which allows citizens to simulate the amount of energy that can be obtained by installing solar, thermal, and photovoltaic panels at home. Besides raising citizens' awareness, this also motivates the citizens to improve energy efficiency and save energy at home.

(http://www.provincia.torino.gov.it/ambiente/energia/sportelli_energia/index.html.)

Energy advice service

The target of this action is citizens looking to save and/or produce their own electricity and reduce their energy consumptions. The municipality should offer this energy advice service at no cost for the initial advice to attract and reach more citizens. The service should have the option to be performed right at the client's home, so a direct quick check on the energy can be executed to reveal saving potentials. The service should include information about incentives for energy-saving work and presenting the latest energy-saving technology.

Electricity saving contest

Residential buildings have a large energy saving potentials. To encourage citizens to be more aware of their energy consumption, thus saving energy at home, municipalities can organise an electricity-saving contest with attractive prizes. Municipalities can collaborate with the local energy supply company to make a large public relations campaign. The contest can start with participants showing their electricity bills for the last two years to set a baseline. The electricity bill for the following year is compared with the baseline. Participants who managed to save a certain percentage, for example, 10%, get a bonus. Savings above it will be given additional payment, e.g. 3 cents per kWh. The best participant wins the first prize.

Improvement of indoor lighting

Information events on how to reduce the energy consumption of lighting can be held by municipalities, targeting enterprises and private households. Municipalities may try to approach enterprises directly or give incentives to support the use of energy-efficient lighting in private buildings. Energy-efficient lighting includes LED technology with lower maintenance. The

lighting system can also be improved by regulating light intensity (dimming).

Efficient heating in residential buildings

Efficient heating systems can save 30% on energy bills. Municipalities can introduce the efficient heating systems to private households by providing information through flyers, the internet, etc. The information should cover any available potentials in efficient heating systems and how renewable energies can be used for heating systems. Cooperation with energy suppliers is recommended.

Energy efficiency in new construction regarding residential buildings

Municipalities can set energy standards for new residential buildings, e.g. by incentives (such as a bonus system for applying renewable energy and high insulation standard) and by urban development contracts. Marktoberdorf is a city in Germany that is active in advancing energy transition to renewable energies and climate protection. Regarding the new construction of residential buildings, the municipality has several types of residential buildings that can earn climate points, which then can be exchanged for certain incentives. For example, if the citizen builds an energy-optimized and ecological house, the citizen can earn points – for every point 0.90 € / m² is received. Types of residential buildings include passive house that uses very little or no energy and leverage the sun as a heat source.

More information on http://www.klimaschutz-marktoberdorf.de/downloads/Klimaschutzprogramm_Neubaugebiete.pdf.

General energy efficiency guidelines for procurement

A general efficiency guideline is of use to implement energy efficiency measures in all departments in enterprises, especially when it comes to procurement. The city of Kempten, Germany, created an energy guideline in 2016 for the construction and operation of urban real estate. The guideline includes thermal insulation in building construction, heating and cooling systems, lighting systems, etc.

More information on <https://www.kempten.de/energiemanagement-787.html>.

Good Practices

The table below presents the relevant financing schemes and examples of best practices, including the city or region where the best practice is located, and the source(s) of funds.

Table 3: Good practices under private buildings

Financing Scheme	City/Region	Best Practice	Source of funds
Soft loans & third-party financing	Picardy (FR)	Renovation of 2.000 private homes in 3 years, resulting in up to 75% energy savings. The 3pass renovation” has managed to be replicated in different regions and renovations are still ongoing: https://www.pass-renovation.hautsdefrance.fr/nos-realizations/	Local budget, national funds through subsidies from Agence National de l’Habitat (Anah) and French national energy agency ADEME, European Investment Bank loan, European fund through ELENA (European Local Energy Assistance) subsidy, and own funds (property owner)

Soft loans, third-party financing & revolving funds	Ile de France Region (FR)	A semi-public company called SEM Energies POSIT'IF facilitates energy renovation of a private condominium owners and social housing organisations	The regional fund, private funds and Europeanfund
EPC	Italy (IT)	The LEMON project provided ECPs to refurbish social housing. The ECP was an already existing instrument, but hardly used due to the poor regulation and the difficulty of applying it for local authorities. LEMON helped it spread through public events and workshops. The second instrument, the Energy Performance Tenancy Agreement (EPTA) is a lease with the rent reflecting the improvements made to the housing and the consequent reduction in energy costs. This contract allows the tenant and owner to share the benefits from efficiency gains. While the tenant benefits from a cost reduction of 10% to 30%, the owner benefits from the additional savings generated by the retrofitting intervention.	Regional budget. Private Buildings - Replicable Practices PROSPECT+ (h2020prospect.eu) (https://h2020prospect.eu/replicable-practices/private-buildings)
Third-party financing	France (FR)	The ORFEE project developed the first four French third-party financing companies. Its objectives are to strengthen their activities as technical and financial assemblers for the renovation of residential buildings	Regional funds. Private Buildings - Replicable Practices PROSPECT+ (h2020prospect.eu) (https://h2020prospect.eu/replicable-practices/private-buildings)
CSOP	EUROPE: Susa Valley (IT), Prague (CZ), Essen (GR)	The SCORE Project provides Consumer Stock Ownership Plans (CSOP) and helps consumers co-own a RE project through an intermediary – the CSOP Operating Company (usually a privately held corporation with limited liability but possibly also a cooperative). A trustee who consults with them and acts in their interest represents them on the board of directors.	Regional funds. Private Buildings - Replicable Practices PROSPECT+ (h2020prospect.eu) (https://h2020prospect.eu/replicable-practices/private-buildings)

For more information about the good practices above, see the [comparative study](#) and the [case studies](#) (http://www.energy-cities.eu/IMG/pdf/infinite_solutions_comparative_analysis_web.pdf, http://www.energy-cities.eu/IMG/pdf/guidebook_softloans_web.pdf) in the guidebook on financing the energy renovation of residential buildings. They were prepared in the framework of the **INFINITE Solutions project** (INnovative FINAncIng for Local SusTainable Energy Solutions,). Furthermore, see [RenoWiki EU](http://buildupon.eu/resources/) (<http://buildupon.eu/resources/>) for more resources related to initiatives of energy efficiency in buildings (including private buildings, such as residential and commercial buildings).

Funding Sources

How can private entities finance private building projects? There are different options for financing private building projects – from the city or municipality’s own resources through direct budget allocation and via revolving funds to using grants from sub-national or European funds.

Table 4: Source of funds for private buildings

No.	Source of Funds	Description
1	Own Funds	Funds drawn from the internal budget and resources
2	Local (City or Municipal) or Regional Budget	Funds drawn from the budget of local or regional public authorities
3	National Funds	Subsidies provided by national governmental bodies or funding through grants from national programmes
4	European Funds	Grants and contracts from the European Commission from the Funding and Tenders portal.
5	Managed at the EU level	Funds that provide technical assistance and project development, usually for demonstration/pilot projects (e.g. European Innovation Partnership on Smart Cities and Communities, European Research Framework Programme, and Intelligent Energy Europe II Programme)
6	Managed at the national, regional, or local levels	Funding resources and technical assistance, such as the European Structural and Investment Funds, which are managed by national, regional, or local public authorities in partnership with the European Commission through operational programmes based on strategic goals or investment priorities
7	European Banks	These include the European Investment Bank (EIB), the Council of Europe Development Bank (CEB), European Fund for Strategic Investments, Private Finance for Energy Efficiency, European Energy Efficiency Fund, and European Bank for Reconstruction and Development
8	Private funds	Financing provided by private contractors, utilities, by institutional investors, crowdfunding, and through energy cooperatives

All EU funding sources for local climate and energy actions (including private buildings) can be found in this [guide \(http://www.eltis.org/sites/default/files/quick reference guide - financing opportunities 2016.pdf\)](http://www.eltis.org/sites/default/files/quick%20reference%20guide%20-%20financing%20opportunities%202016.pdf).

Stakeholders Involved

There are several stakeholders with influence and power over the governance of buildings as presented in Figure 1 from the [World Resource Institute](http://publications.wri.org/buildingefficiency/#sec1) (<http://publications.wri.org/buildingefficiency/#sec1>). Governments implement energy efficiency policies and private-sector actors (e.g.: building owners, construction companies, architects, investors) deal with their building management, investment, construction, design, and energy performance. Other stakeholders from the private sectors (e.g.: building tenants and civil society organisations) also have a role in shaping the buildings' energy consumption (Becqué et al., 2016). Understanding the stakeholders' roles can help determine the city's "capacity to act" in building energy efficiency matters (Hammer, 2009; Hinge et al., 2013).

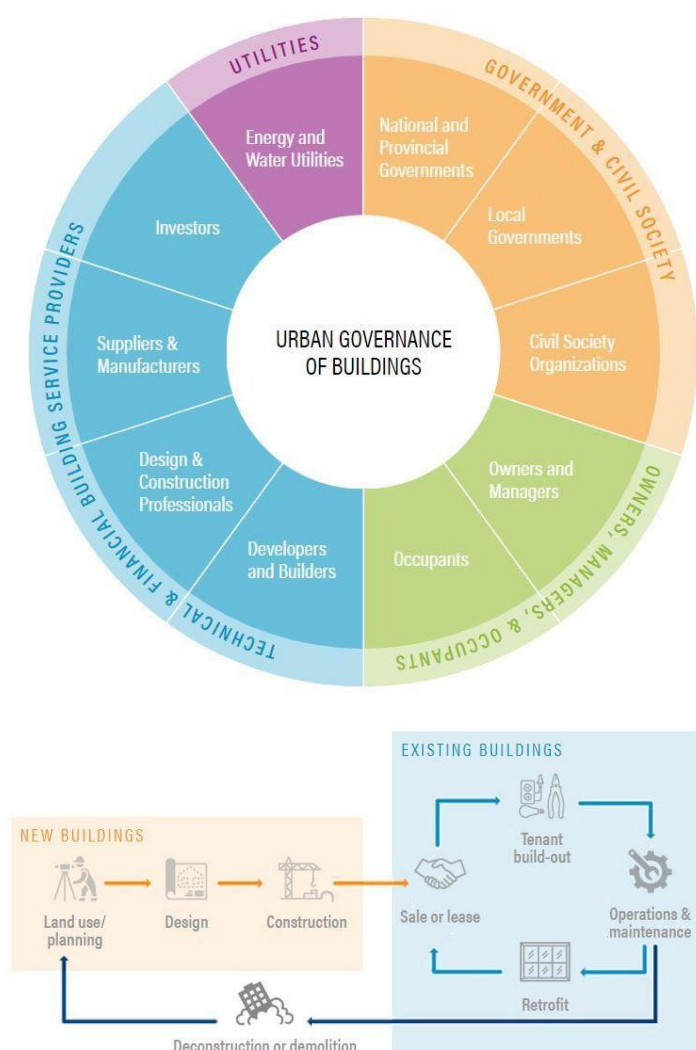


Figure 1: Stakeholders involved and lifecycle of buildings. Source: World Business Council for Sustainable Development (2009) and Becqué et al. (2016).

Decision Tree

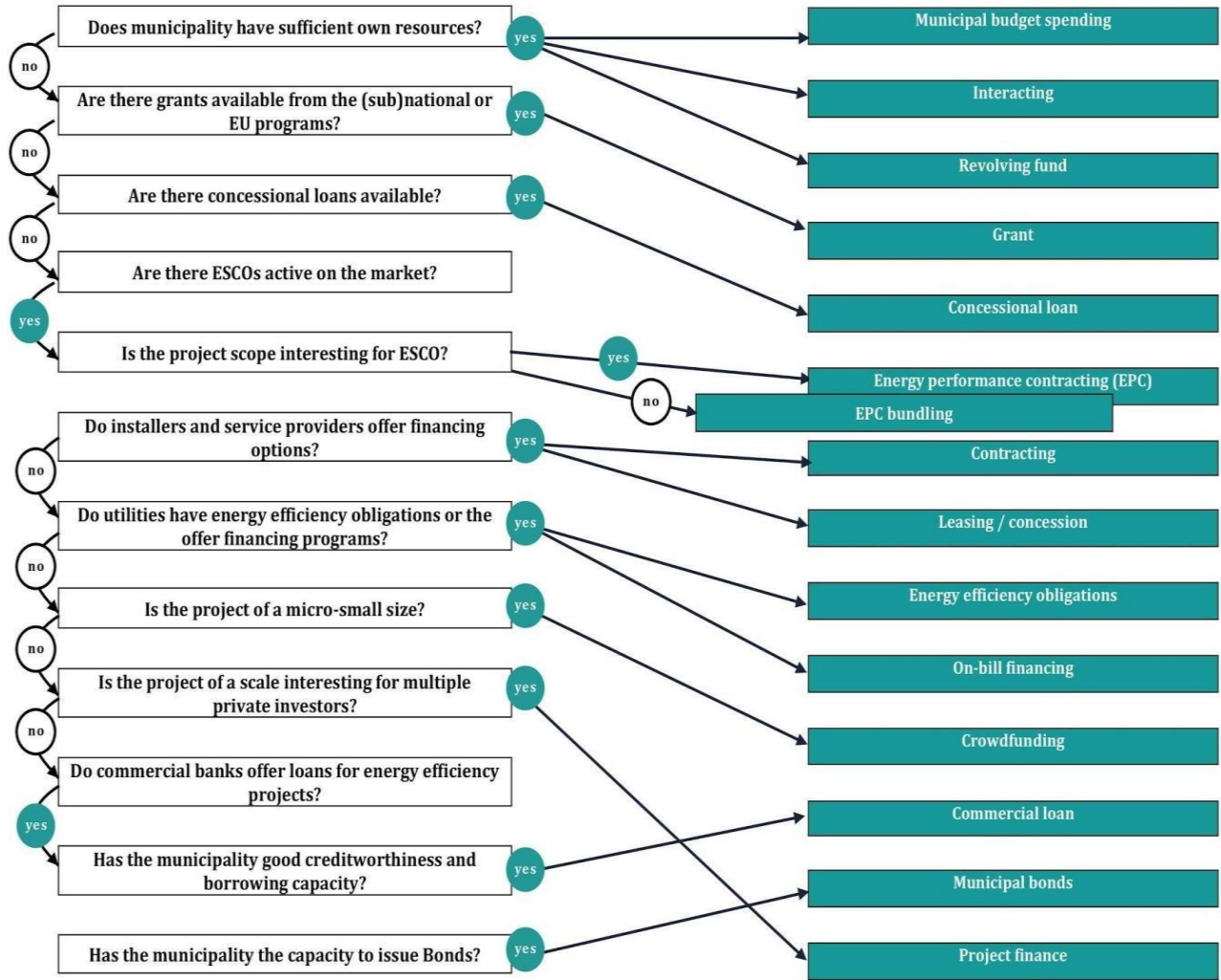
The decision tree represents a flow chart of the most appropriate financing mechanisms to address specific situations faced by municipalities in financing energy efficiency (EE) projects. The scheme is not binding as, in many cases, multiple mechanisms may be combined.

The first thing to address is whether the municipality has sufficient resources to fund the project(s) or not. If the municipality has sufficient financing for the project(s), it can allocate part of its budget for the project(s); by establishing a budget line item for a project and carrying out the mechanism of general budget financing. If the municipality does not have enough funds, it should seek any grants available from donors. If there are available grants, the municipality should apply for them. Often these grants do not cover the entire project cost as they represent a mechanism of partial budget financing. It is often possible that funds may also come from the national government; in this case, the municipality will capture a new budget for financing part of the project(s). If the fund does not come from the national government, it is possible to look for energy efficiency funds; this financing scheme is subject to EE fund eligibility criteria.

Beside these funds, commercial banks can also offer dedicated credit lines and/or risk-sharing programmes. In order to take advantage of these opportunities, the municipality must respond for its creditworthiness as well as its collateral and borrowing capacity.

Other financing systems can be found in commercial or financial ESCOs; if there are ESCOs in the market the municipality should develop favourable EPCs by negotiating them with ESCOs. If the ESCO is not an option, leasing or vendor financing programmes can be searched. In such a case, when the eligibility criteria are satisfied, similarly to the commercial financing scheme, the municipality should negotiate the leasing or the vendor financing agreement. Finally, if the municipality has the capacity to issue municipal bonds it should create a municipal bond programme by taking into account the transaction costs and market situations.

Select the relevant financing model for sustainable energy and climate action projects using a simple decision tree below:



Source: Novikova, et al., 2017

Figure 2: Decision Tree

Innovative Financing Schemes

Innovative financing schemes are non-traditional ways of raising funds and facilitating sustainable energy and climate investments for cities and regions by mixing different sources (own fund, public and private funds) or engaging different partners (e.g. citizens, private sector) aside from established financial institutions (e.g. banks). Considering the frequency of best practices assessed by PROSPECT (and available on Deliverable 2.2 Best Practices Report), this module will focus on a revolving fund, soft loans, and guarantee funds as common innovative financing schemes.

Table 5: Innovative financing schemes under private buildings

Financial Schemes	
Guarantee Funds	Loan guarantees provide a buffer by first losses of non-payment. Mechanisms whereby public funding facilitates/triggers investments.
Energy Performance Contracting (EPC)	Energy Performance Contracting (EPC) is a method to implement energy efficiency projects, by which an ESCO (Energy Services Company) acts as a unique contractor and assures all of the steps of a project, from audit through installation up to operations and maintenance. The ESCO delivers a performance guarantee on the energy savings and takes responsibility for the end result. The EPC contract is the contractual agreement by which the output-drive results are agreed upon.
Third-party Financing	Refers solely to debt financing. The project financing comes from a third party, usually a financial institution or any other investor, or the ESCO, which is not the user or customer.
Soft Loans	Soft loan schemes are loans below-market rates and with longer payback periods. Soft loans may provide interest-free periods at the beginning of the loan. It is a mechanism whereby public funding facilitates/triggers investments.
Revolving Funds	A fund established to finance a continuing cycle of investments through initial amounts received from its shareholders, creditors or donors and later on through amounts received from reimbursements of provided funding or loans to projects. These recovered funds become available for further reinvestment in other projects under similar scope (e.g. revolving funds for sustainable energy will use the loans recovered funds to finance new sustainable energy projects).

Guarantee Funds

What you need to know about guarantee funds



What are guarantee funds?

One of the most commonly used financing tools to facilitate private investments in energy efficiency projects are guarantee funds. Guarantee funds enable the engagement of financial institutions and allow sharing of credit risk or distribution of loss in energy efficiency investments. Guarantee funds are a way of transferring credit risk from a creditor to another entity (guarantor) that is capable and ready to deal with part of the risk and/or cover the loss (ESMAP, 2014).

To illustrate, loans are provided to the debtor (or borrower) by a commercial lender (or financier). However, should the loans default or if the debtor fails to meet the conditions of the loan and is unable to pay the lender, another entity – the guarantor – absorbs the credit risk and/or covers the loss. Guarantee funds are different from debt financing as in the latter, direct loans, including the interest charged, are paid back over time by the debtor. However, debt financing, such as soft loans, and guarantee funds can complement each other.

Guarantee funds, along with first-loss facilities, are classified under risk-sharing facilities which cover the risk in case of payment default and if necessary, offer additional funding. The first-loss can be absorbed by a guarantor, lowering the risk, so banks and equity investors are more willing to invest (Energy Efficiency Financial Institutions Group or EEFIG, 2014). Guarantee funds are also known as credit and/or risk guarantees and sometimes guarantee payments or programmes.

Why are guarantee funds important?

As commercial lenders may perceive it risky to invest in energy efficiency projects for reasons, such as long payback periods or high perceived risk exposure, the use of guarantee funds may address the wariness of investors, enable them to accept the risk of debt lending, and improve their confidence in investing. However, to facilitate private sector investments, guarantee funds sponsored by public authorities should address commercial and non-commercial (e.g. financial stability, policy changes) risks. Guarantee funds are a signal to financial institutions that projects, such as in energy efficiency, are worth lending to not just for commercial but also for social reasons (Association of Conservation of Energy or ACE, 2013).

Guarantees provided by public authorities, such as Estonia's KredEx and German KfW, can create a 'breathing space' which, according to the ACE (2013), is a condition in which energy efficiency investments have an opportunity to demonstrate good performance so that they seem promising and a guarantee is no longer necessary. Successful guarantee schemes for energy efficiency investments can then increase bank involvement in financing (Makinson, 2006).

However, according to the Association of Conservation of Energy, a consideration in assessing whether guarantee funds are a success is the extent to which these guarantee funds remain necessary. Investors, in the long run, may no longer find the need for guarantee funds should energy efficiency projects become more familiar, credible, and mainstream. The current economic condition, the increased reluctance to give on loans across all sectors, and the less fruitful investments may be the reasons public sector guarantee funds are still essential in Estonia and Germany (ACE, 2013). Guarantee funds are then meant as temporary interventions by the public sector to enable private investments and gain the trust of commercial lenders (FEDARENE, 2015).

For which energy projects can guarantee funds be used?

Guarantee funds are intended for large infrastructure projects. However, these have wider applications (United Nations Environment Programme, 2004). Risk-sharing facilities, such as guarantee funds, have been used in energy efficiency projects in public and private buildings whether these are commercial buildings, public rental and private rental buildings, and owner-occupied housing (EEFIG, 2014). In Bulgaria, the Energy Efficiency and Renewable Sources Fund (EERSF), which include guarantee funds, can be used for energy efficiency enhancements by municipalities, corporations, and private individuals in industrial processes, renewable energy sources (RES) projects targeting end-user consumption, retrofitting of building, improvements of heat sources and distribution systems, and street lighting. Having supported many projects in various sectors including the private buildings sector, guarantee funds have proved themselves as a versatile financing mechanism.

However, guarantee funds are not meant as stand-alone solutions and are not applicable for all market situations (Makinson, 2006). Based on reported experiences, young firms in energy efficiency, especially energy service companies or ESCOs, typically need guarantee funds in addition to public support instruments for debt financing, to secure the capital needed (Makinson, 2006). In general, all types of risk-sharing facilities, like guarantee funds, can be combined with

dedicated credit lines or soft loans (EEFIG, 2014). For example, KredEx's energy efficiency schemes for the residential sector in Estonia are supported by loans, grants, and guarantees (ACE, 2013). According to the Conservation of Energy, this combination of different funding sources, such as in Estonia, and their accompanying interest rate and duration of the loan are more encouraging than market loans.

Are there different types of guarantee funds?

There are different types of guarantee funds available: public guarantee schemes, corporate guarantee schemes, international schemes, and mutual guarantee schemes. Public guarantee schemes are usually established by public policies, involve state subsidies, and are managed by private organisations or administrative government units (OECD, 2008). In case of loan default, the guarantees are paid from the government budget. An advantage of public guarantees is that this has higher credibility in the banking sector (OECD, 2008).

On the other hand, corporate guarantee schemes are funded by the private sector, such as banks, and are managed by corporate leaders. International schemes are usually provided through bilateral or multilateral agreements between governments or non-government organisations. Oftentimes, however, these international schemes incorporate guarantee funds and technical assistance to firms (OECD, 2008). Mutual guarantee schemes, which are also known as mutual guarantee associations, societies, or funds, are formed by private, independent organisations. Funded by membership fees and sometimes from government support, these are managed by borrowers who have limited access to bank loans.

According to FEDARENE, [The Revolving Retrofit Guarantee Fund](https://fedarene.org/publication/brochure-on-innovative-financing-schemes-in-local-and-regional-energy-efficiency-policies/) is an example of the credit risk guarantee approach. "Guarantee mechanisms aim at engaging financial institutions by supporting and sharing the credit risk of the energy efficiency investments. The guarantee makes financiers accept the risk for debt lending and act as a catalyst to scale up private investment in energy efficiency. However it is important to understand that guarantee mechanisms are an essential complement to other financing approaches, in order to fill the financial gaps encountered by early stage energy efficiency projects²¹. Guarantee funds may be used as a temporary public sector intervention in order to demonstrate to the financiers that loans are being repaid successfully, thus on the long run gaining their trust. Such instruments are urgently needed in developing countries, where the guarantees must cover a very large amount of the loan, sometimes up to 150% (as opposed to most energy efficiency guarantee programmes in Europe that typically provide 50% guarantee)." (<https://fedarene.org/publication/brochure-on-innovative-financing-schemes-in-local-and-regional-energy-efficiency-policies/>)

How are these public guarantee funds structured?

In Bulgaria, partial credit guarantees and portfolio guarantees are offered to private individuals, companies, or municipalities. Under partial guarantees, there are two options: 80% on a pari passu basis or 50% on a first loss basis after the bank creditor. Individual or per project guarantee commitments is up to BGN 800, 000 (EERSF, 2018).

Portfolio guarantees are classified into two: the ESCO portfolio guarantee which is designed to

attract more ESCO companies and make them comfortable guaranteeing the risk of project beneficiaries and the residential portfolio guarantee which is meant to kick start the market of EE investments in the residential sector by providing market products that overcome the lack of legislation the country (EERSF, 2018).

ESCO portfolio guarantees

ESCOs commonly depend on debt financing to fund a project. Consequently, they also rely on the client's payment to pay back their own debt. If the client fails to pay in time, it will cause a delay in the ESCO's debt service performance. EERSF offers an ESCO portfolio guarantee to cover such issues in the cash flow of the ESCO and absorb some of the risk of the ESCO. The following provides further detail:

- EERSF signs a framework agreement with the ESCO to issue a portfolio guarantee for a preapproved portfolio of projects;
- The ESCO wins a tender for an energy efficiency project;
- EERSF approves the project and adds it to the portfolio of approved projects;
- EERSF guarantees that it will cover up to 5% (the percentage is negotiable) of the defaults of the delayed payments of this portfolio;
- With this guarantee, the ESCO gets better interest rates on its debt with commercial banks and has a piece of mind that there is 5% failsafe trigger that will prevent cash flow disruptions and will reduce the risk of the clients.

The 5% of the investment can cover the delayed payments made by the client because generally the amount of the client's payment per month is much lower. Cases of delayed payments are more likely to happen and EERSF can act as a financial buffer to assume the risks. Besides, such product gives a great advantage to EERSF's own funds. For example, EERSF provides a guarantee of BGN 500 000 to aid a portfolio of investments worth BGN 10 million.

Source: [EERSE](#)

ESCO Application

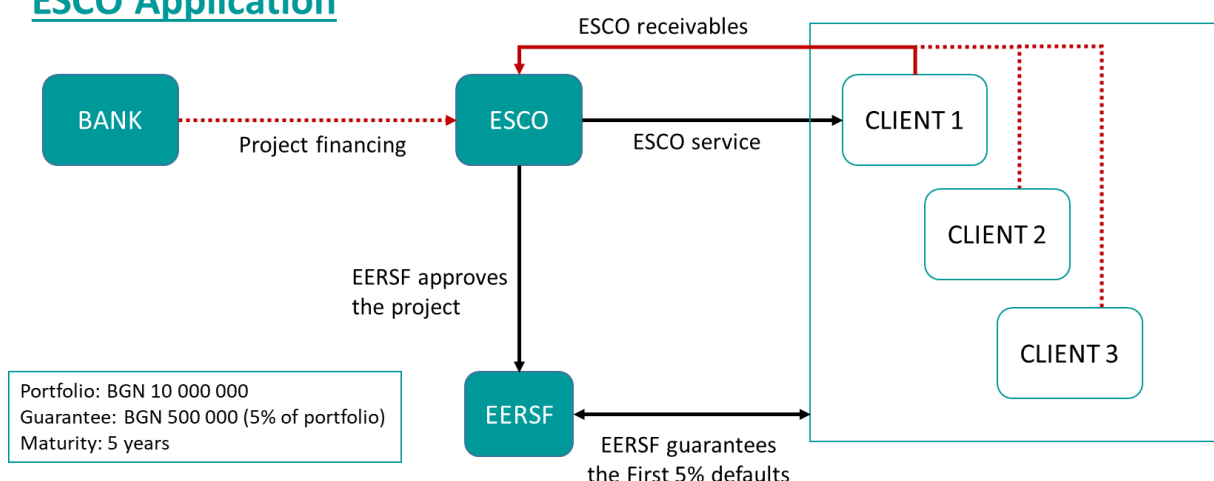


Figure 3: ESCO Portfolio Guarantees. Source: EERSF

Residential portfolio guarantees

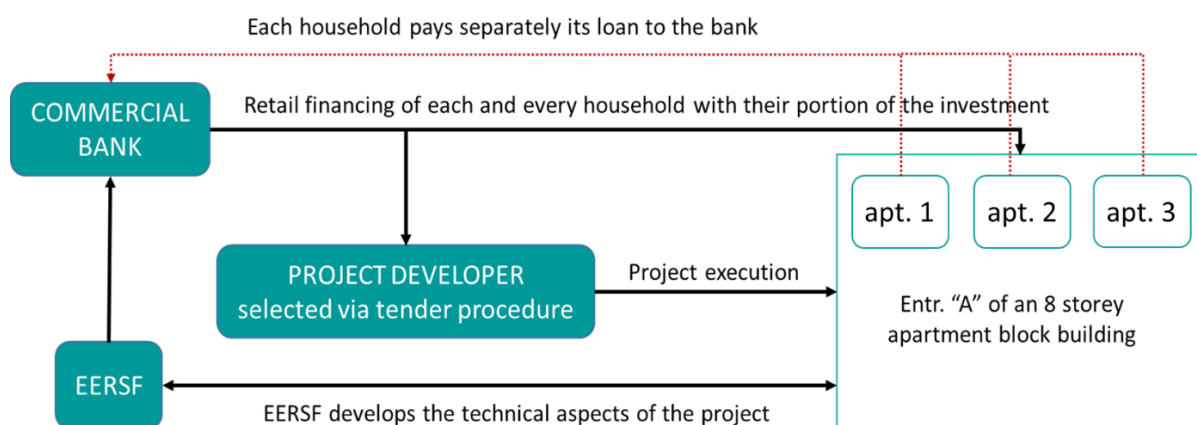
EERSF offers the residents in a building to invest in an energy efficiency project and find a first class company to execute it. The project gets a bank loan, but each household in the building will be responsible to pay back the loan according to their own built-up area. This concept is known as residential portfolio guarantee.

The first 5% of defaults within this block (or portfolio of blocks) will be assumed by EERSF. Default is simply when the customer fails to repay the loan. The default rates are commonly up to 3%, so the guarantee from EERSF is enough to assume the entire risk of the commercial bank. Together in a partnership, EERSF and commercial banks are developing this guarantee product. EERSF acts as an intermediary between the commercial banks and the residents to run an energy efficiency project, as there are no household associations in Bulgaria coupled with inadequate energy performance regulations.

Source: [EERSF](#)

Application with Commercial Banks

Portfolio: BGN 10 000 000
 Guarantee: BGN 500 000 (5% of portfolio)
 Maturity: 5 years



EERSF guarantees the first 5% defaults.

Statistically the % of the defaults in retail banking is less than 1% (Raiffeisenbank) to about 3%. EERSF will choose for partner banks with relatively low default rates (less than 5%).

Figure 4: Residential Portfolio Guarantees. Source: EERSF

Other guarantee fund structures in general, especially for small enterprises, can be found in [this thesis](https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1003&context=arch_crp_theses) (https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1003&context=arch_crp_theses) along with the tools for choosing the right guarantee fund structure that will best fit certain situations.

How do exactly guarantee funds work?

Guarantee funds have a covered and uncovered part of the loan. The covered part of the loan is allocated to the guarantor while the uncovered part of the loan is allocated to the lender (ESMAP, 2014).

Guarantee funds may cover all risks no matter the cause. However, a partial risk guarantee may only cover losses in certain cases. Guarantees usually do not cover all risks to encourage the lenders to investigate their customer's creditworthiness. Guarantees may provide access to bank loans for energy efficiency projects (ESMAP, 2014).

The debt recovery process starts once there is a loan default. The loan can be recovered from a guarantee fund which can allow for up to the maximum amount it contains (FEDARENE, 2015). Further, when this guaranteed scheme is incorporated with a preferable loan mechanism, the loan would be more likely accessible at reduced prices as the guarantee lowers the creditor's risk. In Europe, according to Makinson (2006), most guarantee funds for energy efficiency investment typically provide 50% guarantees.

How can guarantee funds be priced?

It is very important to address correct pricing for guarantee funds. The price should be low enough, so the borrowers can easily access the guarantee funds, yet high enough to make the banks realize afterwards that using a guarantee is unnecessary as the energy efficiency projects are promising. In fact, guarantee funds are overpriced. Without these considerations on the cost of guarantee funds, banks will rely heavily on guarantee funds and it will be hard to abolish (Makinson, 2006).

What are the advantages of guarantee funds?

Guarantee funds enable leveraging of public funds and ease the perception of risk among commercial lenders for energy efficiency projects (ESMAP, 2014). Furthermore, these funds reduce the risks for financial institutions, such as banks, and enable them to lend greater amounts and provide extra leverage for private sector funds (EEFIG, 2014). Also, according to EEFIG (2014), risk-sharing facilities, like guarantee funds, can be a temporary medium to help finance energy efficiency projects until they are recognised to have better credit performance, therefore loans for energy efficiency projects are more widely available later on. If the customers can succeed in paying back the loan with the support of public sector guarantees, the banks will consider energy efficiency as a real bargain on their lists (Makinson, 2006).

What are the limitations of guarantee funds?

Fedarene identified the main barriers and limitations of guarantee funds in their [Brochure on Innovative Financing Schemes \(2025\)](#):

- Moral hazard if all risks are removed.
- Extensive and complex handling of risk-sharing facilities.
- In case of replication, it is essential to understand that the ability to attract investment will depend on the financial climate of each country and of the availability of other schemes.
- It is difficult to gauge in advance what the take up might be – even with the best market research, things can change, or small details can affect results. For this reason it is crucial
- to design an approach that can flex as you learn more, and to build in a system to accept and respond to feedback from homeowners, advisers and installers.

What are the market conditions required for guarantee funds?

The market conditions necessary for guarantee funds include good banking partners willing to lend/assume risks; municipalities must be marginally creditworthy and willing to borrow; municipalities able to retain energy cost savings and pay for energy based on consumption; and reasonable, competitive lending rates (ESMAP, 2014). According to Makinson (2006), a few times, guarantees are not befitting to be applied when the banks have insufficient liquidity, such as local banks where the Bulgarian BEERECL programme is partnered with to provide debt financing. In other cases, when the problem lies in other factors, such as unwillingness to take risks, it should be considered to use guarantees under a public financing scheme.

How can guarantee funds be rolled out at a larger scale?

According to EEFIG (2014), these are the necessary conditions to roll out guarantee funds at a larger scale:

- A template approach to execution of risk-sharing facilities using ESIF 2014-2020
- Consensus view as to at what stage and for what market segments this Financial Instrument is most useful and pressure by EU public financial institutions to develop faster in those identified segments and the Member States
- A greater degree of collaboration/ resource commitment on the design and implementation of these instruments by private and public sector Financial Institutions
- Further consideration of the role public guarantees might play in support of the energy efficiency services markets

According to FEDARENE (2015), it is essential to create a flexible approach that can be adaptable as time passes considering the uncertainties in the future. It is also important to maintain communication with homeowners, advisers, and installers through a good feedback system. Further, according to FEDARENE (2015), the financial conditions and the availability of other financing schemes in each country should be taken into account when drawing the attention from potential investors.

Mobilising commercial finance that is supported by the public sector can be a great tool for energy efficiency projects to access capital more easily and generate positive cash flow and cash position for ESCO. The lower the risk for the end-user, the more likely the project is considered a success. Therefore, risk-sharing facilities, like guarantees, can encourage private sectors to invest in energy efficiency as guarantees assume some of the risks, reducing the risk for the end-user (Makinson, 2006).

Who can lead and provide guarantee funds?

Public-sector funding with the aim of supporting wider private investments can lead to a risk-sharing facility (EEFIG, 2014). For energy efficiency projects in cities and municipalities, loan guarantees are usually provided by donors, while there are cases where these have been provided by or together with local – or even higher levels – of government to cover part of the loss (ESMAP, 2014). For example, KredEx had a total of €66.3 million in financial inputs and

leveraged funding. These funding came from the Council of Europe Development Bank (CEB) and European Union (EU) structural funds which provided €49 million while the Estonian government offered €17.3 million.

In Bulgaria, the EERSF, which was established through the Energy Efficiency Act (EEA) by the Bulgarian Parliament in 2004, received initial capital from the Global Environmental Facility through the International Bank of Reconstruction and Development and the World Bank with \$10 million, the Governments of Austria and Bulgaria with €1.5 million each, and private companies in Bulgaria (EERSF, 2018). EERSF serves multiple roles: as a lending institution, as a credit guarantee facility, and as a consulting company. It also offers technical and financial support, such as guarantees, for Bulgarian firms, municipalities and private individuals in energy efficiency project development. In 2013, the European Bank for Reconstruction and Development and the Bulgarian Ministry of Economy and Energy provided € 5M in grants to further finance partial credit guarantees for ESCO projects in public buildings (CITYinvest, 2015).

In Severn Wye, United Kingdom, **The Revolving Retrofit Guarantee Fund** was developed by the Hungarian consultancy Global Environmental Social Business (GESB). This finance mechanism makes loan finance more accessible by providing a low-cost guarantee. Severn Wye acknowledged the role of GESB to advance the loan financing in the UK by adjusting the approach of the Revolving Retrofit Guarantee Fund that was a success in Hungary (BUILD2LC Project, 2017). This involved developing a loan portfolio relevant to the housing stock and potential in the local area, establishing a guarantee fund and seeking investors to provide loans.

Severn Wye has been working with South Gloucestershire and Stroud District Councils to introduce loans to homeowners wanting to improve the energy efficiency of their homes. The loans are available for various energy efficiency improvements including renewable technologies and upgrading heating where suitable. Householders going through this scheme are also able to take advantage of any grants they may be eligible for through national schemes including the Energy Company Obligation funding or Green Deal. This scheme requires householders to use installers registered on the Link to Energy database.

Severn Wye and Global Environmental Social Business initially had to develop debt products adjusted to the housing units and to the possibility in the vicinity. Consequently, they also needed to attract investors to give on loans and seek a source of finance for the guarantee fund. There were several steps in the establishment of the pilot loan based on the project report (FEDARENE, 2015):

- **Collating and mapping local retrofit markets:** data on the housing stock and on the potential for measures in order to draw up the first portfolio of potential financiers.
- **Develop a draft prospectus:** including measures and estimates of costs and savings.
- **Identifying potential commercial partners:** GESB and Severn Wye compiled a list of potential commercial funders (banks) and spent several months contacting them to explain the programme (See “main barriers” Section below).
- **Establishing the Guarantee Fund:** four local authorities had supported the project from the start. Three of them agreed to put their own funds into a Guarantee Fund.
- **Establishing the loans pot:** identifying investors to provide loan capital proved unsuccessful. Therefore, a reduced pilot loan scheme was launched with funds from the two of the local authorities (South Gloucestershire and Stroud District Councils), and from supporting charities such as Sainsbury Family Charitable Trusts and Severn Wye’s own charity reserves.
- **Establishing legal agreements:** between the various parties involved.

- **Obtaining permissions, licences and verifying compliance with regulations:** financial service regulations for providing loans, consumer credit regulations for referring people for loans, and regulations regarding the correct presentation of information on promotional materials.
- **Agreeing on loan product details and processes:** loan duration, interest rates, fees, household eligibility, credit and affordability checking, and a clear map of the customer journey.
- **Promotion and marketing,** promotional materials, referral networks and marketing plans

A new initiative beyond the scope of the EU Green Deal hardly attracted most of the large financial institutions to commit at that moment during the phase of identifying potential commercial partners. The goal of the initiative was aligned with the three-year “Countdown to Low Carbon Homes” project’s, which was conducting a full pilot loan during the project. However, it was postponed until 2014 to launch the initiative due to the legal and financial hassles, not to mention the challenges faced when seeking finance. Hence, in case of replication, the financial conditions and the availability of other financing schemes in each country should be taken into account when drawing attention from potential investors.

Moreover, Severn Wye had never participated in a financial market until then. GESB offered a financial adviser and technical knowledge of establishing the Revolving Retrofit Guarantee Fund to support the project. Severn Wye benefitted from the GESB’s assistance as it saved time and even reduced their risk. This calls for specialist advice about loan mechanisms when the energy agency or organisation is inexperienced in the financial market, like Severn Wye.

It is worth noting that in this case, the loan pilot was a part of the Countdown to Low Carbon Homes project. Hence, the legal advice and support were not necessary at first nor was it included in the budget.

As the “Countdown to Low Carbon Homes” project was completed, Severn Wye needed to check if the payment for the work was made. Any charges quoted to the client need to comply with specific regulations, in which the annual percentage rate of charge (APR) and referrals are clearly specified. It is important to note that this challenge might be encountered by any energy companies who are willing to replicate this scheme, though it comes down to the availability of funds within the scope of work.

Source: [FEDARENE](#)

Who can apply for guarantee funds?

Guarantee funds can act as a means for end-users as well as energy service companies (ESCOs) to ease access to affordable debt financing (Makinson, 2006). In some cases, the customer can be the guarantor using the future savings on energy bills according to the project contract that can be paid monthly or quarterly within a few years. In this case, the customer must possess high creditworthiness and a strong balance sheet. The risk of this type of model comes from the failure of the energy efficiency projects resulting in the customer being unable to profit from energy savings. Therefore, Energy Performance Contracts (EPCs) act as a point of reference in energy efficiency projects, by which the ESCO plays a major role in the project, such as taking care of the operation and maintenance. Above all, the ESCO must guarantee the savings from energy bills, so it reduces the customer’s financial risk (Makinson, 2006).

Furthermore, in some circumstances, the ESCO assumes the risk and looks for the funding in this

model. In order to arrange more equitable risk allocation between contractual parties (the ESCO and the client), EPCs are getting more adaptable, especially in advanced markets. Energy efficiency projects that are funded through a lending platform will mostly need a guarantor. If the ESCO owns a solid balance sheet (backed by the equity) and other businesses with solid income statements, the ESCO may be exempt from a guarantee scheme (Makinson, 2006).

In Severn Wye, the United Kingdom, from the loan pilot project started until April 2015, there were 151 clients in Stroud and 196 clients in South Gloucestershire considering the loan. Unfortunately, only four loans have been processed further in South Gloucestershire and none in Stroud to date. The loan pilot projects are still in progress (FEDARENE, 2015).

How to apply for guarantee funds?

In Bulgaria, under the EERSF (2018), the procedures are as follows:

1. Detailed Energy Audit

A necessary condition for a successful application with the Energy Efficiency and Renewable Sources Fund is the presence of a detailed energy audit allowing for an energy analysis and choice of energy-saving measures.

2. Principal Eligibility Criteria

All energy efficiency projects approved and supported by the Bulgarian Energy Efficiency and Renewable Sources Fund (EERSF) should meet the following eligibility criteria:

- The project should involve the application of well-proven technology;
- The project cost should range between BGN 30 000 and BGN 3 000 000 although exceptions are possible if strongly justified;
- The equity contribution of the Project Developer should be at least 10%;
- The repayment period is up to 7 years.

3. The Project Cycle

- Project identification (Project Developer)
- Initial project screening (when necessary, EERSF/external consultancy company)
- Completion of Initial Project Proposal (IPP) (Project Developer)
- Submission of IPP and accompanying documents to EERSF (Project Developer)
- Assistance in IPP and accompanying documents completion and improvement (EERSF)
- Project appraisal and assessment (EERSF)
- The formal decision for approval of EERS financing (EERSF)
- Completion of negotiations for financing and disbursement of funds

Note: The normal period for project appraisal is 6 weeks, provided that the Project Developer manages to submit well on time all necessary documents, accompanying the IPP.

When can guarantee funds be used?

When corporates or private individuals decide to invest in energy efficiency projects but want to keep financial stability with adequate income streams, they tend to turn to debt financing provided by commercial banks. However, small-medium enterprises (SMEs) and private

individuals (such as homeowners) with low to medium income are most likely unqualified to get a loan from commercial banks (Deelen & Molenaar, 2004). Commercial banks provide dedicated credit lines with risk-sharing programmes only if the potential borrower has good borrowing capacity, collateral, and creditworthiness (ESMAP, 2014).

Banks consider collateral important as it indicates the client's commitment to pay back the debt. Besides, collateral can help compensate for loan default through the sale of seized collateral. To determine how good a collateral is according to banks, ask the following questions (Deelen & Molenaar, 2004):

- Is the ownership easy to verify?
- Is it easily and cheaply seized?
- Is it irremovable?
- Is it inexpensive to convert it into cash or any other desirable asset?
- If it consists of movable assets, is it relatively cheap to store or manage?
- Does its value remain relatively stable over time?
- If it has a low monetary value, does it have a high and stable personal value to the borrower?

If all the answers to the questions are unequivocally “yes”, then the collateral may be quite passable for a bank. However, SMEs and private individuals with low to medium income will often have a hard time giving “yes” answers to all questions, except the last one. When they are unable to provide adequate collateral, guarantee funds can be used. However, guarantee funds are not meant for weak entrepreneurs and banks that underperform. There are four Ps needed for successful guarantee schemes (Deelen & Molenaar, 2004):

1. Well-prepared entrepreneurs
2. Good projects
3. Good performing banks
4. Professional bank staff who conduct an evaluation of the borrower

What have guarantee funds achieved?

Since launching, the EERSD Bulgaria fund has provided energy efficiency loans to 212 projects in total, with a project investment value of over USD 57.7 million (BGN 95.2 million). The fund has provided partial credit guarantees to 33 projects, for total project investments of USD 14.7 million (BGN 24.2 million). Using only USD 15 million of capital, the fund has catalyzed more than USD 72 million in energy efficiency investment in Bulgaria.

As of the end of Q2 2020, the investments financed or guaranteed by EERSF contributed to annual savings of over 130,000 MWh/year and 93,000 kt/year of CO₂eq (<https://econoler.com/en/projects/management-of-the-bulgarian-energy-efficiency-fund/>)

What are other guarantee funds set up in Europe?

KredEx

The Credit and Export Guarantee Fund KredEx was established in 2001 by the Estonian Ministry of Economic Affairs and Communication. The aim of KredEx is to support the financing of

corporates, reduce the debt risk related to export, and encourage new residential constructions and renovations that are based on energy efficiency in Estonia (BPIE, 2010). KredEx in partnership with most of the credit institutions in Estonia has arranged Housing Loan Guarantees. These guarantees allow certain eligible applicants to make a lower initial payment for buying new living properties or having existing ones renovated. These guarantees charge 3% of the guarantee amount to be paid once upfront. KredEx provides up to 24% of the value of the loan guarantee property, no more than €19,200.

The Housing Loan Guarantee is only for young families with a child of up to 15 years old, young professionals, and residents of restituted buildings. A young professional must be younger than 31 years old and has completed secondary or vocational secondary education, either employed or self-employed. A resident of restituted buildings is a person who has a tenancy agreement in a restituted building (returned to a former owner) as illegally expropriated property by means of ownership reform. This restitution is usually found in post-Soviet states.

There is another loan guarantee specifically for renovations called Apartment Building Loan Guarantee. The targets of this guarantee are apartments with low market prices and informal apartment communities, so that the borrower is not an independent legal person. For this guarantee, KredEx offers up to 75% of the loan amount. However, they charge yearly around 1.2 – 1.7% of the guarantee balance. The participating banks in this mechanism are Danske Bank, SEB, Swedbank, Nordea, Krediidipank, and Versobank.

There are two groups that are well-suited for The Apartment Building Loan Guarantee. The first group is apartment buildings that have a higher risk evaluated by the bank, so it is difficult to finance renovation through a bank loan. A high risk can be caused by a high share of borrowers, a high unit cost of investment per m² compared to the market rate, or the location of the apartment building that is in a mono-functional settlement or a below-market-rate area. The second group consists of apartment buildings that need a guarantor to cover the risk in case of payment difficulties. The loan guarantee requires the apartment association or the communities of apartment owners to be creditworthy. If these apartment associations would like to carry out a major reconstruction, KredEx also offers Reconstruction Grant for such cases.

The offered financing schemes (grants, loans, and guarantees) are exclusively for apartment buildings that have at least 2 (or in some cases, 3) apartments. Any apartments that belong to this group and meet the above criteria are eligible for the offered financing schemes, with the exception of the apartment loan scheme that requires apartments built prior to 1993.

The Kredex Fund is still ongoing in 2022.

Table 6: KredEx scheme costs and benefits

Financial inputs (and leveraged funding)	Financial returns (direct and indirect)	Take-up rate	Energy saving	CO2 impact (or greenhouse gas equivalent)
CEB loan and EU structural funds grant: €49 million; Estonian government: €17.3 million (2010-2011). Total: €66.3 million.	The small income from loan interest is returned to the revolving fund.	<p>Since 2000, 21,979 households have used the housing guarantee. 9.2% of housing loans issued in Estonia in 2011 had a KredEx guarantee.</p> <p>Since 2004, there have been 583 apartment loan guarantees (3.4% of apartment buildings)</p> <p>There have been 391 apartment loans since 2009 (2.3% of apartment buildings).</p> <p>By 2011, there have been grants to 266 apartment buildings (1.6% of apartment buildings). Also 1,038 smaller audit grants.</p>	<p>Apartment loans' average predicted energy saving is 39.3%.</p> <p>Expected saving from apartment loans and apartment grants is 75 GWh per year, expected saving over 20 years is 1,500 GWh (KredEx data)</p>	Expected savings translate into 0.077 Mt CO2 per year.

Source: Association for the Conservation of Energy (2013)

More information on the schemes offered by KredEx for [apartment associations](http://kredex.ee/en/apartment-association/) (<http://kredex.ee/en/apartment-association/>) and [housing](https://ieecp.sharepoint.com/sites/PROSPECTplus/Shared Documents/General/WP3 - IEACP developing the LP/T3.1 Developing P+ learning materials/Handbooks/Word versions/To review Diana/apartment associations (http://kredex.ee/en/apartment-association/)) ([https://ieecp.sharepoint.com/sites/PROSPECTplus/Shared Documents/General/WP3 - IEACP developing the LP/T3.1 Developing P+ learning materials/Handbooks/Word versions/To review Diana/apartment associations \(http://kredex.ee/en/apartment-association/\)](https://ieecp.sharepoint.com/sites/PROSPECTplus/Shared Documents/General/WP3 - IEACP developing the LP/T3.1 Developing P+ learning materials/Handbooks/Word versions/To review Diana/apartment associations (http://kredex.ee/en/apartment-association/))) can be found on their website.

FOGIME

The FOGIME was founded by the French development bank for SMEs (BDPME) and the French Agency for Environment and Energy Management (ADEME) in November 2000. It aims to be a loan guarantor for SMEs in energy sustainability investments. According to International Energy Agency (2012b), *“eligible investments include: high-performance production, use, recovery and energy storage equipment; energy-efficient modifications of production processes and renewables”*. FOGIME provides private sectors around 17.8 million euros in total to guarantee their loans up to 244 million euros. The SMEs that can benefit from this guarantee must have been established for more than 3 years with less than 500 m FF turnover and less than 500 staff headcounts. FOGIME can guarantee 70% of the loan in up to 15 years. This amount of loan guarantee is particularly higher than the average coverage rates for other SME projects insured by BDPME (IEA, 2012b).

Regional Investment and Guarantee Fund (Ile de France)

The Regional Guarantee Fund was set up in Centre Region, France via a partnership with OSEO, which is a public company that offers SMEs financing related to energy efficiency by means of credit and guarantee support. The Regional Guarantee Fund is also in support of very small enterprises (VSEs) that wish to undertake sustainable energy projects. The goal of the Regional Guarantee Fund is to assist VSEs and SMEs in their creation, growth, innovation, foreign investments and to provide new job opportunities. The Regional Guarantee Fund can guarantee 50% of the loan in cooperation with the local partner banks. As the local partner banks hand the

guarantee application to OSEO directly, the beneficiaries do not need to take further action. The following figure depicts how the financing scheme is implemented.

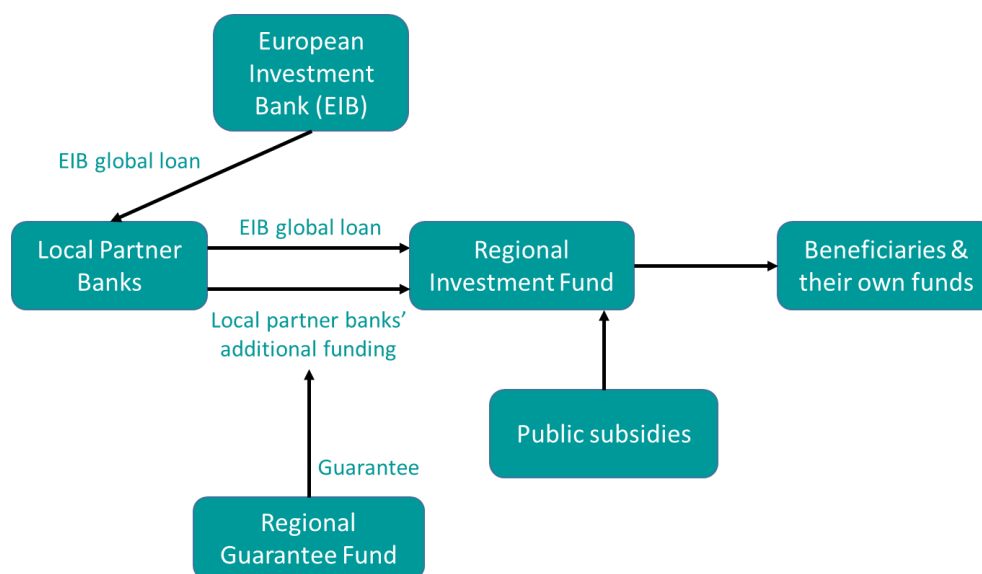


Figure 5: Business model of the Regional Guarantee Fund. Source: Energy Cities (2014)

What is the summary of guarantee funds?

Risk mitigation SMEs, such as loan guarantees, attracts more private investments in energy efficiency as it can lower the risks for the lenders, so they are less reluctant to give on loan. A loanguarantee scheme cannot be a stand-alone financing. Dedicated credit lines like soft loans are good pairs for guarantee funds. The following table presents an overview of risk mitigation programmes, including guarantee funds based on EEFIG (2014).

Table 7: Risk-sharing facilities (Guarantee funds and First-loss Facilities - Supply Drivers)

Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+		+	+	++
Led by:	Public sector funding with the aim of supporting wider private investments				
Advantages	<ul style="list-style-type: none"> ○ Reduces the risks for banks and enables them to lend greater amounts ○ Anecdotal evidence suggests that energy efficiency loans experience “market standard” or better credit performance therefore risk-sharing facilities can be a transition phase until energy efficiency loans are mainstreamed ○ Provides extra leverage for private sector funds 				
Weaknesses	<ul style="list-style-type: none"> ○ Time to structure and negotiate ○ Moral hazard if substantially all risk is removed from bank lending ○ Know-how to implement at regional and local government levels 				
Main obstacle/legal changes required	Often extensive and complex handling of risk-sharing facilities at the EU level (“red tape”) especially for smaller financial intermediaries and first-time users				

Best practice examples	<ul style="list-style-type: none"> ○ IFC's CEEF programme (Hungary, Czech Republic, Estonia, Latvia, Lithuania and Slovakia) ○ France's proposal to use the obligation from article 7 of EED to create a national guarantee fund for renovation loans ○ EERSF in Bulgaria ○ European Energy Efficiency Fund (EEEF)
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What are the key lessons learnt from guarantee funds?

The guarantee scheme is not a new thing in Europe. However, Estonian's credit guarantee agency, KredEx, presents alternative schemes that include energy efficiency projects, which was uncommon at that time. KredEx serves as a guideline for best practices of guarantee schemes as it has gained credibility with commercial banks in a short time. KredEx also makes it less complicated to manage a loan programme, especially with the possibility of less administrative fees. It also offers more opportunities for smaller buildings and apartments, especially vulnerable groups like big families and residents in restituted buildings² (ACE, 2013).

² ACE (2013) explained that restituted buildings are *"buildings that were confiscated under past regimes and then returned to previous owners. A tenant living in restituted premises is a person having a tenancy contract in living premises restituted (returned to a former owner) as unlawfully expropriated property through ownership reform. This restitution is a common issue in ex-Soviet states."*

However, there are several drawbacks of guarantee funds seen from KredEx case study. The end-beneficiaries are still mindful of taking the loan guarantee. This is represented by the lower take-up rate than it was hoped for. This might be due to additional required documents such as energy audits and building design documents. Another major drawback is that the complex reporting system makes it unattractive to beneficiaries. It can be quite cumbersome, as banks report to KredEx, and KredEx then reports to the Ministry and CEB (Council of Europe Development Bank), and then the Ministry must report to the EC (ACE, 2013).

The following lessons learnt are taken from the KredEx case study in Estonia based on the Association for the Conservation of Energy (2013).

- Preparation takes a long time – for Estonia, it was 2 years;
- A legal framework is needed to support measures; KredEx benefitted from a 2001 Government directive giving it a permit to grant state aid and a new law (Enterprise Support and State Guarantees for Loans Act, from 2003) meaning that KredEx's loan guarantees are counter-guaranteed by the State. Before that banks had no guarantee against the bankruptcy of KredEx.
- Combining different measures is beneficial
- An all-round approach - awareness raising, promotion, state and local support, legal and financial framework

Main lessons learnt from the [“Countdown to Low Carbon Homes”](#):

From the launch of the scheme to the end of April 2015, the loan was discussed with 151 clients in Stroud and 196 clients in South Gloucestershire. Four loans have gone ahead in South Gloucestershire and to date, unfortunately no loans have gone ahead in Stroud. The loan pilot projects are on-going.

Replication difficulties

At the identification stage of potential commercial partners, most of the large finance companies, including banks which were approached, were unwilling to commit to a new initiative outside the Green Deal at that time. Even though the aim was to run a full pilot loan during the three year “Countdown to Low Carbon Homes” project, the difficulties in raising funds and developing legal and financial processes delayed the launch until 2014. Therefore, in case of replication, it is essential to understand that the ability to attract investment will depend on the financial climate of each country and of the availability of other schemes.

Furthermore, working within a financial market has been a new area of development for Severn Wye. GESB provided expert advice on the financial aspects of the project and also information on setting up the Revolving Retrofit Guarantee Fund. Without this advice it would have taken longer and potentially posed a greater risk for Severn Wye. Therefore, if not an established provider of financial service (i.e. an energy advice organisation), specialist advice regarding loan schemes is needed.

It is important to pay attention to the context in which this financing scheme is implemented. In this case, the loan pilot was developed as part of the Countdown to Low Carbon Homes project and evolved as this project progressed. Therefore, the legal advice and support was not initially needed nor was it budgeted for.

When the “Countdown to Low Carbon Homes” project ended, Severn Wye had to ensure it received funding for the work on the project. Any charges made to the client need to conform to specific regulations, regulations that also prescribe how the annual percentage rate of charge (APR) is affected and how referrals are made. Therefore, depending on the funding availability of this area of work, energy agencies looking to replicate this scheme might also

have this challenge.

Implementation barriers

The expertise to set up a loan agreement between Severn Wye and the other finance providers was one of the main barriers. This was in part because neither of the partners had experience in setting up legal agreements to facilitate this kind of working relationship.

Other barriers included:

- establishing the APR of the loan,
- setting up the client journey,
- ensuring the legal responsibilities through the Consumer Credit Act were met.

Becoming authorised under the Consumer Credit Act was indeed a significant task. The Consumer Credit Act regulates financial activity in the United Kingdom and as clients would be directed to organisations that could provide credit, a credit brokerage licence was required. Interpreting the regulations without any previous experience of working within this market was challenging and time consuming. Institutions that can provide the appropriate expertise are very costly.

Soft Loans

What you need to know about soft loans



What are soft loans?

A soft loan is a financing scheme for energy efficiency projects that allows the loan interest rate to be reduced below the market interest rate and may even provide zero-interest rates at the beginning of the loan agreement (ACE, 2013; EEFIG, 2014; FEDARENE, 2015). Soft loans may also grant concessions, such as longer repayment periods, with certain conditions to meet (EEFIG, 2014; FEDARENE, 2015). Soft loans are versatile in all types of buildings.

Soft loans are commonly offered by governments, both in the form of tenders and direct negotiations, to be more fitting to customers' needs, thus sometimes are called preferential loans or dedicated credit lines. With longer maturity provided by soft loans, homeowners who take the loan for energy efficient-renovation work in their homes can adjust the monthly instalments based on their financial conditions coupled with the savings on energy bills (Energy Cities, 2017a). A lot of public international financing institutions and national governments are trying out the loan programmes to trigger the market and close the lending gap left by the passive local and traditional banking sector actors (Makinson, 2006).

Soft loans alone are oftentimes not sufficient to finance energy efficiency projects. Grants and subsidies are complementary to attract more customers and make the projects, even more, cost-effective. These grants are usually designed for certain groups that are vulnerable or hard to approach and are most likely unable to access the loan scheme. This expresses the need for improvement in the energy efficiency market, which normally requires high investments (BPIE, 2010). It can trigger market development, especially for small energy efficiency companies and ESCOs in under-developed markets (ACE, 2013). In the US, it has been proven that soft loans have helped many smaller residential and commercial energy efficiency projects to be carried out (Makinson, 2006).

Why are soft loans important?

Many countries give incentives to homeowners and enterprises who wish to conduct energy renovation work of buildings, such as subsidies from local to national governments and tax credits. Commercial banks provide consumer loans and mortgages. However, such financing schemes are mostly not adequate or suitable, especially for SMEs and homeowners with low to medium income. According to the [CITYinvest study](http://www.cityinvest.eu/tags/study) (<http://www.cityinvest.eu/tags/study>) in 2015, energy renovation work is very expensive with a range of investment between €200 and €1200 per m³. Therefore, existing financing schemes are often not sufficient to finance energy efficiency projects.

Subsidies, for example, are not designed to pay the whole investment costs. In most subsidy schemes related to renovation, most eligible measures must be able to demonstrate energy upgrades or savings. Quite a few subsidies can only be used for certain energy renovation works that are predefined. On top of that, these subsidies can only be reimbursed once the renovation work is finished and paid for. The initial costs are the most common obstacle for SMEs and homeowners with low to medium income.

Consumer loans are too pricey due to the high-interest rates and short maturity periods, in which the loan should be repaid within a short period of time. Whereas the payback from the energy renovation work takes up to 15 – 20 years and even more, especially the payback from deep renovation work.

Mortgages, however, are more attractive because they can secure long-term finance (20 – 30 years). The main issue here is that mortgages usually charge high admin fees. Moreover, when purchasing the property, the renovation work has to be planned in order to be taken into account in the mortgage.

When enterprises and homeowners conduct energy renovation work financed by a loan, they will pay less for their energy consumption, therefore they will be able to perform the debt service better. However, it is not acknowledged by financing institutions when they assess how creditworthy the potential customer is. They are unwilling to take on the risk of giving on loans

to vulnerable groups, such as low and very low-income households and SMEs.

These issues can be overcome by soft loans (combined with other financing schemes). With soft loans, the vulnerable groups can access financing sources that fit their needs, investment capacity, and ability to perform debt service. Further, soft loans can help develop the local energy renovation market and provide new job opportunities. This is proven by the Picardie region (France) within the framework 2007 – 2010, where the government made an investment in a soft loan scheme. With the investment of fewer than 9 million euros, the scheme ended up encouraging energy renovation work worth approximately 90 million euros and providing 330 jobs in the local building sector. The loan scheme was offered with zero interest rate coupled with grants and technical advice (Energy Cities, 2017a).

How do soft loans work exactly?

In the private residential sector, a soft loan acts as an incentive for homeowners. The idea is that homeowners who wish to conduct energy-efficient refurbishment work in their homes can finance the work through debt-financing with an interest rate below the market conditions. The following diagram simply displays how European Bank for Reconstruction and Development (EBRD) or other international financing institutions commonly offer a soft loan in an energy efficiency investment.

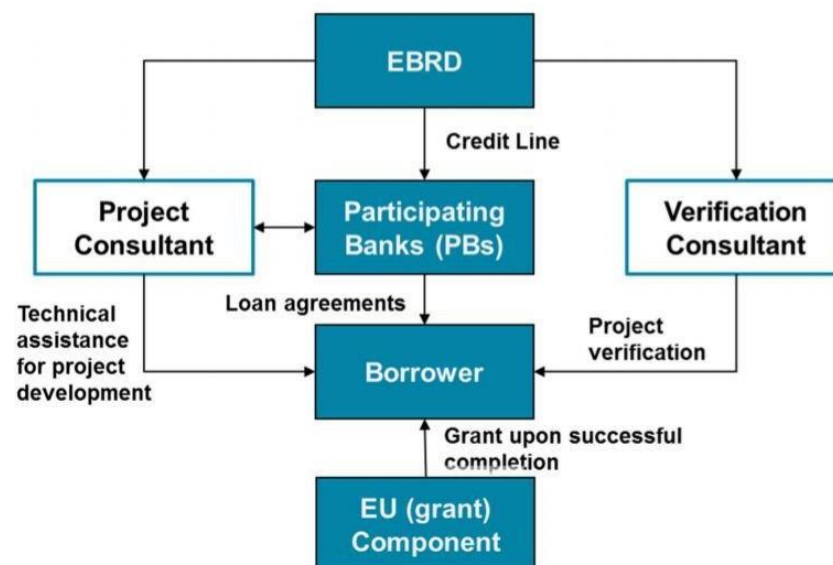


Figure 6: Typical soft loan provided by EBRD. Source: KANTOR Management Consultants Consortium, 2017.

In Frederikshavn, Denmark, and Bordeaux Metropole, France, soft loans are offered by banks. The banks evaluate the homeowner’s creditworthiness to decide if the homeowner is qualified for the soft loan. The local government does not financially support the scheme, nor does it assume any risks. However, the local government successfully convinced the banks to form partnerships in the energy renovation of the city’s residential buildings. It led to development of a new product by the bank partners: soft loans. The banks’ motivations include a new business area development, homeowners’ passive capital mobilization, and an increase in banks’ market value through their clients’ properties.

- Easy to roll out, however careful ex-ante analysis of supply and demand and legal/tax framework needed
- Standardised supply offering at the same time flexibility according to individual preferences (repayment, interest rate fixation, etc.)
- Can be used for ambitious renovation/refurbishing projects as well as for individual measures: large flexibility
- The use of cohesion funds for soft loans in housing is facilitated with the “renovation loan” (off-the-shelf instrument)
- Allows raising the ambition of the investment in terms of energy savings (e.g. by combining the loan with a grant component)

What are the weaknesses of soft loans?

According to BPIE (2010), EEFIG (2014), ESMAP (2014), and KFW (2011), the weaknesses of a soft loan scheme are as follow:

- Serves only creditworthy clients
- May be insufficient to attract investment
- Capacity/willingness of owners to take more debt (i.e. very country dependent)
- Risk aversion of banks (calling for guarantees from Governments)
- Often complicated, time-consuming and static application processes act as a hurdle for projects
- Loans often require the additional implementation of costly non-energy related measures which change project characteristics
- Requires strong and willing bank partners to develop a project pipeline

What are the main barriers to soft loans?

According to EEFIG (2014), Energy Cities (2017), and FEDARENE (2015), the main barriers to a soft loan scheme are as follow:

- The energy refurbishment process is unclear (i.e. what measures can be taken, what these will cost, and whether or not the refurbishment will pay the investment back)
- Transaction costs to implement (technically) and manage long-term programmes within financing institutions
- Increased regulations/provisions for (promotional) banks hinder commitments of credit lines (EBA-supervisory, State-Aid rules, etc.)
- Specific procedures must be followed to select the partners (time-consuming, strictly supervised, etc.)
- Awareness of homeowners or corporates who are not convinced that investing in energy-saving measures is profitable
- Other households' or firms' investments take priority over energy efficiency investments

- Market actors (e.g. construction companies, craftsmen, real estate agencies, financing institutions, consultants, and energy auditors) are not coordinated and do not offer easy, global and guaranteed energy saving solutions

What are the market conditions required for soft loans?

The market conditions necessary for soft loans include good banking partners willing to lend/assume risks; potential clients must be marginally creditworthy and willing to borrow; clients able to retain energy cost savings and pay for energy based on consumption; reasonable, competitive lending rates; reasonable tenors and collateral requirements. Corporates or homeowners with weak and/or limited or no borrowing capacity are usually not eligible to take on soft loans (ESMAP, 2014).

The conditions below are examples of the existing standard market conditions set by banks for households wishing to take on a soft loan for energy refurbishment works in Frederikshavn, Denmark, as of November 2016.

Table 8: Loan conditions offered by partner banks to households in Frederikshavn

Bank	Loan conditions
COOP Bank	<ul style="list-style-type: none"> ○ Loan amount: 10,000 DKK (€1,350) - 80,000 DKK (€10,000) ○ Interest rate: 0% ○ Maturity: max 5 years ○ Grace period: 0 month ○ Low-income homeowners are encouraged to implement energy renovation in several steps. Once the first measure is implemented and paid for through energy savings, the homeowner starts another measure. This model gradually improves the homeowner's creditworthiness as well as the value of the house.
Danske Bank	<ul style="list-style-type: none"> ○ Loan amount: variable, the theoretical framework between 20,000 and 200,000 DKK (€2,700- €27,000), but in practice, and in most cases about 200,000 DKK (€27,000). ○ Interest rate: 5.5 % - 13.6 % or less (variable, depending on creditworthiness). The homeowner may choose a fixed rate for 10 years or a floating rate. ○ Maturity: An agreement between the bank and the customer. The loan can be redeemed at any time - a maximum repayment period of 30 years. ○ Grace period: individual agreements but recommended time is less than 6 months.
Nykredit Bank	<ul style="list-style-type: none"> ○ Loan amount: variable, typically between 50,000 and 300,000 DKK (€6,700-€40,300). ○ Interest rate: 3.3% - 10.0% (lowest interest rate for up to 60% of the house value, the highest rate for up to 100% of the house value) ○ Grace period: individual agreements but recommended time is less than 6 months.
Arbejder nes landsba nk	<ul style="list-style-type: none"> ○ Loan amount: two types of loan <ol style="list-style-type: none"> 1. Energy loan: up to 100,000 DKK (€13,500) with no requirement for a guarantee and 200,000 DKK (€27,000), with a requirement for a guarantee 2. Home loan: up to 250,000 DKK (€33,600). ○ Interest rate: <ol style="list-style-type: none"> 1. Energy loan: variable depending on creditworthiness. Typically 6.6 %, when a guarantee is required and 7.1% when a guarantee is not required. 2. Home loan: 4.7 % - 9.6 % (lowest interest rate for up to 60% of the house value, the highest rate for up to 100% of the house value) ○ Maturity: <ol style="list-style-type: none"> 1. Energy loan: up to 10 years 2. Home loan: up to 20 years ○ Grace period: up to 6 months.

How can soft loans be rolled out at a larger scale?

According to EFIG (2015), these are the necessary conditions to roll out soft loans at a larger scale:

- Comprehensive framework, e. g. including energy audits and independent expert advice
- Large network of on-lending banks and equal conditions for all
- Long term horizon and stability
- A set of criteria that can easily be understood, processed and checked Measurement, Reporting and Verification (MRV), possibly using software instruments.
- An effective information strategy directed towards the final beneficiaries.
- Greater involvement with Energy Performance Contract providers in selected subsectors.
-

Who can lead and provide soft loans?

The government financially supports a soft loan scheme to trigger capital investment, particularly to vulnerable groups in less-developed or high unemployment areas by promoting loans with below-market interest rates (CITYinvest, 2015). Soft loans are commonly a result of public-private partnerships where the government gives a financial aid to the bank, which leads to an attractive interest rate offered by the bank to its customers (ACE, 2013). National or international development banks (e.g. European Bank for Reconstruction and Development (EBRD) and EIB) commonly offer such dedicated credit lines and distribute them to designated markets through regional partner retail banks (Interreg, n.d.).

Who can apply for soft loans?

In the residential sector, soft loans may be accessed by individual residential or non-residential clients. A group of clients, such as an apartment community, may also be eligible to apply soft loans (ACE, 2013; FEDARENE, 2015). Households with low to medium income who are often not eligible for commercial loans can access a soft loan financing scheme. Households, especially the elderly, with very low and irregular incomes may be offered soft loans under certain circumstances (e.g. social housing) and often combined with subsidies (Energy Cities, 2017a).

Soft loans for energy-efficient homes can be offered in the form of mortgages, called preferential mortgages. Existing mortgages can be extended on better terms to offer clients an opportunity to pay for energy efficiency improvements. Soft loans may seem to be an efficient financing scheme for energy refurbishment of buildings, however, building owners need to obtain supplementary funds, not to mention additional debt financing. Many building owners are not willing or able to raise their debt ceiling for energy efficiency investments (ACE, 2013; FEDARENE, 2015).

The following table provides examples of the eligibility requirements for soft loans in the residential sector in several countries.

Table 9: Examples of eligibility criteria for soft loans in energy-efficient home investment. Source: EnergyCities, 2017a

City/Region	Type of housing	Type of households	Measures
Frederikshavn (DK)	<ul style="list-style-type: none"> ○ All types of housing in private ownership (not only buildings constructed before 1970) in the municipal area 	<ul style="list-style-type: none"> ○ No specific conditions regarding the households' income 	<ul style="list-style-type: none"> ○ Insulation of the building envelope ○ Electricity and heating systems ○ Ventilation and heat recovery ○ Renewable energy production technologies ○ Control and monitoring of energy devices ○ Other renovation work not directly related to energy efficiency improvement
Bordeaux Metropole (FR)	<ul style="list-style-type: none"> ○ All types of housing (single-family, apartments, condominiums) built before 1st January 1990 ○ The owner-occupied housing units are the main target, however, rented properties are also eligible 	<ul style="list-style-type: none"> ○ Households meeting the eligibility criteria of the national 0% Eco-loan ○ No specific conditions regarding the households' income 	<p>In the framework of the national 0% Eco-loan, at least two measures out of the list below must be implemented:</p> <ul style="list-style-type: none"> ○ Thermal insulation of roofs, walls, doors and windows; ○ Installation, regulation or replacement of heating systems connected or not to energy-efficient ventilation systems or hot water production; and ○ Installation of hot water production equipment using renewable energy sources. <p>All work has to be performed by certified professionals holding quality accreditation. Eligible costs also include energy audits, project management (e.g. architect fees), insurance, etc.</p> <p>In the context of the soft loans offered by partner banks: homeowners can only have one energy renovation the measure carried out (e.g. window replacement).</p>
Parma (IT)	<ul style="list-style-type: none"> ○ Single-family houses and apartments ○ The housing unit has to be the owner's main residence 	<ul style="list-style-type: none"> ○ Parma inhabitants ○ Homeowners ○ Have to pass the banks' creditworthiness check 	<ul style="list-style-type: none"> ○ Thermal insulation of roofs, walls, glass walls, doors and windows ○ Installation, regulation or replacement of heating systems connected or not to energy-efficient ventilation systems or hot water production ○ Installation of renewable energy sources. <p>All work must be performed by certified professionals able to deliver a declaration of conformity required by the law.</p> <p>Only measures going beyond the national energy efficiency standards are eligible.</p>

How to apply for soft loans?

According to Energy Cities (2017), the procedures for soft loans, in general, are as follows:

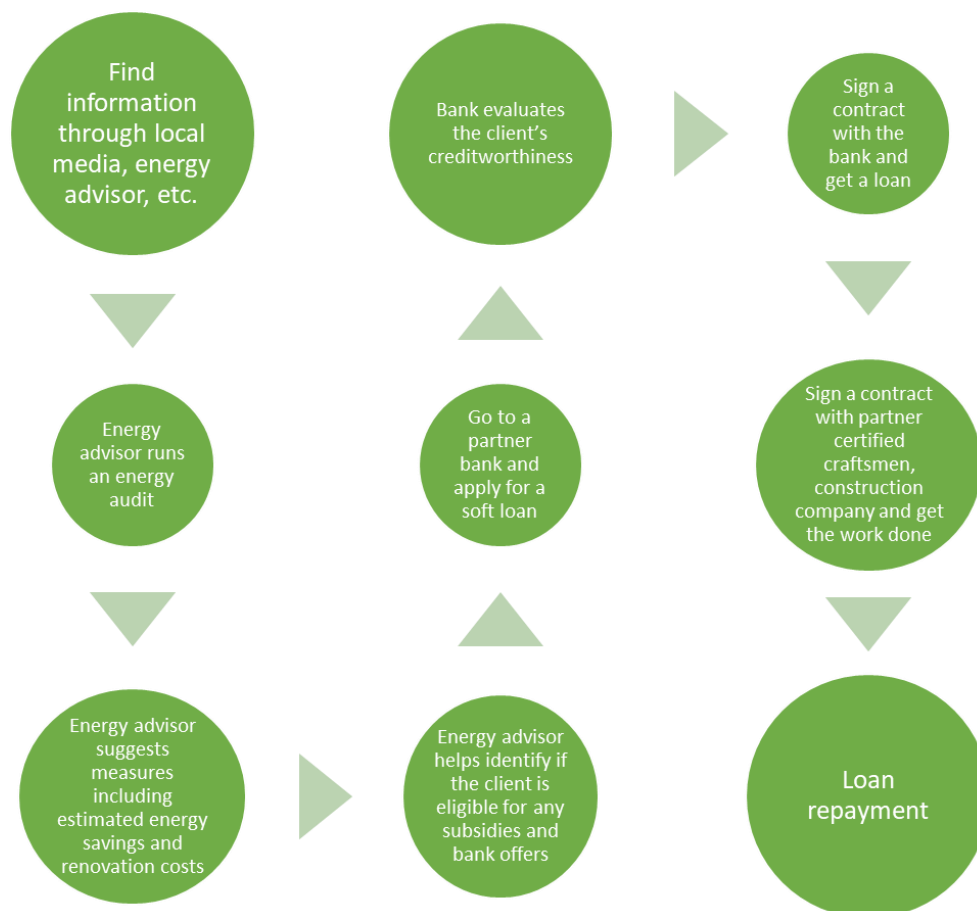


Figure 8: Step-by-step guide to a soft loan application process

Note: The procedures may vary in each city/region/country depending on the local initiative, policy, administrative culture, client's case, etc.

When can soft loans be used?

Just as guarantee funds, soft loans can be used only if the potential borrower has good borrowing capacity, collateral, and creditworthiness (ESMAP, 2014). When companies or private individuals decide to invest in energy renovation work but want to keep financial stability with adequate income streams, they tend to turn to debt financing provided by commercial banks. However, small-medium enterprises (SMEs) and private individuals (such as homeowners) with low to medium income are most likely unqualified to get a loan from commercial banks (Deelen & Molenaar, 2004). Soft loans can be the solution to trigger the energy efficiency market, so the high risk that commercial banks perceived is reduced due to the success rate of soft loans (Voïta et al., 2012).

What are other soft loans set up in Europe?

Soft loans alone are not sufficient for low to medium-income private individuals or companies to access in order to finance their energy efficiency investments that require high upfront costs. Therefore, soft loan initiatives are usually combined with other financing schemes, such as guarantee funds and revolving funds. **KredEx**, for example, provided not only loan guarantees but also revolving funds in the form of renovation soft loans. Supported by structural funds from the EU and extra credit lines from the Council of Europe Development Bank, KredEx offered soft loans at an average 4% fixed rate for 10 years to apartment communities. Other examples include **The Amsterdam Investment Fund** and **The Delft Energy Saving Fund** that combine revolving funds with soft loans. Through soft loans, The Amsterdam Investment Fund helped local enterprises, residents, housing associations, and community organisations in energy efficiency projects to reduce their carbon footprint and energy consumptions. The loan repayment is being revolved to invest in similar projects in the next 14 years. The Delft Energy Saving Fund has the same approach but focuses particularly on citizens and non-profit organisations. It offers preferential loans with an interest rate as low as 1.5% that is due in 10 years (FEDARENE, 2015).

Other soft loan mechanisms can also be combined with non-financial incentives such as technical support for the clients. This type of soft loan scheme is provided in several cities and regions in Europe including **Parma (Italy)**, **Riga (Latvia)**, **Frederikshavn (Denmark)**, **Bordeaux Metropole (France)**, and **Brussels Capital Region (Belgium)**. They collaborate with local banks and financing institutions to develop such soft loan schemes (Energy Cities, 2017a). [A guidebook to soft loans \(http://www.energy-cities.eu/IMG/pdf/guidebook_softloans_web.pdf\)](http://www.energy-cities.eu/IMG/pdf/guidebook_softloans_web.pdf) and [comparative analysis \(http://www.energy-cities.eu/IMG/pdf/infinite_solutions_comparative_analysis_web.pdf\)](http://www.energy-cities.eu/IMG/pdf/infinite_solutions_comparative_analysis_web.pdf) from Infinite Solutions provides further information related to those case studies.

Below are some initiatives that solely provide soft loans.

The Ecopack (Wallonia, Belgium)

A public interest body called SWCS (Société Wallonne du Crédit Socia) in Wallonia is in charge of this soft loan scheme. The loan is funded from a share capital with the regional government and the social housing association and also from the loan offered by CEB and commercial banks that are guaranteed by the regional government. Since May 2012, the Ecopack has provided loans with zero interest rates for home energy efficiency improvements. The amount of loan offered ranges from €2500 to €30000. As the energy renovation works are executed, the payments are made gradually and directly to the contractor or materials supplier. The clients then can pay back the loan for up to 12 years, depending on their total taxable income. Until 2015, over 8000 households were refurbished with the help of the Ecopack (FEDARENE, 2015).

Table 10: Requirements and main barriers of the Ecopack

Eligibility criteria of the beneficiary	Conditions for energy renovation works	Main barriers
<ul style="list-style-type: none"> ○ The loan's value must be set between €2 500 minimum and €30 000 maximum. ○ The building's initial construction permit must be dated before the 1st of December 1996. ○ The building must be sanitary. ○ The building must be on the territory of Wallonia. ○ The homeowner must not have their workplace in that building unless it is permitted by the SWCS. ○ The loan applicant must be either the occupying homeowner or the tenant. ○ The applicant must already occupy the place before submitting the loan request. ○ The applicant's total taxable income must be evaluated within the acceptable scope (€18.700 - €93.000). 	<ul style="list-style-type: none"> ○ The enhancements covered by the loan must be comprised of at least 2 types of works (which constitutes a package of works called "bouquet de travaux"), of which at least one must improve the energy performance of the building. Other small works can therefore be included (e.g. adding a thermostat) but also works that could be disconnected from the energy efficiency goals (replacement of the sewage system, replacement of the floors, lining of the chimney system, etc.). ○ Works must be carried out by contractors authorized by the SWCS. ○ Works have to wait for the SWCS' approval. ○ A preliminary study of the home must be carried out in case of insulation of the walls or floors unless an energy audit was already made. ○ For the applicants with a total taxable income of less than 18.700 € (cat. 1), thermal insulation of the roof is a package of works ("bouquet de travaux") by its own. ○ The addition of photovoltaic panels and micro-generation systems can be considered as part of the package of works, but benefits from a different financing instrument (certificates certificates, and therefore is not covered by the Ecopack. ○ The works must be carried out within a 2 year period. 	<ul style="list-style-type: none"> ○ The wide accessibility to this loan had created a windfall effect, overloading the SWCS' capacity for processing demands and lengthening the whole procedure. ○ An instrument limited to homeowners that are able to take on additional debt. ○ No wide-scale scheme has proven effective on a wide national scale. ○ It remains questionable to what extent demand does not remain artificial when it is only created by the publicly incentivized loan.

Source: FEDARENE, 2015

Table 11: An overview of the works covered by the Ecopack

Energy performance works	Other types of works
<ul style="list-style-type: none"> ○ Thermal insulation of roofs, walls, floors. ○ Replacing of window frames or of the glazing. ○ New ventilation systems. ○ Installation of natural gas condensing boilers. ○ Installation of heat pumps. ○ Installation of a biomass boiler. ○ Connection to a CHP network. ○ Carrying out energy audits 	<p>Associated works (« travaux induits »):</p> <ul style="list-style-type: none"> ○ Replacing, and repairing the roof. ○ Exterior walls skin. ○ Dress the interior walls. ○ Replacement of the sewage system. ○ Replacement of the floors. ○ The lining of the chimney system.
	<p>Small works contributing to energy savings:</p> <ul style="list-style-type: none"> ○ Adding a thermostat. ○ Isolation of heating pipes. ○ Thermographic audit.
	<p>Works targeting renewable energy generation</p> <ul style="list-style-type: none"> ○ <i>Covered by the Ecopack:</i> Solar thermal collectors for domestic hot water and/or heating. ○ <i>Not covered:</i> Photovoltaic panels and micro-generation systems.

Source: FEDARENE, 2015

More information can be found on: <https://swcs.be/>

Community Energy Loan Scheme in Kilkenny (Ireland)

This loan scheme is a product from St. Canice’s Kilkenny Credit Union in a partnership with the Sustainable Energy Authority of Ireland (SEAI) and Carlow Kilkenny Energy Agency (CKEA). The loans provided a lower interest rate of 6.4% than the market rate with an opportunity to obtain a rebate of up to 30% of the related costs. The loans specified several energy renovation measures that would be funded including the upgrade of heating systems, high-efficiency boilers or stoves, the installation of attic or wall insulation, the replacement of windows or external doors, and solar panel installation.

The very first procedure of getting the loan is to submit the application form and CKEA will conduct a home energy audit for €100. This fee can be returned if the applicant does not meet the eligibility criteria. Once considered eligible to be the loan beneficiary and the energy audit is finished, St. Canice’s Kilkenny Credit Union will contact the applicant to discuss it further (FEDARENE, 2015).

More information can be found on: <http://www.stcanicescu.ie/community-energy-loan/>

What is the summary of soft loans?

Soft loans are a financing scheme usually provided from public funding that reduces the interest rate below the market rate, so soft loans can be more accessible to those who wish to conduct energy efficiency buildings renovation, which usually require a high upfront investment. The following table presents an overview of soft loan financing schemes based on EEFIG (2014).

Table 12: Soft loans (Supply Driver)

Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+	+		+	++
Led by:	Public sector funding usually with private money levered and often deployed alongside a grant programme.				
Advantages	<ul style="list-style-type: none"> ○ Easy to roll out, however careful ex-ante analysis of supply and demand and legal/tax framework needed ○ Standardised supply offering at the same time flexibility according to individual preferences (repayment, interest rate fixation etc.) ○ The use of Cohesion funds for soft loans in housing is facilitated with the “renovation loan” (off-the-shelf instrument) ○ Allows 1:1 refinance to commercial banks (Basel III compliant) ○ Positive impact on public budgets due to leverage effects 				
Weaknesses	<ul style="list-style-type: none"> ○ Capacity/ willingness of owners to take more debt (i.e. very country dependent) ○ Risk aversion of banks (calling for guarantees from Governments) ○ The leverage effect of public funds is usually less than 10x and grants are often required alongside to improve energy efficiency ambition 				
Main obstacle/legal changes required	<ul style="list-style-type: none"> ○ Transaction costs to implement (technically) and manage long-term programmes within the financing institute ○ Increased focus on optimal rather than minimum energy efficiency standards 				
Best practice examples	KfW, NRW.BANK, Kredex, EBRD Sustainable Finance Facilities (SEFF), etc.				

What are the key lessons learnt from soft loans?

Similar to guarantee funds, soft loans on energy efficiency alone are not able to cover the whole investments. Taken from the Bordeaux Metropole case study, one financing scheme will not be suitable for all types of households or buildings. For very low-income households or corporates, a soft loan scheme should be combined with a subsidy, third party investment and/or guarantee fund, as the soft loan scheme typically aims for low to medium-income target groups.

When signing a contract, it is hard to specify a fixed interest rate that is in favour of both parties (the financing institution and the client). This is due to the nature of interest rate uncertainty that is growing most of the time. As a result, soft loans could be unappealing for some types of groups, especially those with higher incomes.

If one of the eligibility requirements for getting a soft loan is the energy savings achieved or energy efficiency measures implemented, the loan provider will need to assure that, especially when the loan comes from public funding. Such monitoring may result in more intricate procedures and increased costs for the institution and the partners. Consequently, it will discourage the potential clients to get the soft loans (Energy Cities, 2017a).

Revolving Funds

What you need to know about revolving funds



What are revolving funds?

A revolving fund is a pool of capital replenished by the cost-savings from energy efficiency and renewable energy projects or by the interest paid by the sustainability measures financed by the fund. These cost-savings or interest revenues continuously finance new investments in similar projects, resulting in a sustainable funding cycle. Revolving funds can be a potential solution to deal with the long payback time of the projects. It may be more effective in the long term if coupled with other financing schemes, mostly soft loans (BPIE, 2010). It may also be a good complementary to an ESCO (de T'Serclaes, 2007).

What are the types of revolving funds?

There are two types of revolving funds:

1. **External revolving fund:** it is often developed and managed by a selected fund manager (with its compensation tied to the fund's performance), or by a utility or specially created organisation. This type of revolving fund lends to multiple municipalities, which must repay the loan on an agreed date. It can form a partnership with service providers of energyefficiency or ESCOs to carry out the projects for the borrowers. It is very likely that the incentive payments should be made according to the energy savings achieved (ESMAP, 2014).

2. **Internal revolving fund:** it is a revolving fund developed by a single municipality of which the municipality funds the initial investment and may also take control (ESMAP, 2014). The structure of an internal revolving fund varies depending on the city's needs as well as local conditions. Other factors include “*mayoral powers, regulatory and legislative context, type and scale of infrastructure project, and the risk/reward profile of stakeholders*” (C40, 2016). The internal revolving funds need an initial capital contribution, which can come from the municipality's own budget, grants or loans from external sources and donors.

Why are revolving funds important?

Revolving loan funds commonly have certain targets and eligible types of groups determined, such as ESCOs or schools that wish to improve the energy efficiency of their building portfolio. Individual building owners mostly do not belong to the beneficiary group (National Renewable Energy Laboratory (NREL), 2011). Traditional investors are not used to energy efficiency projects and are unwilling to provide financing. Revolving loan funds help overcome this issue. For example, ESCOs cannot take on many big projects as they are short of necessary funding for upfront investment. Revolving loan funds can assist ESCOs in this regard by providing a more accessible pool of funds. This also applies to other segments of the building market, such as fairly large institutions and corporates (Becqué et al., 2016).

Revolving funds can also help prove that energy efficiency projects can be commercially feasible in the long run. This financing scheme helps the capacity development of service providers, such as energy auditors, craftsmen, construction companies, and ESCOs. Therefore, revolving funds can help encourage more commercial financing in the energy efficiency market (Limaye et al., 2014).

How do revolving funds work exactly?

Most revolving fund programmes offer loans with a specific maturity and determine what types of projects can be funded (NREL, 2011). The funding sources of a revolving loan fund usually come from the government, which may be in the form of dedicated taxes on energy sources. The execution may be handled by partner banks, including the evaluation of loan applications, monitoring of loans and collection of loan repayments (Voïta et al., 2012). The money from loan repayment goes back to the revolving fund to make new loans for similar projects. The additional fees like the interest rates paid by the borrowers are mostly to cover programme administration costs, so the initial capital of the fund is not disturbed. Revolving funds are usually managed by government bodies or non-profit organisations with the aim of making positive changes within target beneficiaries (NREL, 2011). The following figure shows the cash flow in a revolving loan fund for energy efficiency (EE) or renewable energy (RE) projects.

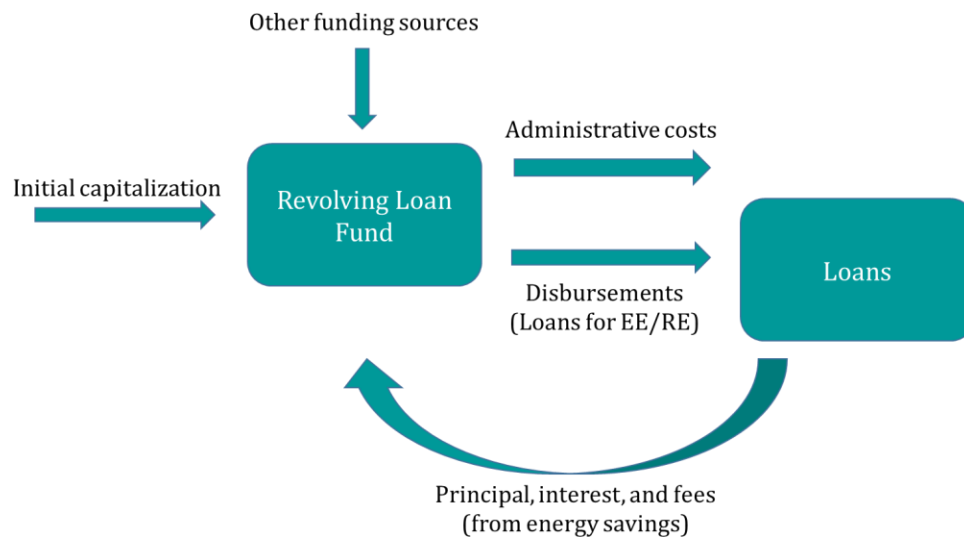


Figure 9: Cash flow of revolving loan fund. Source: NREL, 2011.

What are the advantages of revolving funds?

According to BPIE (2010), FEDARENE (2015), and de T'Serclaes (2007), the advantages of a revolving fund scheme are as follows:

- Enables recycling capital for future use
- More efficient allocation of public funds
- Allows long-term sustainability of public investment
- A direct and clear impact on the financial barrier issue, which is lack of liquidity
- Can help demonstrate the commercial viability of EE investments and provide credit histories, paving the way for future commercial financing.

What are the weaknesses of revolving funds?

According to BPIE (2010) and de T'Serclaes (2007), the weaknesses of a revolving fund scheme are as follow:

- Temporary impact on the financial barrier issue
- Does not contribute to long-term market transformation, unless it lasts for so long that sustained stable demand will have been created
- Does not call for any particular innovation from the market
- Limited budget to finance the measures
- The payback period limited to 15 years
- The setup and operation of a revolving fund can be administratively difficult, for example, it may be needed to apply significant effort in educating financial administrators on how to recognise savings

What are the main barriers to revolving funds?

According to FEDARENE (2015), the main barriers to a revolving fund scheme are as follow:

- Parallel negotiations with many different partners
- The economic situation in the country may change dramatically and therefore change the behaviour of final beneficiaries
- The complex architecture of the fund: the preparation takes a very long time (and incurs considerable costs)
- Final beneficiaries, even with active awareness-raising measures, remain reluctant

How to identify appropriate measures to be financed through revolving funds?

The following steps can be undertaken to check whether a measure is appropriate to be financed through the revolving fund (Energy Cities, 2017b):

1. **Consult potential customers in charge of planning new construction, renovation, retrofits or maintenance about your scheme.** Ask about what is on their schedule. Try to steer their investment decisions towards energy efficiency beyond the current standard by offering additional Internal Contracting funding.
2. **Check whether the energy-saving measure will not be the subject of, or affected by, a more significant retrofit or new construction,** which could replace the whole installation before the investment of the measure is paid back.
3. **Examine the profitability of a project,** by determining:
 - a. The economic parameters: the investment cost and the resulting expected financial savings calculated by multiplying the energy savings and the cost per energy unit.
 - b. The payback time: the investment divided by the annual energy cost savings.
 - c. The operational lifetime of a measure: which depends on the durability of its technical parts.

Only projects with feasible investment costs and payback times are suitable for funding via Internal Contracting. Therefore, consider the following:

Payback time < operational life of the measure = economically viable

Payback time > operational life of the measure = not viable

How to manage the investments of the revolving fund?

The initial monetary value of the fund is set up at the start of the scheme. New investments are financed by energy cost savings gained and paid back by the implemented measures previously invested by the fund.

In order to be able to finance several energy-saving measures throughout the years using the initial monetary value of the revolving fund, a few aspects need to be considered:

1. **The fund cannot cope with investments of any size.** The cost of a single investment has to be lower than the fund's value.
2. **The total annual investment should be limited to only a share of the fund's value** since the fund is intended to pay for investments made in different years with paybacks also extending over several years.

The investment cost and payback period must be suited to the revolving loan fund in order to sustain the implementation. The longer the payback period, the lower the investment that can be funded annually, as it takes a longer time to replenish the fund. *"Increased investment costs can completely halt this business model"* (Energy Cities, 2017b).

Who can lead and provide revolving funds?

Public entities usually contribute to revolving funds by subsidizing interest rates or financing the main investment partially or fully (Voïta et al., 2012). Government can set up a revolving fund when the funds and expertise are sufficient. In some cases like Riga (Latvia), an energy agency can also establish this business model and coordinate all stakeholders on behalf of the city. Energy audits and energy retrofit works can be conducted by the energy agency within the framework of the energy refurbishment projects that is eligible for the revolving fund (Energy Cities, 2017a).

The primary issue in creating revolving funds is seeking the initial capital of the fund. The initial capital can be obtained from the government's own funds and budget, grants/loans from donors or other external funding sources. Revolving funds may be developed and administered by local, regional or even national governments. *"In such cases, the funds are often managed by a competitively selected fund manager with its compensation tied to the fund's performance."* When revolving funds are established at a local level, they can encourage to recognise total costs and benefits of projects in the long run (Interreg, n.d.).

Who can apply for revolving funds?

According to Limaye et al. (2014), the eligibility requirements used to evaluate potential beneficiaries of revolving funds may include the following:

- A. For debt financing:
 - The creditworthiness of the potential beneficiary
 - Existence of consumption-based payments for heating
 - Good energy bill payment discipline
 - The existing comfort level of at least 50 percent³
 - Building in reasonably sound structural shape

- No current or imminent plans for closure/privatization
 - Ability to retain cost savings to allow loan repayments⁴
 - Potential use of commercially available technologies
 - Minimum and maximum loan amounts
 - Proper project preparation and documentation
- B. For energy service agreements:
- Availability of historical energy bill data
 - Consumption-based billing and good energy-bill payment discipline
 - Building in reasonably sound structural shape
 - No plans for closure or for major changes planned in building operations
 - Willingness and ability to sign energy service agreements spanning multiple years
 - Willingness to work with the fund's payment security mechanism

The Bulgarian Energy Efficiency Fund (BEEF) is an example of a revolving fund initiative that is intended for energy efficiency investments. The beneficiary groups include industrial, commercial, and residential buildings. Below are the main eligibility criteria for getting the fund:

- The project should involve the application of well-proven technology
- The project cost should range between €15,000 and €1,500,000
- Minimum equity of 10% under co-financing and 25% for stand-alone financing
- The payback time of up to five years
- Required collateral: mortgage, pledges under Special Pledges Act, claims on accounts and commercial contracts, financial risk insurance, bank guarantees, etc.

³ The "comfort level" in a building is defined as the ratio of the actual energy consumed for providing heating comfort to the amount of energy that would be needed to provide the desired or standard comfort level. If this ratio is small, it is unlikely that the EE project that will be designed to provide the desired comfort level can provide cost savings.

⁴ Alternatively, the existence of a payment security mechanism that will assure loan repayment.

How to apply for revolving funds?

According to Energy Cities (2017), the procedures for revolving funds in the case of Riga (Latvia) are as follows:

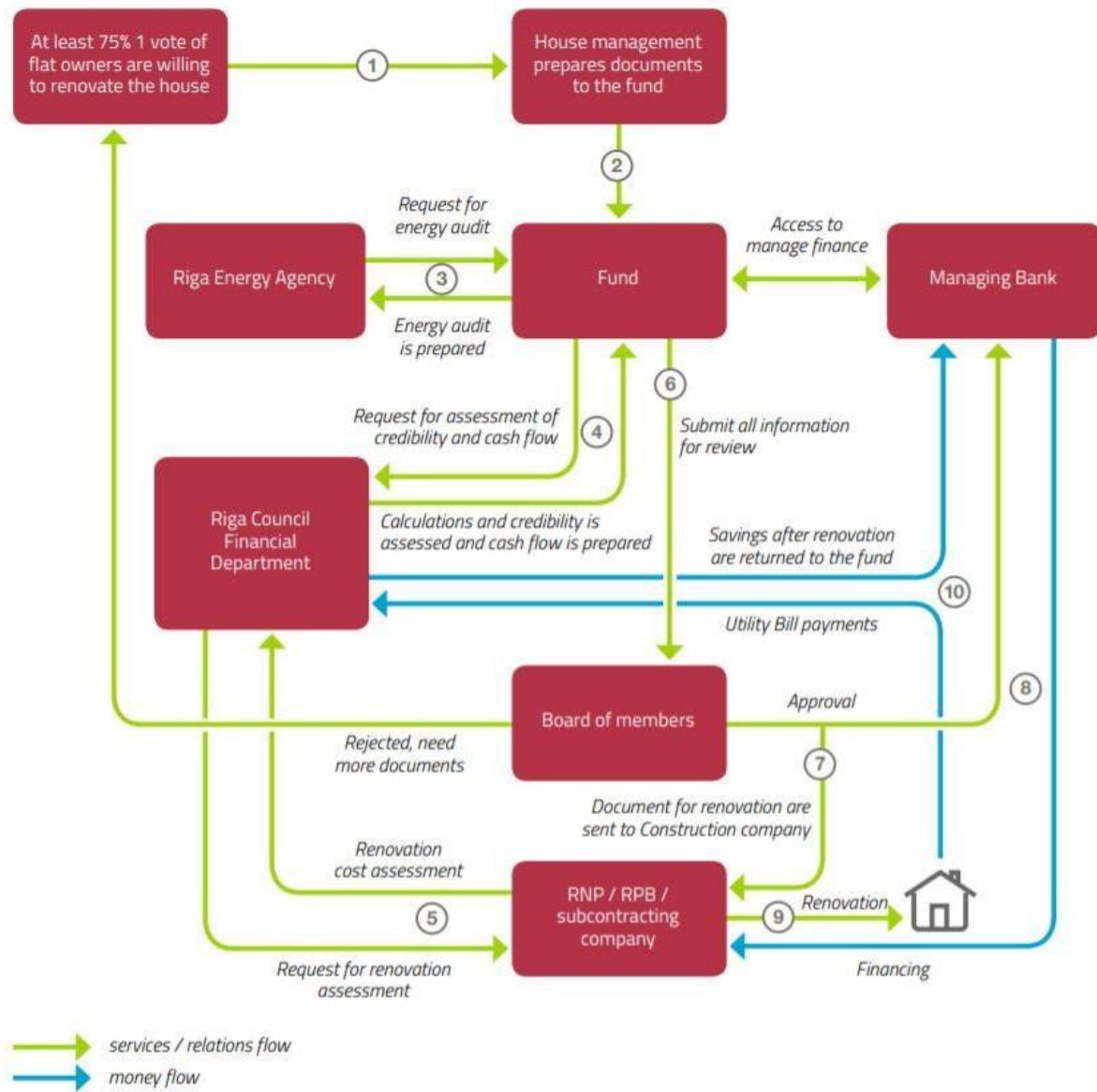


Figure 10: Business model of Riga Energy Agency's revolving fund

Table 13: Step-by-step guide to applying for revolving fund of Riga Energy Agency

Application	<ol style="list-style-type: none"> 1. At least 75% + 1 vote (or 2/3) of flat owners are willing to renovate. 2. The House manager prepares the documents and applications that are submitted to the fund
Review process	<ol style="list-style-type: none"> 3. Riga Energy Agency (REA) <ol style="list-style-type: none"> 3.1. The energy audit request is submitted 3.2. The energy audit is prepared and returned to the Fund 4. Riga Council/Financial Department <ol style="list-style-type: none"> 4.1. Request for assessment of creditworthiness and future cash flow 4.2. Calculations and creditworthiness are assessed and cash flow is prepared 5. Riga House Managers (RNP)/ Riga City Builder (RPB) <ol style="list-style-type: none"> 5.1. Request for renovation assessments 5.2. Renovation cost assessment provided
Process of approval	<ol style="list-style-type: none"> 6. The fund gathers all information about the building and submits it to the Board of Members. 7. If the Board of Members approves the application, the documents approving the renovation are sent to a Construction company. 8. Managing Bank <ol style="list-style-type: none"> 8.1. Immediately after the application for renovation is approved, the request to provide financing is sent to a Managing Bank. 8.2. Financing is provided to a construction company.
Renovation and post-renovation	<ol style="list-style-type: none"> 9. At this stage, a construction company is able to start the renovation. 10. Repayments <ol style="list-style-type: none"> 10.1. Once the renovation is completed, the building's energy consumption is reduced. Homeowners pay back the loan through the utility bills to the Riga Financial Department. 10.2. Savings after the renovation are then calculated and sent from the Financial Department to the Managing Bank.

What are other revolving funds set up in Europe?

Lithuanian Energy Efficiency Housing Pilot Project (EEHPP)

The EEHPP implemented a revolving fund scheme in 2001. One of the goals is to support energy efficiency projects in the residential sector. The scheme aims to encourage private initiatives to improve energy efficiency. It was financially supported by the Lithuanian government, the World Bank, the Danish Ministry of Housing and Urban Affairs and the Dutch Ministry of Economics. Within four months, over 200 households carried out energy efficiency works with the help of the EEHPP. The measures include new heat substations, window replacement, as well as roof and wall insulation (de T'Serclaes, 2007).

The European Dexia-Fondelec Energy Efficiency and Emissions Reduction Fund

This initiative ran from 2000 to 2010. The aim was to support companies and projects in energy efficiency investments, mainly in Central and Eastern Europe. The initiative acted as a trigger for energy refurbishment in the private sector. The funding sources come from Dexia-Public Finance International Bank, FondElec Group, and EBRD. The initiative became the first commercial investment vehicle that supports the carbon credits distribution to shareholders by investing in energy-saving projects (de T'Serclaes, 2007).

Energy Fund Den Haag (ED)

This fund was established by the Municipality of The Hague in 2013. The funding sources came from the municipality's own fund, EFRD and Programme Authority "Opportunities for West". This fund focuses more on renewable energy and energy efficiency projects in the territory of The Hague. Through the fund, the municipality intends to attract more private funding to support both the funds and the projects. This fund also incorporates other schemes, such as soft loans and guarantee funds, as guarantee funds serve best with complementary financial instruments. The beneficiaries of this fund come from public and private sectors, including project developers, housing corporations, businesses, foundations and NGO's and public entities e.g. municipalities, local authorities. As of December 2014, the fund supported almost € 4 million for five projects, one of which was the installation of solar panels for a football club house (CITYinvest, 2015).

Bulgarian Energy Efficiency and Renewable Sources Fund (EERSF)

The fund was set up in 2005 under a form of a public-private partnership. The initial capital was obtained from the Bulgarian and Austrian Governments, the Global Environment Fund (GEF) through the World Bank's International Bank of Reconstruction and Development (IBRD), and the private sector in Bulgaria. The fund does not only target the public sector, but also the private sector including Project developers, ESCOs, Project contractors, housing corporations and businesses. The aim is to create a sustainable market-based capacity for developing and financing commercial energy efficiency projects in Bulgaria. The fund also helps prove that energy efficiency investments are profitable so the market in this sector can be more developed. The EERSF also provides technical support free of charge. Like most of guarantee fund initiatives, the EERSF includes other financial instruments, such as soft loans and guarantee funds. As of December 2014, the EERSF has funded 53 projects in the private sector for a total amount of 13.1 million BGN with a total project investment value of 18.6 million BGN (CITYinvest, 2015).

Romanian Energy Efficiency Fund

This fund, also called FREE (Fondul Român Pentru Eficiența Energiei), began to operate in June 2003 with an initial fund of US\$10 million from GEF. The FREE allows corporates in the industrial sector and other energy consumers to carry out energy-efficient projects under commercial conditions. Within 5 years, 12 projects in the private sector have been accomplished. The projects included changing old energy generation equipment to a more energy-efficient one. Each project must profit at least 50% from energy savings to be eligible for the fund (Limaye et al., 2014).

Salix Finance Ltd, United Kingdom

Salix Finance is an independent, not-for-profit company funded by the Department for Energy and Climate Change, the Welsh Assembly Government and the Scottish Government via the Carbon Trust. This entity enables public sector organisations to increase their energy efficiency through zero interest loans aimed at financing investments in a variety of energy efficiency projects. One of the compliance criteria is that the total payback must be achieved within five years, thus significantly limiting the fund's action scope. Salix projects have on average a lifetime of 13.5 years and have reached returns on investment in 3.5 years. Once the loan is repaid, the organisation continues to benefit from the energy savings for another 10 years. By June 2013, Salix Finance had funded over 9 000 projects, with 661 public sector bodies, valued at £ 194 M (€ 220 M), saving the public sector £ 56 M (€ 65 M) annually, and £ 750 M (€ 881 M) over project lifetimes as well as delivering CO2 emission savings of 340 000 tonnes per annum and 4 5 M tonnes over the lifetime of the projects.

Salix Finance works in partnership with 146 public sector organisations, providing "revolving funds" valued at £ 40 M (€ 47 M). These funds are available to local authorities and universities to finance

ring-fenced projects, with paybacks of less than 5 years on average. The financial savings are used to repay the investment capital. (<https://www.salixfinance.co.uk/>)

What are the key lessons learnt from revolving funds?

As the loan payback time can take years, the fund will take a long time to replenish its capital. Therefore, a revolving fund needs one or more dependable funding sources to continue financing other projects (Limaye et al., 2014). Take an example from the Bulgarian revolving fund, BEEF. The government's support decreased gradually making the BEEF lacked ownership at the end of the project. The government did not seek more funding sources for the BEEF to grow its initial capital (World Bank, 2010), making the BEEF unable to sustain itself longer.

Overall, to be more sustainable, revolving funds should be combined with other financial instruments. Various public financial incentives, such as tax credits, tariffs, depreciation, and mandated audits, can increase the funds and develop the market. The funds should be able to offer interest rates below the market rate, like soft loans, and/or other incentives, like technical assistance, to appeal to potential clients (de T'Serclaes, 2007).

Toolbox and Materials

- [Tools for choosing guarantee fund structures](#)
- [Materials on Energy Efficiency in Buildings](#)
- [Building \(Energy Efficiency\) Upgrade Value Calculator for Commercial Properties](#)
- [Comparative Study on Financing Schemes Used for Energy Efficiency in Buildings](#)
- [Guide to Financing the Energy Renovation of Residential Buildings through Soft Loans](#)
- [BPIE: Financing Energy Efficiency in Buildings](#)

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