



Increasing capacities in Cities for innovating financing in energy efficiency

A review of local authority innovative large scale retrofit financing and operational models

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Introduction

The current economic situation in Europe creates concerns for and barriers to the deployment of local sustainable energy services. Therefore, much attention needs to be placed on developing and introducing innovative financing models, as well as redefining and improving existing financing schemes. More incentives are needed to stimulate private investments and realize a wider implementation of the successful solutions for financing energy efficiency renovation in buildings. Currently investors act on energy efficiency measures in buildings with short or medium pay back periods of less than 10 years, leading to energy efficiency of less than 30% savings. However, European targets for 2050 require energy savings of up to 80% in buildings, requiring investments with a much longer payback period, ranging from 20 to 40 years.

The innovative financing schemes that are mentioned in the framework of CITYinvest are mechanisms/instruments developed across the European Union to provide adequate financing solutions to address large scale and deep energy efficiency renovations in buildings. Although these schemes have been proven successful in specific places, they have not yet been widely used across Europe. Barriers hinder the replication of the experience and the realization of a wider deployment in Europe. The schemes are Energy Performance Contracting (EPC), Third Party Financing (TPF), revolving funds and cooperative models.

Financing or business models are the specific organizations, structures or dedicated teams on a local, regional or national basis to support energy efficiency investments in the territory by using innovative financing schemes (as described above). The models can make use of one financing scheme or a combination of different ones according to what best fits the context.

The public sector has an important role to play: with adequate support they can initiate and facilitate a movement bringing together different stakeholders (private and public) needed to enable energy efficiency investments in private and public buildings, understand what is being done across Europe and replicate the suitable business models in their territory. CITYinvest's main objective is the promotion and replication of innovative financing schemes for energy efficiency in buildings through renovation. To ensure this, we have gathered and benchmarked existing models and produced an assortment of guidance materials to support local authorities in identifying which approaches to financing energy efficiency and renewable energy might be most appropriate in the light of their local circumstances.

The present report is the first guidance material produced within the CITYinvest project. It gives to the reader a high level review of models that have been implemented so far to facilitate large scale retrofit projects involving local authorities in Europe. The aim of this report is to review the characteristics of the most effective initiatives that are currently being developed and deployed, and to draw up a features and benefits matrix as well as risks and issues arising analysis, such that any local authority can appreciate which model may be most appropriate to their own circumstances and what are the steps to be considered to develop their own model.

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Scope of the study

We have considered twenty-four models in this report reflecting the most advanced initiatives that are currently being developed and deployed in financing large scale financing retrofit programs in eleven European countries (see figure 2). All of the models involve public authorities working closely with the private sector and/or the citizens but the nature and depth of the relationship between the parties varies significantly as do the sources of finance and the level of risk taken by the respective partners. The selection of models also covers the full range of public authorities, ranging from small municipalities to national governments, through the regions, provinces, large cities and county councils.

To properly understand the specific features of each model, the analysis has attempted to dissociate models into two components:

- The operational scheme which it refers to, as well as the project implementation mode (operational framework)
- The financial scheme which it refers to in order to finance the projects (financing framework)

This analysis allowed identifying elements common to the different models or parts of them and that served as key to the structuring and classification of the models into sub-models. The study has identified three operational schemes (facilitation, integration, aggregation) and four financial schemes (Financial Institutions financing, ESCO financing, Program Delivery Unit financing, Investment fund) used to compare models with each other and understand their implications: contractual, operational and financial. The result of this classification is provided in the table below (see fig 1).

It goes without saying that this classification is already showing great guidance on the type of possible model available to the public authority that wants to develop a large scale financing retrofit program taking into account its own situation. This classification refers in fact to common levels of ambition, impact considerations on the public debt, the requirements in terms of human and financial resources, as well as information on the addressable size of the program.

Guidance to this classification is provided in section one of this report, which focuses its attention on a detailed explanation of each sub-model to fully understand its implications, requirements, advantages and disadvantages. Section three provides a detailed analysis of the models individually. This analysis deepens the description of operational and financial schemes of each model, identifies the operational, contractual and financial relationships between the parties in order to give a comprehensive view of their modus operandi. It also gives information on the results achieved to date by these models and criteria to be considered with a view to replicate or be inspired by them. Thus, we invite the reader to have a double reading, both the key elements common to models and the more detailed description of the models that best meet the specific situation of the reader.

In order to assist local authorities in determining which of the models might best suit their specific situation and the level of ambition, we have developed a Recommendations and Decision Matrix tool shown in section 4 of the report and a Strategic Planning and Action plan template shown in section 3 of the report. The tools give a set of key questions to address while using the deliverables of the study.

Fig. 1. Model positioning synthesis

Model positioning synthesis					
	Facilitation model		Integration model		Financing only model
	Without aggregation	With aggregation	Without aggregation	With aggregation	
FI financing (*)	REDIBA Eco'Energies EERFS	Berlin ESP RE:FIT Vlaams energiebedrijf ENSAMB Energie POSIT'IF	Warm Up North	-	N/A
ESCO financing	REDIBA Eco'Energies EERFS	Berlin ESP RE:FIT Vlaams energiebedrijf Rotterdam GB EE Milan PadovaFIT!	-	-	N/A
PDU financing (**)	OSER	Fedesco Ox Futures	OSER	Fedesco Energie POSIT'IF Eandis EDLB EscoLimburg 2020 SPEE Picardie	N/A
Investment fund	EERFS SUNSHINE	-	-	EscoLimburg 2020 Cambridgeshire MLEI	Energy Fund Den Haag KredEx
Citizens financing	-	OxFutures Brixton Energy Co-op	-	-	Saerbeck

(*) FI financing = Financial Institutions financing

(**) PDU financing = Program Delivery Unit (PDU) financing

These tools are currently used in the development of three pilot projects within the CITYinvest project that aim to replicate the most appropriate model to implement a large scale financing retrofit program at a local level. These pilot projects are carried out with the support of CITYinvest by the regional agency Info Murcia in Spain throughout the Region of Murcia, by the 'Groupement Economique pour le Redéploiement de Liège' (GRE Liège) in Belgium at the level of the province of Liège and the Association of municipalities of the Rhodope Region in Bulgaria at the level of municipalities in that southern area of the country. These three pilot projects cover a broad spectrum of local authorities levels ranging from a region to a group of municipalities through a province. We invite the reader that is interested to develop its own large scale financing retrofit program to learn about the development of these pilot projects and their future results, as sharing experiences and feedback is an essential key to success.

Finally, in order to facilitate the reading of this report we advise the reader to first have a look at the glossary available in section 5 of the report. The analysis of the models uses a number of terms and definitions that structure the understanding of models.

Fig. 2. List of models

#	Name	Country	Ownership	Program Authority	Program Delivery Unit	Beneficiaries
1	Renewables and Energy Efficiency Diputación de Barcelona – REDIBA	Spain	Public	Barcelona Provincial Council	REDIBA TA (REDIBA Technical Assistance Unit)	Municipalities and provincial authorities
2	Berlin Energy Saving Partnerships	Germany	Public/Private	Federal state of Berlin	Berlin Energy Agency (BEA)	Local authorities (95%), Health Care Sector (5%)
3	London's Building Retrofit Programme - RE:FIT	United Kingdom	Public	Greater London Authority	RE:FIT Programme Delivery Unit (PDU)	London based public organisations
4	Regional Energy Services Company Vlaams Energiebedrijf - VEB	Belgium	Public	Flemish Region	Vlaams Energiebedrijf NV	Public organisations in Flanders
5	Regional Energy Services Operator - OSER	France	Public	Region of Rhône-Alpes	SPL OSER (Public Regional Energy Services Operator)	Regional Public authorities
6	Fedesco	Belgium	Public	Belgian Federal State	Fedesco	Federal administrations, regional, provincial and local authorities
7	Eandis EDLB	Belgium	Public	Eandis	Eandis EDLB	Cities, municipalities, Provinces
8	ESCOLIMBURG2020	Belgium	Public	Province of Limburg/ Infrac	Infrac ESCO	Cities, municipalities, Provinces
9	Eco'Energies (CCI Nice Côte d'Azur)	France	Public	CCI Nice Côte d'Azur	CCI Nice Côte d'Azur	SMEs
10	Energy Fund Den Haag	Netherlands	Public	Municipality of The Hague	Energiefonds Den Haag (ED) C.V.	Project developers, housing corporations, businesses, foundations, NGO's and public entities
11	Energies POSIT'IF	France	Public	Region of Île-de-France	SEM Energies POSIT'IF	Residential multifamily apartment buildings
12	Community based Renewables - Climate Community Saerbeck	Germany	Public	Municipality of Saerbeck	Energiemanagement Saerbeck	Citizens, associations, local authorities, businesses, farmers, regional authorities
13	Cambridgeshire MLEI	United Kingdom	Public	Cambridgeshire County Council	Cambridgeshire Low Carbon Delivery Unit	Public sector, schools, commercial buildings, community
14	OxFutures	United Kingdom	Public	Oxford City Council, Oxfordshire County Council	Low Carbon Hub	Public sector, schools, commercial buildings, community
15	Rotterdam Green Buildings	Netherlands	Public	Municipality of Rotterdam	Project Management Bureau	Municipality of Rotterdam's owned public buildings
16	Energy Efficiency Milan Covenant of Mayors	Italy	Public	Province of Milano	Dedicated Project Implementation Unit	Municipalities in the province of Milan
17	ENSAMB	Norway	Public	Regional Council of Sør Østerdal	ENSAMB	Municipalities
18	Brixton Energy Co-op	United Kingdom	Private	Lambeth Council	Repowering London	Citizens
19	Bulgarian Energy Efficiency and Renewable Sources Fund - EERSF	Bulgaria	Public	Government of Bulgaria	EEE Consortium "Econoler-EnEffect-Elana"	Project developers, ESCOs, Project contractors, housing corporations, businesses, public entities
20	SUNSHINE	Latvia	Private	N/A	LABEEF	Residential Multifamily Buildings (MFB)
21	Warm Up North	United Kingdom	Public/Private	North East England Councils	British Gas	Residential buildings and non-domestic public buildings
22	SPEE Picardie	France	Public/Private	Regional Council of Picardie	SPEE Picardie	Residential buildings
23	KredEx Revolving Fund for energy efficiency in apartment buildings	Estonia	Public	Government of Estonia	Kredex Foundation	Housing associations and public social housing
24	Padova's apartment building retrofit programme PadovaFit!	Italy	Public	Municipality of Padova	PadovaFIT! Consortium	Residential apartment buildings and public housing and service facility buildings

Section 1 – Comparison of the models



1. Comparison of the models

1.1. Level of ambition and beneficiaries

The beneficiary profile, the type of projects and certainly the level of ambition of the Program will have a significant impact on the model to apply.

The level of ambition

The figure 3 details the impact of the level of ambition on two criteria:

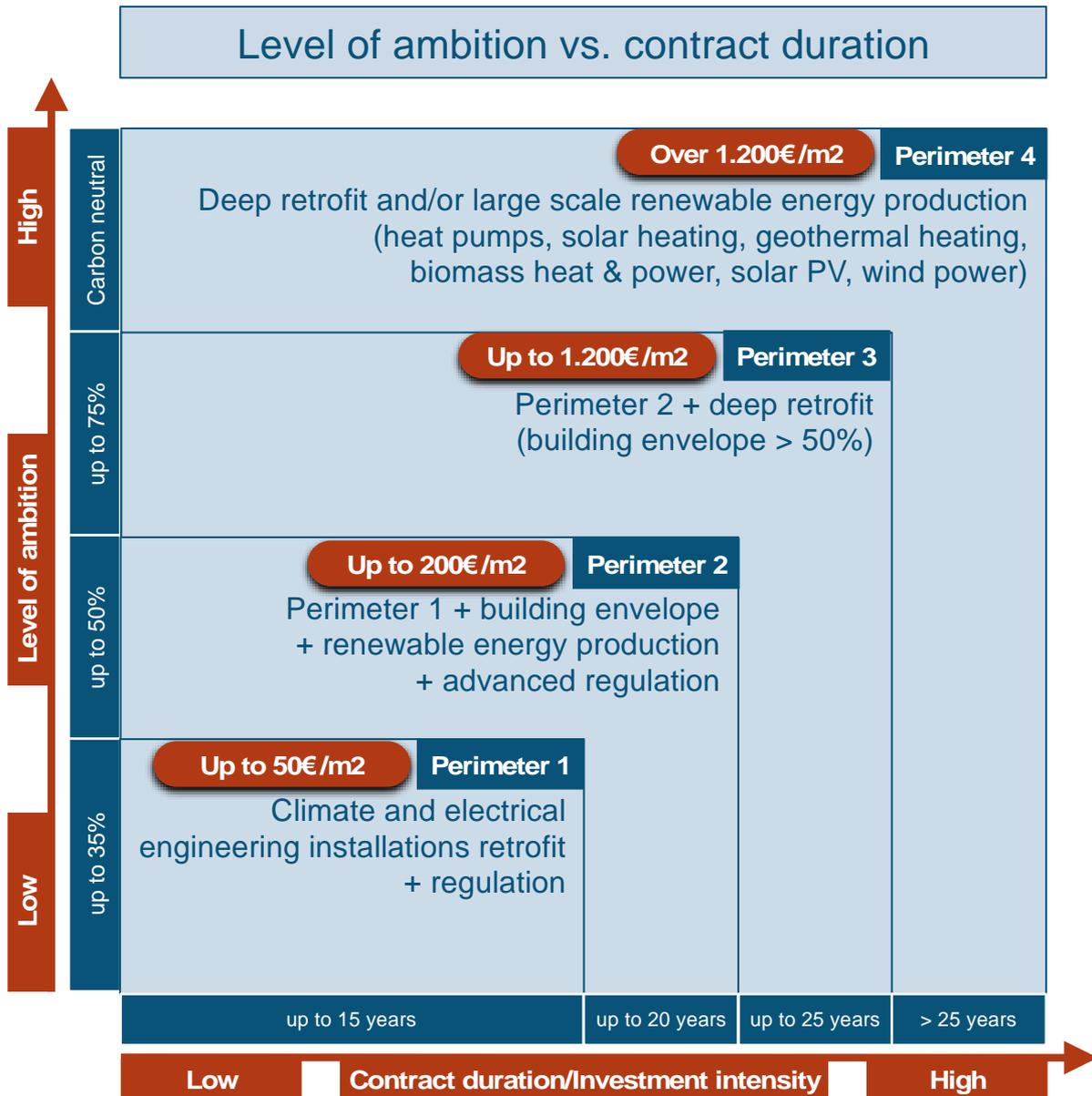
- the contract duration;
- the investment intensity.

The data is based on a study conducted by Energinvest for the French financial institution Caisse des Dépôts as part of the implementation of the Grenelle law adopted by the French Government in 2009. This data was updated based on the feedback from various projects lead by Energinvest in Belgium and abroad.

The level of ambition can be classified as follows:

- Up to 35% reduction of energy consumption and/or GHG emissions: this level of ambition could be reached with short and middle term contract durations (average 10 years) based on technical installation (HVAC, lighting, electrical...) retrofits and managed energy services. As basic indicator of investment intensity, the price per square meter in case of a building retrofit could be less than 50€. Typically the ESCO (Energy Services Company) private market-based offer targets this level of ambition and there is at date a large number of EPC/ESC projects implemented in Europe. The private market is also able to offer ESCO and/or Third Party Financing (TPF) options for this level of ambition.
- Up to 50% reduction of energy consumption and/or GHG emissions: this level of ambition could be reached with middle and long term contract durations (between 15 and 25 years) based on technical installations (HVAC, lighting, electrical...) retrofits, envelope retrofits (insulation), renewable energy equipment and managed energy services. As basic indicator of investment intensity, the price per square meter in case of a building retrofit could be less than 200 €. There are various examples in Europe of EPC/ESC models that have addressed such a level of ambition. ESCO financing and/or TPF financing will be more challenging for this level of ambition.
- Up to 75% reduction of energy consumption and/or GHG emissions: this level of ambition can only be reached with long or very long term contract durations (min. 25 years) based on deep retrofits. In most cases, investments can only be partially financed through the energy savings. In such projects the main driver is often not even the energy savings objective, but a thorough functional renovation. As basic indicator of the investment intensity, the price per square meter in case of a building retrofit could reach 1,200 € or more. There are a few examples in Europe of EPC/ESC model that have addressed such a level of ambition. This level of ambition requires a mix of financing solutions (own funds, conventional financing, ESCO financing, PDU financing, Investment fund).
- Carbon neutral: this level of ambition can only be reached with combined deep retrofit and large scale renewable energy generation projects. Also here, the driver will be essentially functional and not only energetic. Substantial amounts of own funding is most often required. There are very few examples in Europe of projects or models that have addressed carbon neutrality. This level of ambition will require a broader mix of financing solutions (own funds, conventional financing, ESCO financing, PDU financing, Investment fund).

Fig. 3. Level of ambition vs contract duration/investment intensity

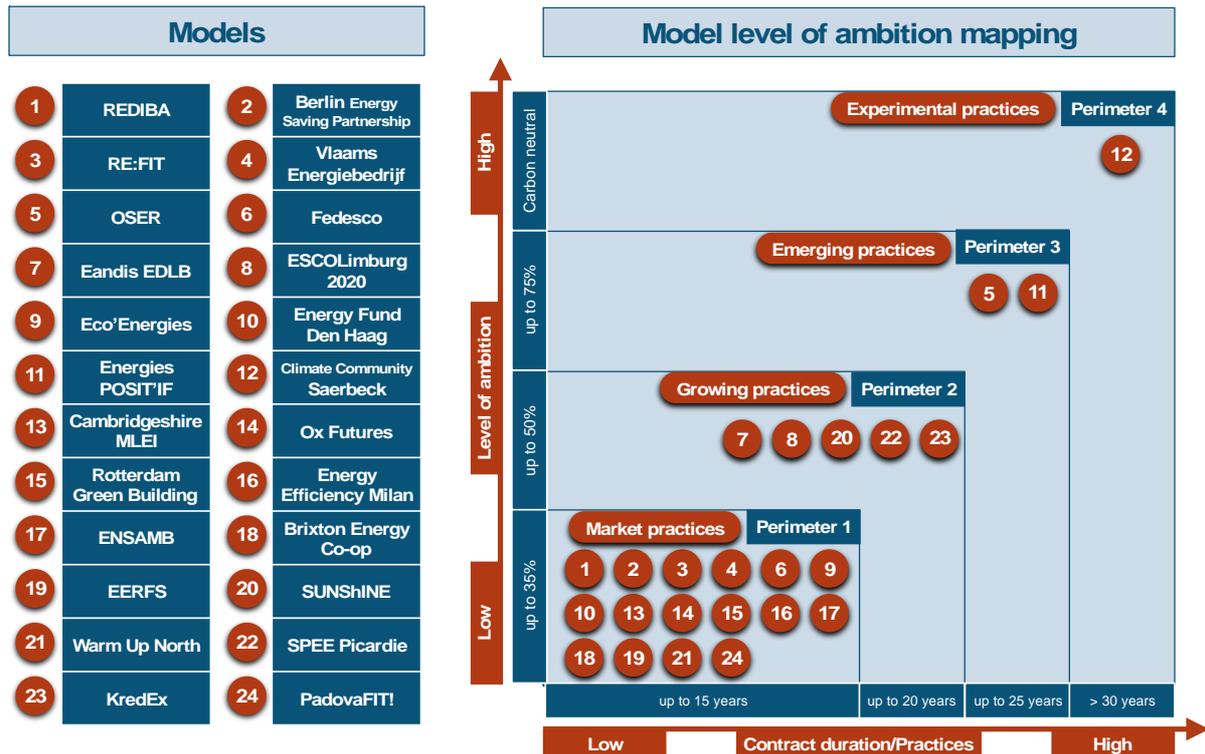


What are the levels of ambition targeted by the models?

Figure 4 details the level of ambition that the analysed models target.

A great majority of the models target the first perimeter, as shown in the figure. This level of ambition could be qualified as the "standard market practice" that relies mainly on the facilitation operational model, the EPC/ESC implementation methodology (see below) and a conventional or Third Party Financing. However, we see that the factor 2 (50% savings) and factor 4 (75% savings) levels gain in attention, as 7 models are targeting those levels of ambition. These models could be qualified as growing and emerging practices. They rely mainly on the Integration operational model and the Separate Contractor Based (SCB) implementation methodology. Furthermore, a majority of these models integrate the financing either through the Program Delivery Unit (PDU) or a dedicated investment fund. Carbon Neutrality is aimed at by one model only (Saerbeck), which is really apart from the other ones as it combines all the approaches used in the studied models to achieve its objectives. The study has not identified another European initiative having a proven record in this field, meaning that this level of ambition remains the exception and could be qualified as experimental practice.

Fig. 4. Model level of ambition mapping



Who are the beneficiaries addressed by the models?

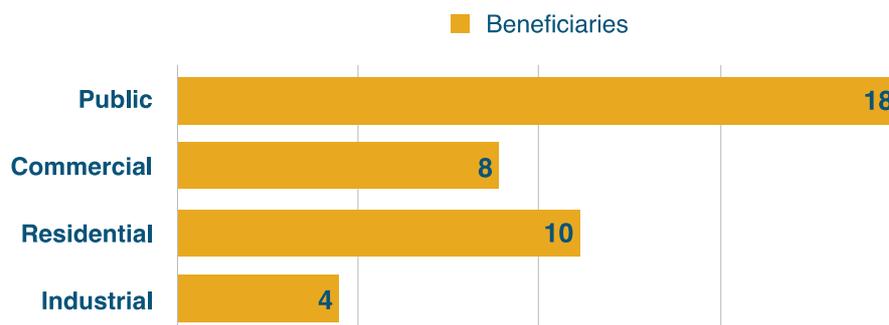
Figure 5 and 6 detail the beneficiaries that the analysed models target.

Beneficiaries come from the public, commercial sector, residential and/or industrial sectors. A large majority of the models aim at the public sector (18 out of 24), far ahead of the residential (10 out of 24) and commercial sector (9 out of 24). The industrial sector is aimed at by only 4 models, but mainly directed towards SMEs, showing the growing interest of setting up local initiatives for this particular market segment. Although the studied models do not represent all the initiatives implemented on the different market segments by local authorities in Europe, the dominance of the public sector may be explained by the greater ability to address its own buildings and facilities stock with a large scale program and also by the driven effect of EU directives that have imposed binding energy efficiency and renewable energy objectives onto the public authorities.

Fig. 6. Model Beneficiaries synthesis

Model Beneficiaries synthesis				
	Public	Commercial	Residential	Industrial
REDIBA	x			
Berlin Energy Saving partnership	x	x		
RE:FIT	x			
Vlaams Energiebedrijf	x			
OSER	x			
Fedesco	x			
Eandis EDLB	x			
ESCOLimburg 2020	x			
Eco'Energies		x		
Energy Fund Den Haag	x	x	x	x
Energies POSIT'IF			x	
Climate Community Saerbeck	x	x	x	x
Cambridgeshire MLEI	x	x		
Ox Futures	x	x		x
Rotterdam Green Buildings	x			
Energy Efficiency Milan	x			
ENSAMB	x			
Brixton Energy Co-op			x	
EERFS	x	x	x	x
SUNShINE			x	
Warm Up North	x		x	
SPEE Picardie			x	
KredEx			x	
PadovaFIT!	x	x	x	

Fig. 5. Beneficiaries addressed by the models



1.2. Implementation methodology

The implementation methodology is the method by which the projects are technically and operationally implemented in the field, most often by using contractors or subcontractors. Typical implementation models are Energy Performance Contracting, Energy Supply Contracting and Separate Contractor Based.

Separate Contracting Based (SCB) methodology

Separated Contracting Based is a method to implement multi-technique energy efficiency or renewable energy projects, by which each step of the process is dealt with by a separate party (energy auditor, engineering company, installer or contractor, maintenance company) and by which individual projects (e.g. boiler replacement, relighting, isolation, etc.) are executed by separate contractors for each technique.

This method is typically time consuming and requires a project coordinator to manage the process of getting all of the individual projects executed in a timely manner. For a public authority to use this method requires separate public tenders for each individual project. It requires also gaining a good knowledge of all the techniques involved in the field of energy efficiency and renewable energy, which is not easy. The method is therefore relatively resources and operational tools intensive and leads to more long completion times. In this method, the Program Delivery Unit (PDU) can act either as a facilitator or integrator (see below), but it can be useful to have the Program Delivery Unit (PDU) or another organization to act as an integrator to ensure an end-to-end delivery of the energy efficiency program and provide a consistent level of service from the different contractors.

A major disadvantage of this method is the fact that none of the subcontractors finally takes responsibility for the result of the global performance at the building or building stock level. This also means that the beneficiary or the Program Delivery Unit in case of integration takes on the technical and financial risks. Another disadvantage is the relatively high cost of transaction, meaning the cost of project design, procurement and management per euro invested. If they are not properly controlled, transaction costs can quickly represent a substantial share of achievable energy savings, reducing the potential scope of action of the model. In this method, there is also little room to access Third party financing (TPF).

Energy Performance/Supply Contracting (EPC/ESC) methodology

In the Energy Performance Contracting (EPC)/Energy Supply Contracting (ESC) methodology, the Program Delivery Unit (PDU) relies on private ESCOs (Energy Services Company) or specialized contractors competing for the signing of an Energy Performance Contract (EPC) or Energy Supply Contract (ESC) for one or several buildings/projects (in case of bundling/pooling and/or aggregation).

This is one project, one contract that includes all buildings/projects, measures and technologies. The ESCO/Contractor performs the audits (as part of its offer), studies, design and works (at the start of the contract) and then operates and maintains the facilities.

In the EPC case, the ESCO/Contractor delivers a performance guarantee on the energy savings and takes responsibility for the end results (technical and financial). The EPC contract is the contractual agreement by which the output-driven results are agreed upon. Other aspects like maintenance can also be integrated and potentially be performance based. Performance guarantees are associated with a bonus and penalty scheme. Measurement and Verification (M&V) and Monitoring are key features of successful EPC contracts. EPC contracts can include financing schemes in which the ESCO/Contractor acts as financier or investor, but the beneficiaries can also finance these with own funds or through a financial institution.

In the ESC case, the ESCO/Contractor delivers « useful » energy (e.g. heat, cold, steam, electricity) to the customer at a contractually agreed price per kWh. The ESCO/Contractor is in charge of dimensioning, engineering, installing and maintaining the local production installation (e.g. boiler, combined heat & power, photovoltaic solar panels) for the duration of the contract. It typically manages the production efficiency of the installation to optimize the cost of transformation of the fuel into useful energy. The price for the useful energy delivered typically includes a fixed component to cover for the investment of the installation and a variable component to cover for the fuel usage.

In the EPC/ESC method, the Program Delivery Unit (PDU) can act either as a project facilitator or project integrator (see below). The tasks are mainly project management and coordination of larger contracts; the method is therefore less resources and operational tools intensive than the Separate Contracting Based one. The EPC/ESC method has the major advantage of outsourcing to ESCO/Contractors the technical risks and financial results of the projects thanks to the guaranteed

energy savings or fixed price. This means that the beneficiary or the Program Delivery Unit in case of integration do not take on the performance risks of the projects. Another advantage of the method is the financial predictability of the projects thanks again to the guaranteed savings or fixed price. At the same time, experience shows that the transaction costs, meaning the costs of design and project management per euro invested could be lower than in the Separate Contracting Based method. Finally, the EPC/ESC methodology is also the key condition to access to ESCO and/or Third party financing (TPF).

What is the methodology used by the models?

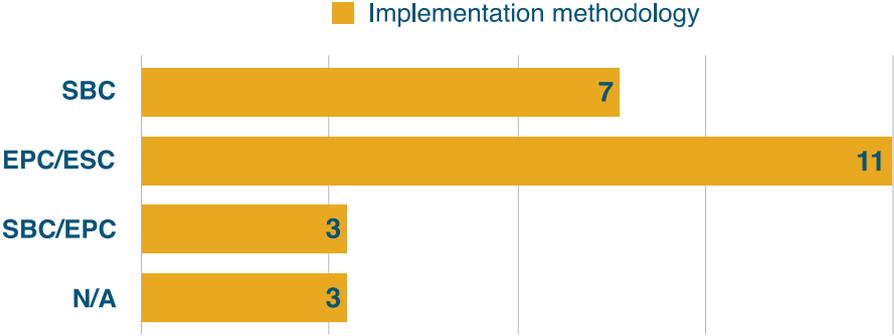
The figure 7 details the methodologies being used in the analysed models.

Fig. 7. Model implementation mapping



Amongst the 24 models analysed, 11 make use of the ESC/EPC implementation methodology while 7 make use of the SCB implementation methodology. 3 models use both methodologies. 3 purely financial models, which use investment funds or citizens funding to finance the program, do not use a specific implementation methodology, although customers of those funds will probably use one of both methodologies.

Fig. 8. Implementation methodologies in use



1.3. Operational services framework

The operational services framework addresses the type of services that can be offered by the Program Delivery Unit (PDU) to the beneficiaries of the program. The study identifies 7 levels of services that are proposed by the analysed models:

- Marketing;
- Assessment;
- Financial advice;
- Facilitation;
- Integration;
- Aggregation;
- Financing.

Figure 9 gives a short description of the operational services a Program Delivery Unit (PDU) can offer to the beneficiaries. The report details in this section the three main operational services facilitation, integration and aggregation while the financing services are detailed in the next section, the Financing framework.

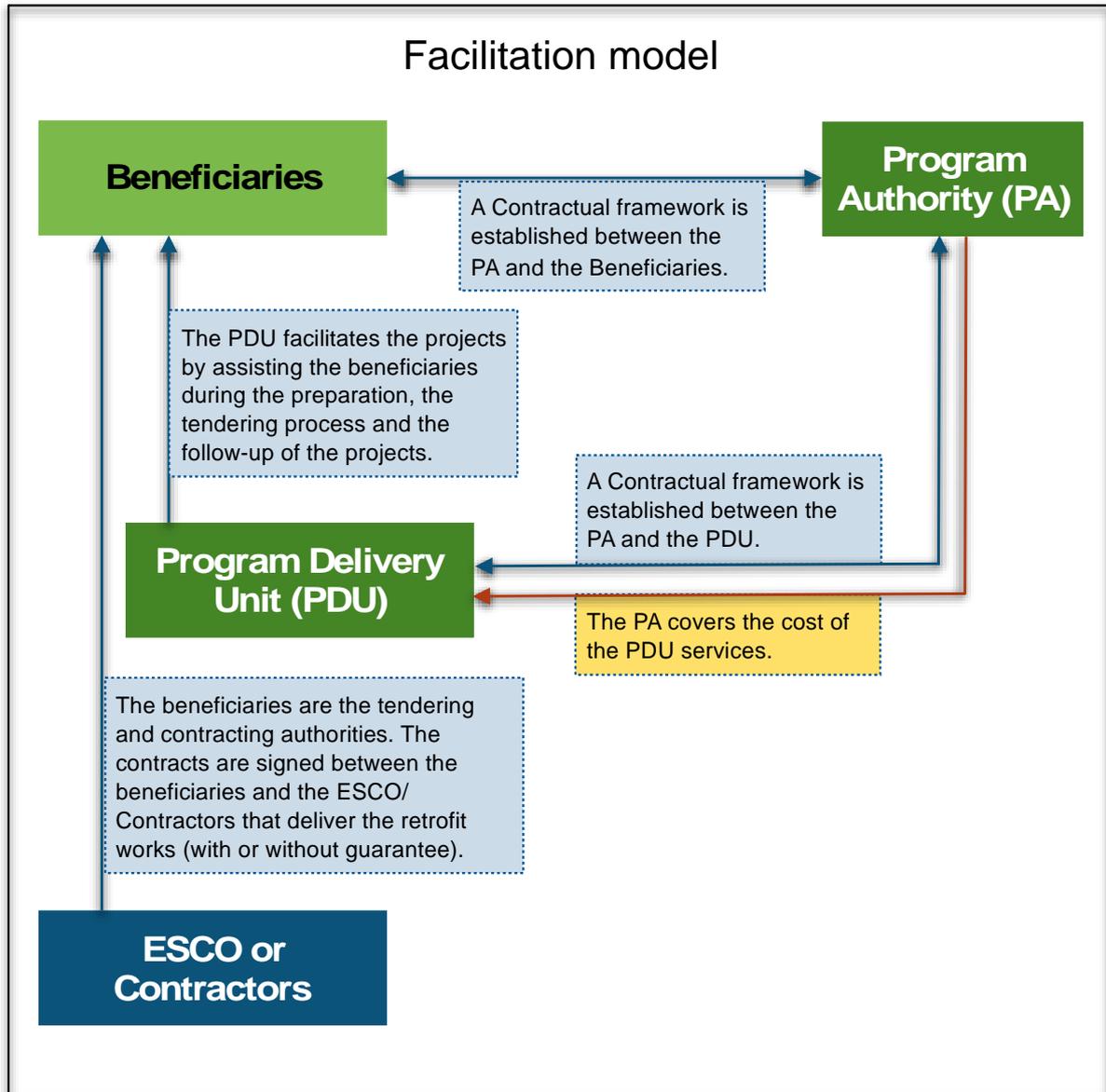
Fig. 9. Model services description

Model services description				
		Low	Level of services	High
		Standard services	Aggregation	Financing
Level of services	Low	Marketing Marketing covers the commercialization of the services of energy efficiency to the beneficiaries. This covers the whole range of communication and commercial development services that are necessary to inform the beneficiaries of the types of offerings that are available to them. It also covers the pricing policy and product/services development.	Aggregation means that the Program Delivery Unit (PDU) bundles the projects of multiple beneficiaries by acting on behalf of them and by making them available to the market. This role can be associated to the integration or facilitation services, in both cases, the PDU manages the costs allocation between the beneficiaries. A more advanced form of aggregation includes the bundling or pooling of buildings of various internal customers into one single project to increase the size of the project. Aggregation is done to create economies of scale both operationally and financially.	Financing means that the Program Delivery Unit (PDU) will itself provide financing, either through an own fund or by packaging external financing solutions into an integrated financing service. In this case the PDU takes on the financial risk of the projects. This option is typically used where a dedicated fund is created as part of the energy efficiency program.
	Assessment Assessment is the role by which the PDU evaluates the technical and financial viability of the projects and decides whether or not they get implemented and/or financed. The PDU will typically use a number of criteria to judge whether the project is acceptable or not.			
	Financial advice Financial advice means that the PDU provides guidance and consultancy to the beneficiary on available funding for his project. This may include financial engineering and assistance in the negotiation of the best available financing or even arrange for the financing to be put in place. This can also include help in obtaining grants or technical assistance subsidies.			
	Facilitation Facilitation means that the PDU does not sign the contracts with the beneficiaries, but coordinates or “facilitates” the whole process of projects delivery on behalf of the beneficiaries. In this case, the beneficiaries are the tender and contracting authorities and contracts for the delivery of the works are signed directly between them and the ESCO/contractors.			
	Integration Integration means that the PDU acts as an intermediary between the beneficiaries on one hand and the ESCO/contractors on the other hand. In this case, the PDU is the tender and contracting authority. Contracts for the delivery of the works are signed between the PDU and the beneficiaries and the PDU signs contracts with the ESCO/contractors. In this case, the PDU takes on the technical risks of the projects. In a later case, the PDU has back-to-back agreements with the beneficiary on one hand and the ESCO/contractors on the other hand.			
	High			

The Facilitation Model

Facilitation means that the Program Delivery Unit (PDU) acts as assistant to the project owner, but is not involved in the contractual level. The Program Delivery Unit (PDU) coordinates or “facilitates” the whole process of project delivery on behalf of the beneficiary while the contracts are signed directly between the beneficiary and the contractors. This model is often applied in case of the EPC/ESC implementation model, where the contract is signed directly between the beneficiary and the ESCO. Managing the tendering process is typically part of facilitation services offered in case of EPC or ESC projects.

Fig. 10. The Facilitation model

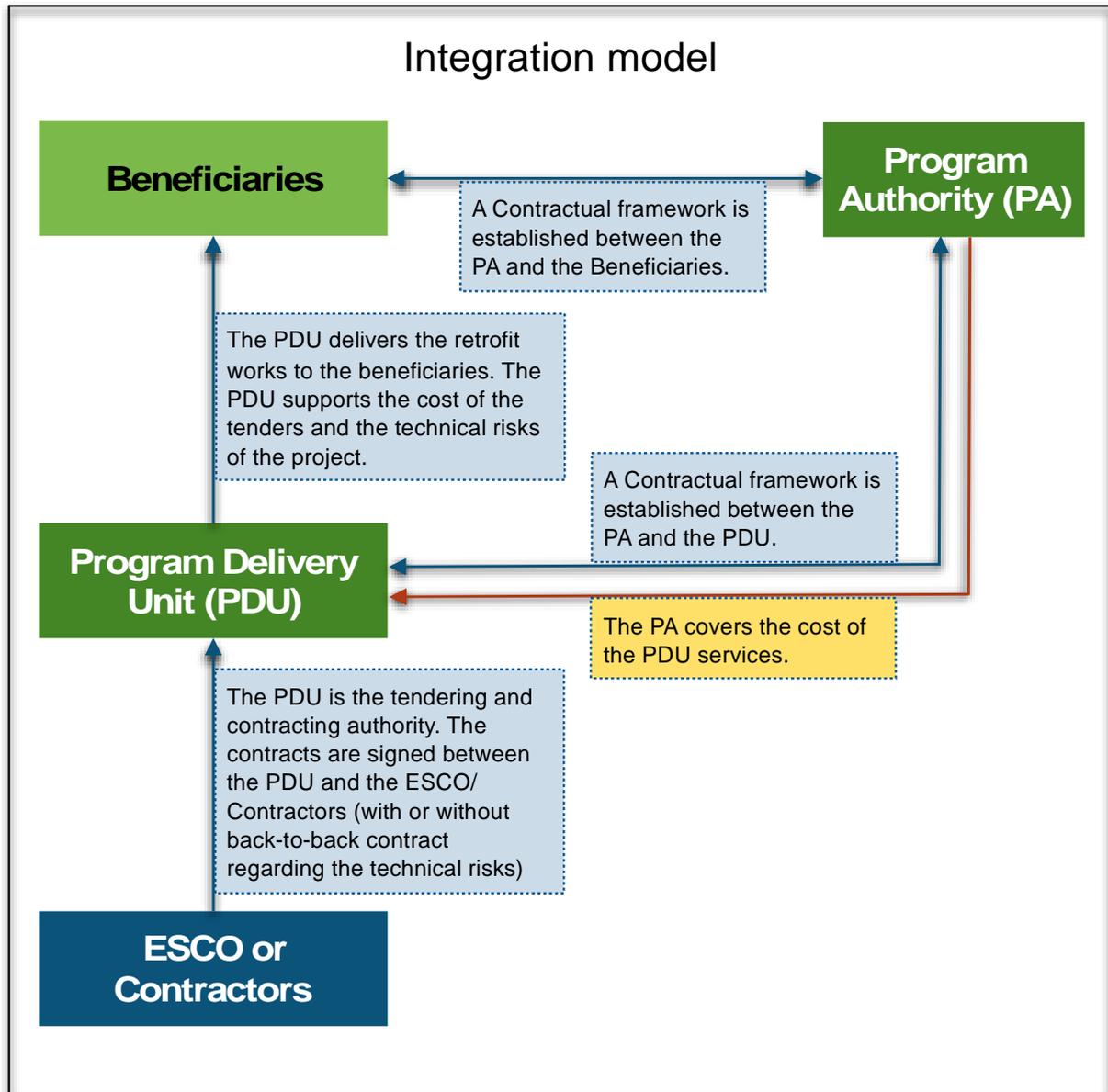


In the Facilitation model, the Program Delivery Unit (PDU) does not take on the technical and performance risks of the project; those remain on the beneficiary's shoulders or on the ESCO/Contractor (in case of the EPC/ESC implementation model). By definition, in the Facilitation model, the Program Delivery Unit (PDU) does not participate in the financing, but offers, in most cases, guidance to the beneficiaries to find the best financing solutions, either through ESCO's (see ESCO Financing Model) or banks and/or third parties. In the most advanced cases, the financing is integrated via a dedicated operator (Investment fund and/or Citizens funding platform) upstream of the facilitation services.

The Integration model

Integration means that the Program Delivery Unit (PDU) acts as an intermediary between the beneficiary on one hand and the contractors or subcontractors on the other hand. This means that the contract for the delivery of the energy efficiency is signed between the integrator and the beneficiary and that the integrator signs contracts with the (sub)contractors. In the Integration model, the Program Delivery Unit (PDU) takes on the technical and performance risks of the project, unless it has back-to-back agreements with the beneficiary on one hand and the ESCO on the other hand (in the case of the EPC/ESC model).

Fig. 11. The Integration model



A priori, the Integration Model also includes financing (see PDU Financing and Investment fund models), unless the beneficiary finances the project with equity or debt. For this reason, it needs much greater capital and debt capacity to finance the projects. If funding is also part of the integration, it is either the ESCO/Contractors that provides it, or it is subject to a separate implementation, with or without competition with banks and/or third parties.

The integration model is often associated with the Separate Contractor Based implementation model, although it can also be applied to EPC or ESC. The two cases are described below:

- The SCB Integration model: In the SCB integration model, the Program Delivery Unit (PDU) truly plays the role of integrator of a large number of stakeholders or subcontractors, for carrying out audits, studies, works or services, to offer a "packaged" solution to the beneficiaries. Its role is first to select these subcontractors, possibly putting them into competition; then make them execute their tasks. The job is essentially projects management and coordination, but nevertheless it requires a good knowledge of the different techniques used. Taking into account the complexity of energy efficiency projects, the adequate command of all techniques is not easy. This will require from the PDU strong quality control procedures and tools.

- The EPC/ESC Integration model: In the ESC/EPC Integration model, the Program Delivery Unit (PDU) acts on behalf of the beneficiaries and manages the project process from the tendering to the implementation and follow-up of the project. In this case, this is one project, structured around a "back-to-back" contract between the Program Delivery Unit and the ESCO/Contractor.

The Aggregation model

The aggregation model is a variation of the two previous models where the projects and/or the beneficiaries are bundled/pooled and/or aggregated in one or more larger project units:

- Bundling/pooling: Bundling/pooling means that the beneficiary or the Program Delivery Unit (PDU) bundles/pools the projects in one or more single projects to increase the size of the projects in order to make these feasible and/or to create economies of scale both operationally and financially. This approach could be applied either to the EPC/ESC methodology as well as to the Separate contracting methodology.
- Aggregation: Aggregation means that the Program Delivery Unit (PDU) bundles the projects or buildings of multiple beneficiaries into a single larger project. Aggregation is done to create economies of scale both operationally and financially. The aggregation service can include bundling/pooling of projects. This approach requires that the Program Delivery Unit (PDU) is entitled to act on behalf of the beneficiaries.

The figures 12 and 13 describe the application of aggregation to both Facilitation and Integration models.

Fig. 12. The integration/aggregation model

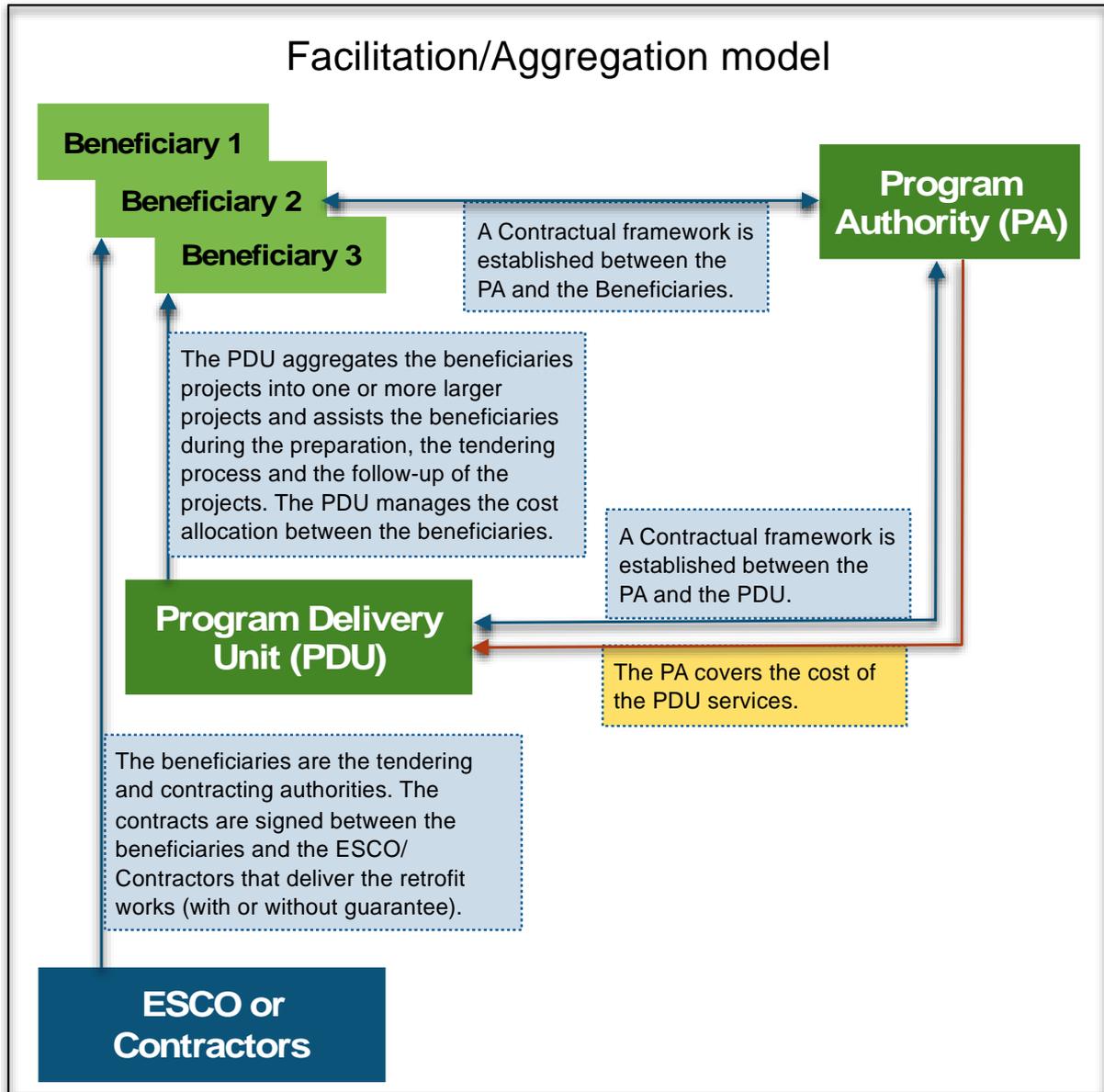
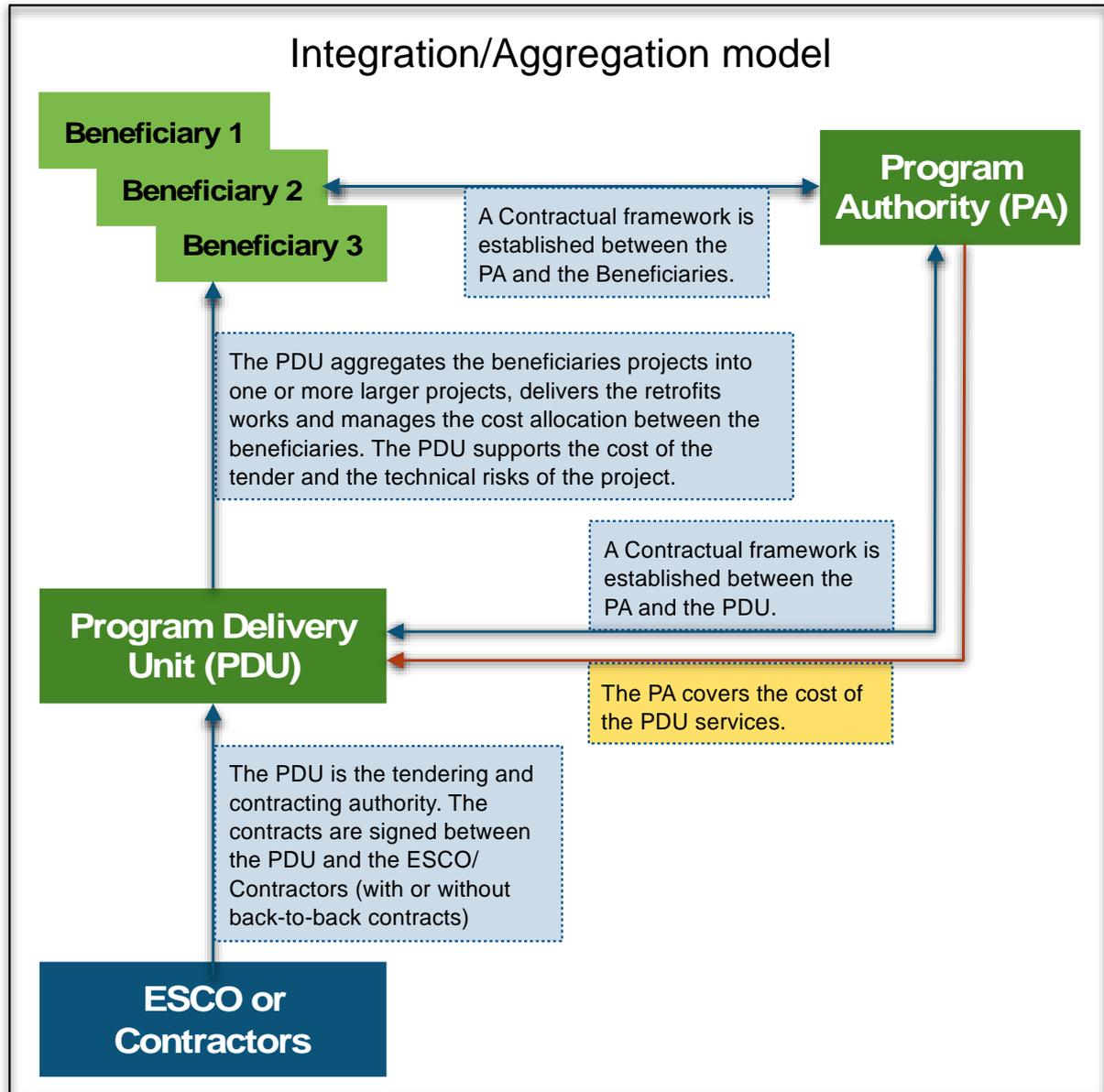


Fig. 13. The integration/aggregation model



What are the operational services offered by the models?

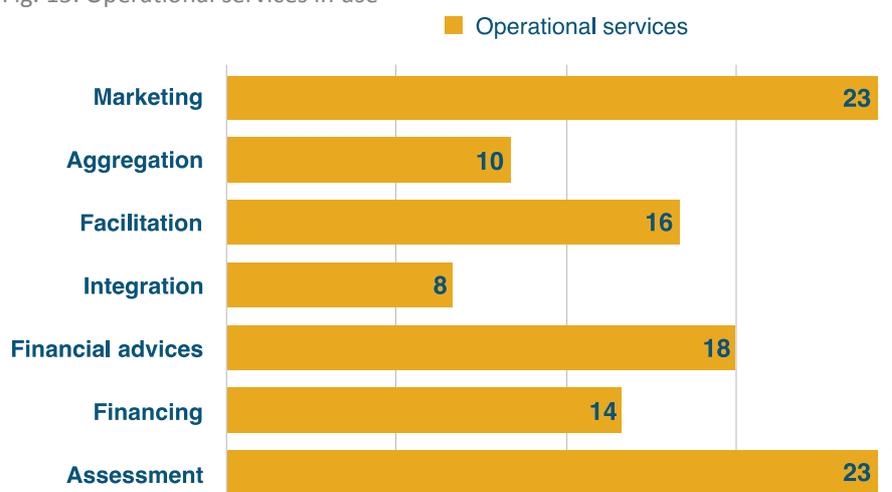
Figure 14 and 15 detail the operational services offered by the analysed models.

Regarding the operational framework itself, 16 models are applying facilitation against 8 for integration, while 15 of them are applying aggregation. Regarding the financing framework, while 18 models offer financial advice, about 14 models integrate the financing in their service scope, with 3 models that are offering financing services only. It is mainly the models applying integration that integrate also the financing. Almost all models offer marketing and assessment services (23 out of 24). It is mainly French and Belgian public authorities that have developed integration models with integrated financing, while the facilitation model with conventional and/or Third Party Financing is more common in other countries. The reason probably is that both countries have a stronger culture of integration of public services.

Fig. 14. The model services mapping

Model services mapping					
	Facilitation model		Integration model		Financing only model
	Without aggregation	With aggregation	Without aggregation	With aggregation	
Without integrated financing	REDIBA Eco'Energies	Berlin ESP RE:FIT Vlaams Energiebedrijf Energie POSIT'IF Rotterdam GB EE Milan ENSAMB PadovaFIT! Brixton Energy Co-Op	Warm Up North	-	N/A
With integrated financing	OSER Ox Futures EERFS SUNSHINE	Fedesco	OSER Eandis EDLB EscoLimburg 2020 Cambridgeshire MLEI SPEE Picardie	Fedesco Energie POSIT'IF	Energy Fund Den Haag KredEx Saerbeck

Fig. 15. Operational services in use



1.4. Financing framework

The Funding Vehicle is the entity or structure that is being used to finance the projects. Typically, the analysed models/programs make use of the following funding vehicles (or a combination of) :

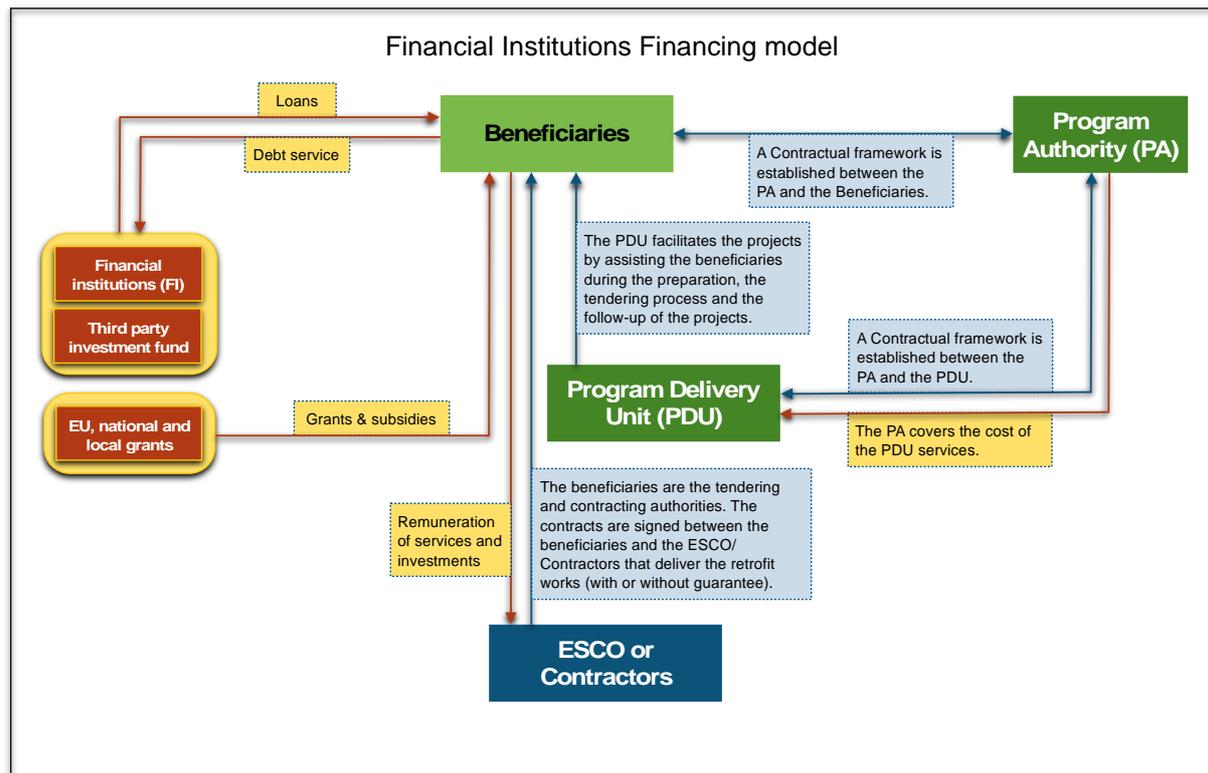
- Own funds
- FI Financing
- ESCO Financing,
- PDU Financing
- Investment fund

Note that own funds are not considered strictly speaking as a financing model, so it will not be addressed in these lines.

The FI Financing model

In this model, the beneficiaries make use of external financing solutions (financial institutions (FI), utility funds, etc.) in order to finance their projects. With the assistance of the Program Delivery Unit (PDU) the beneficiary signs the contract with an ESCO and/or contractor(s). The works are funded by the beneficiary that pays the ESCO and/or the contractor(s) directly at the time of their completion. In this case, the beneficiaries take on the financial risk of the project. The Program Delivery Unit (PDU) can support the beneficiary with financial advice and financial engineering services providing guidance and consultancy on available funding for his project.

Fig. 16. The FI Financing model



Key points:

- This financing scheme by the beneficiary is simple to implement and does not require particular arrangements from the Public Authority (PA) or the Program Delivery Unit (PDU). It does not mobilize the financial resources of the Public Authority (PA) or the Program Delivery Unit (PDU).
- The Program Delivery Unit (PDU) can provide financial advice and financial engineering services to the beneficiaries, in order to enhance their capabilities. In the most advanced models, the Program Delivery Unit (PDU) has negotiated particular financing conditions with financial institutions program partners.
- Nevertheless, this financing scheme might not allow to obtain favourable financing conditions (interest rate, financing terms, funding base) in comparison with an integrated financing scheme.
- From a practical point of view, the model involves managing the projects in parallel with contractors and fund providers (not a "one stop shop" solution), which will make the realization of projects less easy.
- Only projects and/or beneficiaries with an acceptable risk profile and debt capacity will find funding. This implies that the Program Delivery Unit (PDU) should be able to qualify the financial feasibility of the projects taking into account the financial risk profile and the debt capacity of the beneficiaries. The assessment service will be therefore decisive in the success of the program.

- The financing model does not overcome the limitations of debt capacity or financing terms of the beneficiaries, which de facto limits the feasible level of ambition and growing power capacity of the program.

Impact on the public balance sheet:

- The program authority does not support the funding of the projects neither the Program Delivery Unit (PDU), so for them there is no impact on the public balance sheet.
- If the beneficiaries are public organisations, investment will be recorded as gross fixed capital formation of public administration impacting negatively the public deficit upon its completion with an impact on public debt to the part of that investment financed by a public loan.

The ESCO Financing model

In this model, the ESCO or contractor acts as the funding vehicle, providing financing through either EPC financing or ESC financing. In this case, the ESCO takes on the financial risk of the projects. The Program Delivery Unit (PDU) can support the beneficiaries with financial advice and financial engineering services providing guidance and consultancy on ESCO financing for their projects.

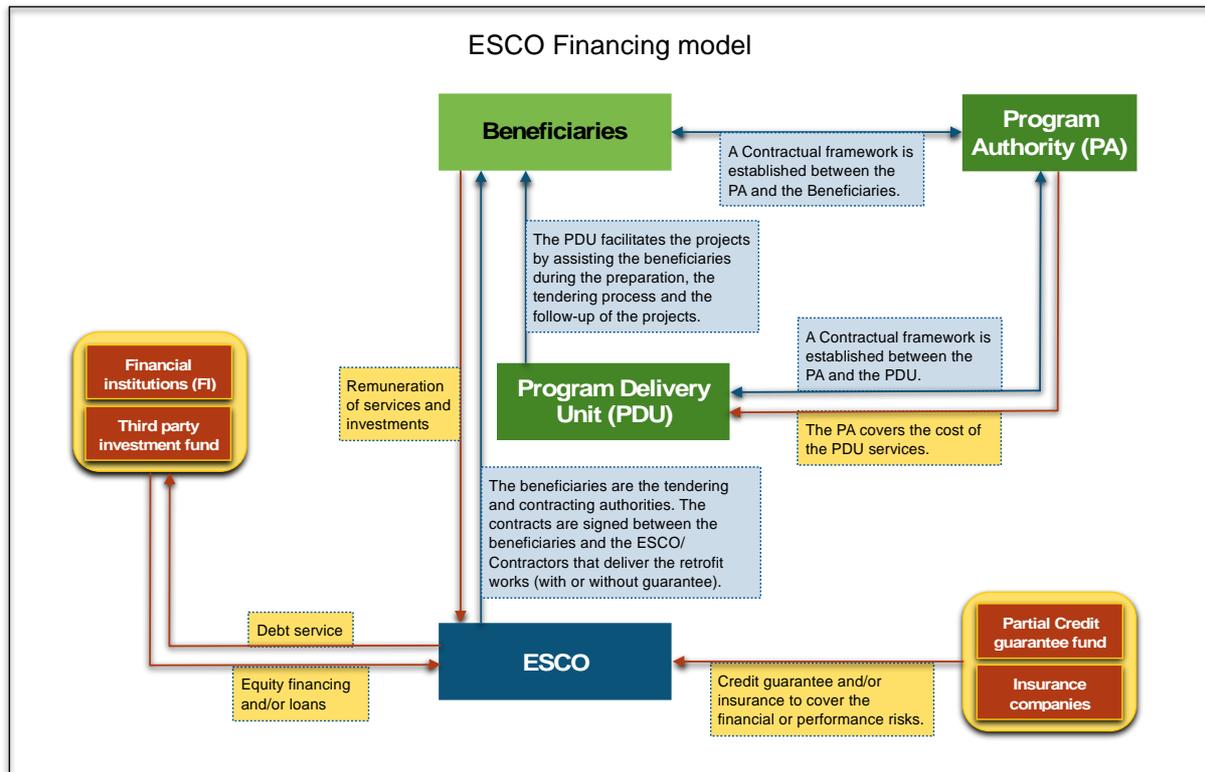
Two operational models can be applied to this financial scheme, facilitator or integrator:

- In the first case, the beneficiary signs the contract with the ESCO with the assistance of the Program Delivery Unit (PDU). The works (investments) are funded by the ESCO and/or his partner (Third Party Investor). To cover these investments, the beneficiary pays a rent (fixed or variable) to the ESCO, to reimburse the pre-financing of the works. In this configuration, the risks are fully taken on by the ESCO. This case is presented in the figure 17.
- In the second case, it is the Program Delivery Unit (PDU) that signs the contract with the ESCO on behalf of the beneficiary. The other elements of the scheme remain the same. In this case, the Program Delivery Unit (PDU) could investigate the opportunity to co-create with the ESCO a public-private owned Special Purpose Vehicle (SPV) to bundle contracts on a larger scale in order to gain in efficiency and financing costs (reaching a critical mass). Under some conditions, this structure could be deconsolidating for public accounts.

Key points:

- This ESCO financing scheme is rather simple to implement and does not require particular arrangements from the Public Authority (PA) or the Program Delivery Unit (PDU). It does not mobilize the financial resources of the Public Authority (PA) or the Program Delivery Unit (PDU).
- Nevertheless, the cost to fund the investment will be likely higher due to the repercussion of the cost of own financing of the ESCO and/or its partner (Third Party Investor) usually higher than for public bodies and the compensation for a greater risk taken by the ESCO and/or its partner (Investment pre-financing).
- From a practical point of view, the ESCO serves here as a “one-stop-shop”, which can help manage the projects. However, poor ESCO creditworthiness or the lack of a developed ESCO market might turn the search for ESCOs able to play this role of financier or investor or for third parties fulfilling that role particularly challenging.
- Only projects and/or beneficiaries with a solvent or profitable profile for the ESCO and/or its partner will find funding. This implies that the Program Delivery Unit (PDU) should be able to qualify the attractiveness of the projects for the ESCO market. The assessment service will be therefore decisive in the success of the program.
- The financing model overcomes the limitations of debt capacity of the beneficiaries, giving a better growing power capacity of the program, but it does not overcome the limitations of financing terms as ESCOs are not willing to finance long term contracts.

Fig. 17. The ESCO Financing model



Impact on the public balance sheet:

- The program authority does not support the funding of the projects neither the Program Delivery Unit (PDU), so for them there is no impact on the public balance sheet.
- If the beneficiaries are public organisations, even if the funding is provided by a third party, investment will still be recorded as gross fixed capital formation of public administration impacting negatively the public deficit upon its completion with an impact on public debt. The creation of a public-private Special Purpose Vehicle by the Program Delivery Partner (PDU) the ESCO and/or its partner could, under some conditions, minimize this impact.

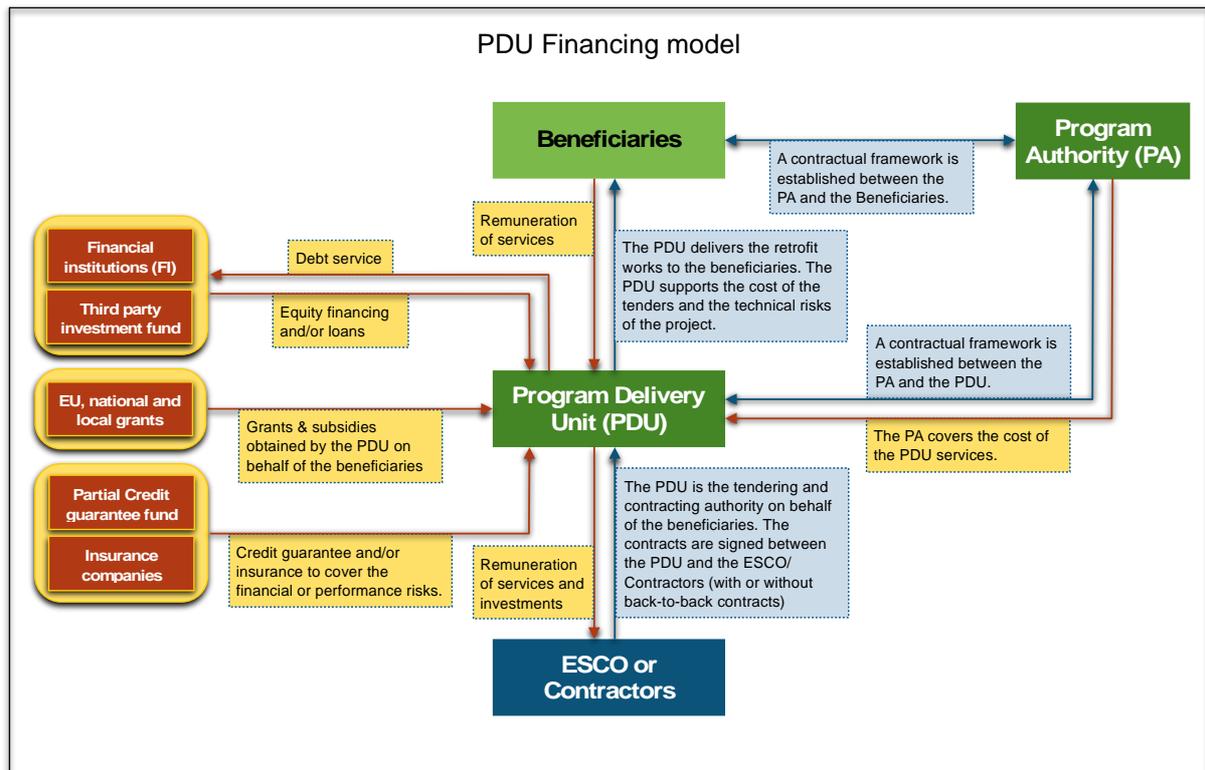
The PDU Financing model

In this model, the Program Delivery Unit (PDU) acts as the funding vehicle, providing financing, either through an own fund (or the Investment fund) or by packaging external financing solutions into an integrated financing service. In this case, the Program Delivery Unit (PDU) acts as a financier or investor for the beneficiaries and takes on the financial risks of the projects.

Two operational models can be applied to this financial scheme: facilitator or integrator:

- In the first case (integration), the Program Delivery Unit (PDU) signs the contract with the ESCO and/or the contractor on behalf of the beneficiary. The works are funded by the Program Delivery Unit (PDU) that pays the ESCO and/or contractor(s) directly at the time of their completion. To cover these investments, the beneficiary pays a rent (fixed or variable) to the Program Delivery Unit (PDU), to reimburse the pre-financing of the works. In this configuration, the Program Delivery Unit (PDU) takes all risks on, financial and technical. This case is presented in figure 18.
- In the second case (facilitation), it is the beneficiary that signs the contract with the ESCO and/or contractor(s) with the assistance of the Program Delivery Unit (PDU). The other elements of the scheme remain the same. In this configuration, the risks are shared between the parties: the beneficiary takes the technical risks on while the Program Delivery Unit (PDU) takes the financial risks on.

Fig. 18. The PDU Financing model



Key points:

- This financing scheme requires from the Public Authority (PA) to provide sizeable equity and debt capacity to the Program Delivery Unit (PDU) to match the ambitions of the program. The Program Delivery Unit (PDU) will also have to integrate financial expertise to optimize its risks.
- This financing scheme by a public body will generally benefit from more favourable financing conditions (interest rates, financing terms, funding base,...) as compared to a conventional or ESCO financing scheme.
- From a practical standpoint, setting up projects is greatly facilitated, as there is a « one stop shop" solution, certainly in the Integration model.
- The Program Delivery Unit (PDU) can optimize the cost and financial risks on a larger projects portfolio, allowing the addressing within the program of less profitable projects or more risky beneficiaries.
- Depending on the leverage capacity of the Program Delivery Unit (PDU), the financing scheme overcomes the limitations of debt capacity or financing terms of the beneficiaries, which potentially allows a greater level of ambition and growing power capacity of the program.
- Achieving a critical mass through a structure of this type would also allow large institutional partners such as the European Investment Bank or the European Energy Efficiency Fund (EEEF) to enter more easily in. One example is the Energies POSIT'IF model that reported a structural agreement with the European Investment Bank as part of a global 400 million € financing program for residential homes in France.

Impact on public balance sheet:

- The Program Authority (PA) will have to provide the equity financing of the Program Delivery Program (PDU), so there is an impact on the public balance sheet.
- As the Program Delivery Unit (PDU) finances the works/investments, these will be recorded as gross fixed capital formation of public administration impacting negatively the public deficit upon its completion with an impact on public debt.

The Investment Fund Financing model

In this model, the Program Authority (PA) or the Program Delivery Unit (PDU) set-up a public, public-private or public-citizens fund to provide total or partial project financing of the program. The fund

can work on a stand-alone basis, in cooperation with the Program Delivery Unit (PDU) or be integrated into the Program Delivery Unit (PDU). In all cases, the fund takes on the financial risk of the project.

This financing scheme is similar in principle to that of the third investor presented in the PDU Financing model, with the notable difference that this time an investment fund or Special Purpose Vehicle (SPV) replaces the PDU as a third investor (see fig 19). In a more limited way, the fund can also provide a "credit guarantee" in additional funding or be limited to securing funding for the beneficiary or the ESCO/Contractors. One example is the EERSF fund in Bulgaria that procures soft loans, equity and credit guarantees to beneficiaries and/or ESCO's. Another example is the KredEx model that organises the funding with soft loans through a partnership with commercial banks.

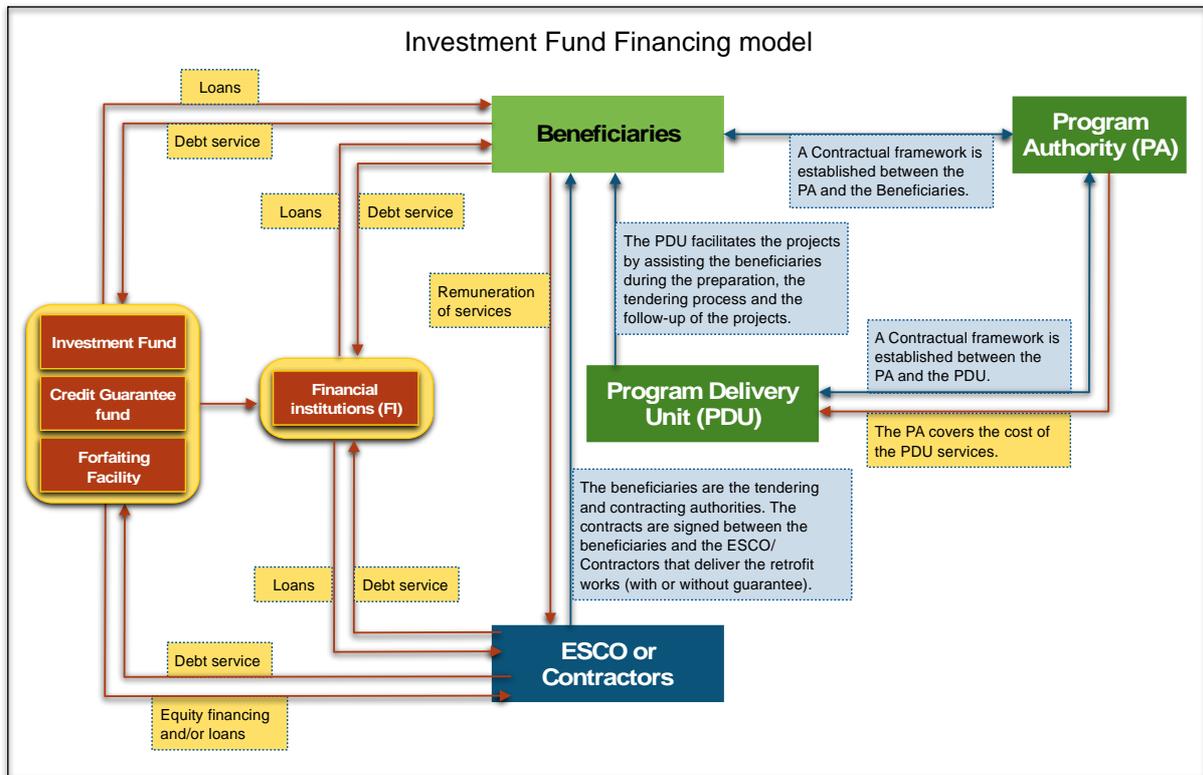
Key points:

- This financing scheme is particularly appropriate to consolidate the management and financing of different projects within the same entity. This approach should allow gains in efficiency and financing costs (which would furthermore be maximized if projects were homogeneous).
- Achieving a critical mass through a structure of this type would also allow large institutional partners such as the European Investment Bank or the European Energy Efficiency Fund (EEEF) to enter more easily in.

Impact on public balance sheet

- The Public Authority (PA) will have to provide the equity shareholding, so there is an impact on the public balance sheet.
- If the Program Authority (PA) is shareholder of the fund, it must do so as a minority shareholder and/or without the fund control to avoid automatic consolidation of the fund debt in the public accounts. One example is the Energy Fund Den Haag model.
- If the beneficiaries are public organisations, even if the funding is provided by a third party, investment will still be recorded as gross fixed capital formation of public administration impacting negatively the public deficit upon its completion with an impact on public debt. Nevertheless, the proper creation of the fund could, under some conditions, minimize this impact.

Fig. 19. The Investment Fund Financing model



What are the funding vehicles used by the models?

Figure 20 details the operational services that offer the analysed models.

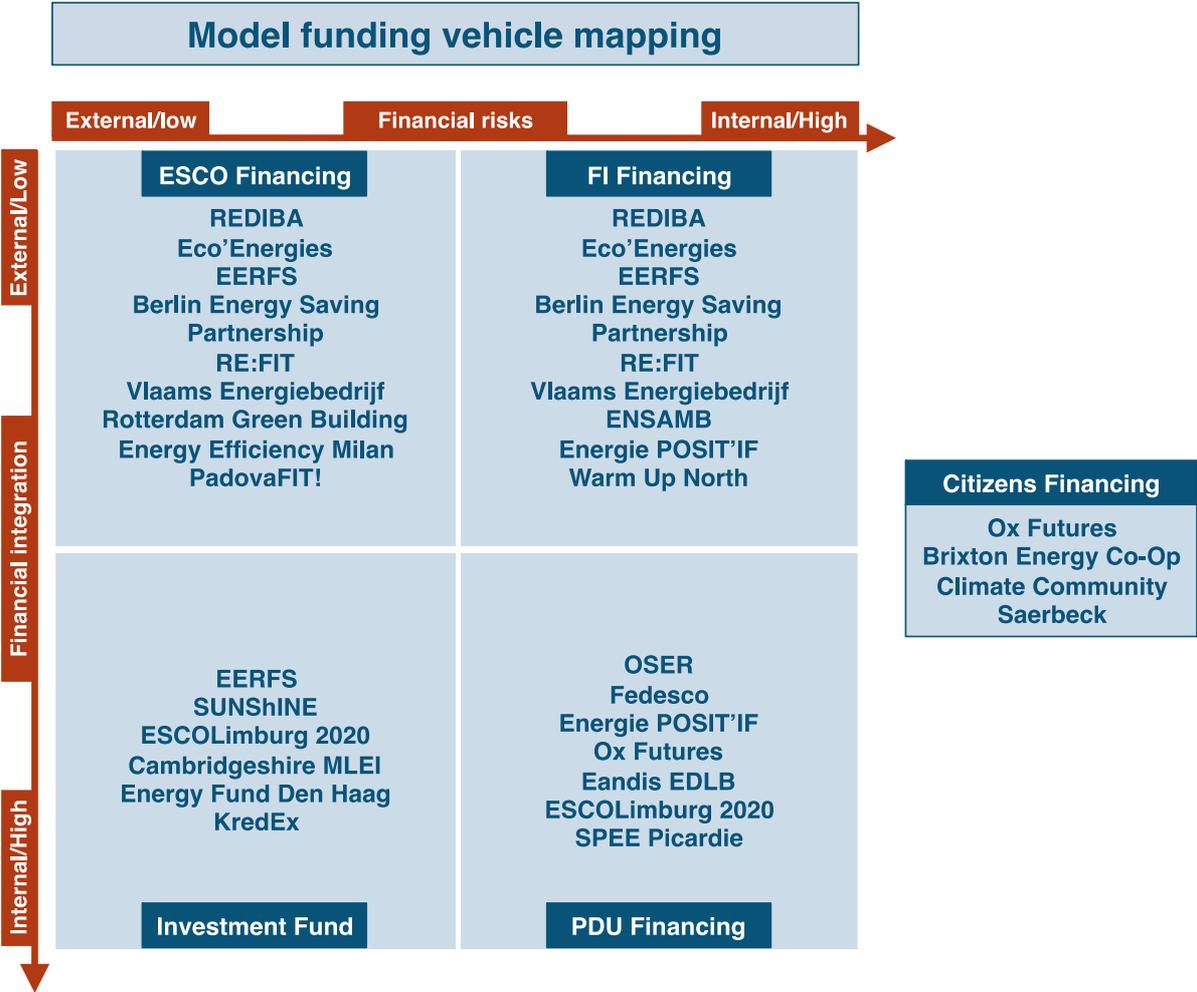
As shown in Figure 20, the models that use the different available funding schemes are rather highly distributed, with no dominant concentration around any particular funding vehicle. In practice, most models use several financing schemes, with more or less variations and degrees of complexity. We refer to the detailed files of the models for a better understanding of variations and complexities implemented.

However, it appears from the mapping that models involving facilitation are mainly financed via Financial Institutions or ESCOs while models using integration are mainly financed through the Program Delivery Unit (PDU) or an investment fund, confirming that each model has a specific and different philosophy.

It should be noted that only three models have implemented a clear citizens financing scheme. All three models focus solely or primarily on programs dedicated to the development of renewable energy at the local level, mainly green power (wind and/or solar photovoltaic). The different subsidy mechanisms (feed-in tariff or Green Certificates) established in member countries to support the development of green power production in EU favoured the implementation of citizen financing operations under the impulse of local authorities who intended to allow their citizens to benefit from the available grants schemes. A large number of citizen funding programs have thus been implemented in Europe, based on similar models to those presented here. However, the Saerbeck model is to be pointed out for its high level of integration and particularly pushed level of completion. It is also the only of the 24 analysed models to address the level of ambition of carbon neutrality. As for purely energy efficiency projects, particularly the renovation of buildings, the study has not

identified a lot of mature citizen funding initiatives to date, with the notable exception of the Brixton model which capitalized a share of the revenues generated by the citizen funding of renewable power projects to create a fund dedicated to financing renovation projects. This is certainly a way to go, as long as the green power feed-in tariff and/or Green Certificate mechanisms in Europe persist at current levels.

Fig. 20. Model funding vehicle mapping



2. Synthesis

2.1. Models positioning matrix

Figure 21 shows the model positioning synthesis.

Fig. 21. Model positioning synthesis

Model positioning synthesis					
	Facilitation model		Integration model		Financing only model
	Without aggregation	With aggregation	Without aggregation	With aggregation	
FI financing (*)	REDIBA Eco'Energies EERFS	Berlin ESP RE:FIT Vlaams energiebedrijf ENSAMB Energie POSIT'IF	Warm Up North	-	N/A
ESCO financing	REDIBA Eco'Energies EERFS	Berlin ESP RE:FIT Vlaams energiebedrijf Rotterdam GB EE Milan PadovaFIT!	-	-	N/A
PDU financing (**)	OSER	Fedesco Ox Futures	OSER	Fedesco Energie POSIT'IF Eandis EDLB EscoLimburg 2020 SPEE Picardie	N/A
Investment fund	EERFS SUNSHINE	-	-	EscoLimburg 2020 Cambridgeshire MLEI	Energy Fund Den Haag KredEx
Citizens financing	-	OxFutures Brixton Energy Co-op	-	-	Saerbeck

2.2. Requirements and impact on public balance sheet

Impact on public balance sheet

Figure 22 shows the model requirements and impact on public balance sheet.

The impact on the public balance sheet is a measure for whether the financing solutions that are implemented in the model generate more or less increase in public debt and allow or not public debt deconsolidation. This refers to ESA (European System of National and Regional Accounts) neutrality. It can be low, moderate or high. This must be understood as the impact on the balance sheet of the retrofit program initiator, either the Public Authority (PA) or the Program Delivery Unit (PDU) when it is predominantly public authorities owned.

The impact on the balance of beneficiaries is not considered in this section. It has nevertheless been addressed in the section Financing Framework above.

The reader will be warned however that the majority of analysed models are aimed at public beneficiaries who are inherently subject to EU rules on public debt consolidation. It appears from the analysis that the development of a deconsolidating financing model in the field of large-scale building retrofit programs is not yet a reality in the current context. Apart from some models such as Den Haag and Cambridgeshire MLEI, virtually very few models present an arrangement with a potentially deconsolidating framework. The same goes for the financing of Energy Performance Contracts (EPC), which currently offers few opportunities for the public sector to keep the financing of the investments off-balance, even if third parties or ESCOs fund them. We refer the reader to that effect to the guidance note on the accounting for energy performance contracting in the public accounts published by Eurostat dated August 7, 2015.

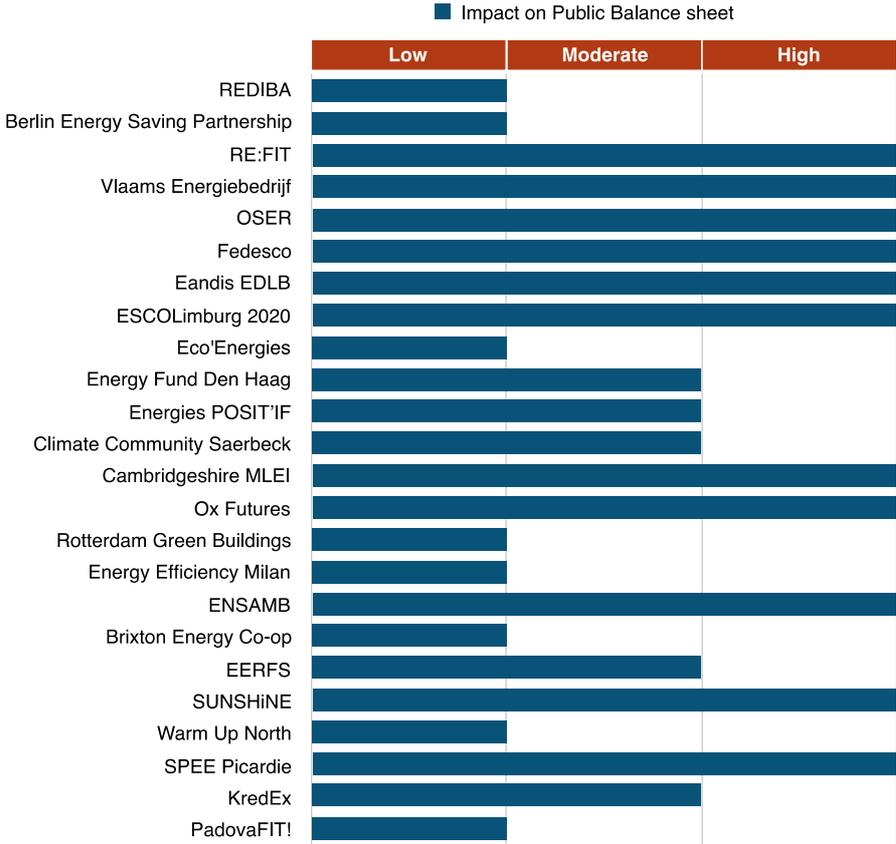
Fig. 22. Model requirements and impacts synthesis

	Impact on public balance sheet	Staff requirements	Equity requirements
Ox Futures	High	High	Moderate
RE:FIT	High	High	Moderate
Vlaams Energiebedrijf	High	Moderate	Moderate
ENSAMB	High	Moderate	Low
SUNSHINE	High	Unknown	Not applicable
EERFS	Moderate	Low	High
REDIBA	Low	Moderate	Moderate
Berlin Energy Saving Partnership	Low	Moderate	Moderate
Rotterdam Green Buildings	Low	Moderate	Moderate
Energy Efficiency Milan	Low	Moderate	Moderate
Brixton Energy Co-Op	Low	Moderate	Unknown
Eco'Energies	Low	Low	Low
PafovaFIT!	Low	Unknown	Moderate
Fedesco	High	High	Moderate
Eandis EDLB	High	High	Unknown
OSER	High	Moderate	Moderate
ESCOLimburg 2020	High	Moderate	Unknown
SPEE Picardie	High	Unknown	High
Cambridgeshire MLEI	High	Low	Low
Energies POSIT'IF	Moderate	High	Moderate
Warm Up North	Low	Unknown	Unknown
Energy Fund Den Haag	Moderate	Low	Moderate
KredEx	Moderate	Low	High
Climate Community Saerbeck	Moderate	Moderate	Moderate

Facilitation model	Integration model	Financing only model
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Eight models only have a low impact on the public balance sheet. These are mainly facilitator models without integrated funding. The sixteen other models have an impact on the public balance sheet from moderate to high. These models are characterized by a need for greater public funding, either because they incorporate funding, or because they have reached a more advanced stage of development.

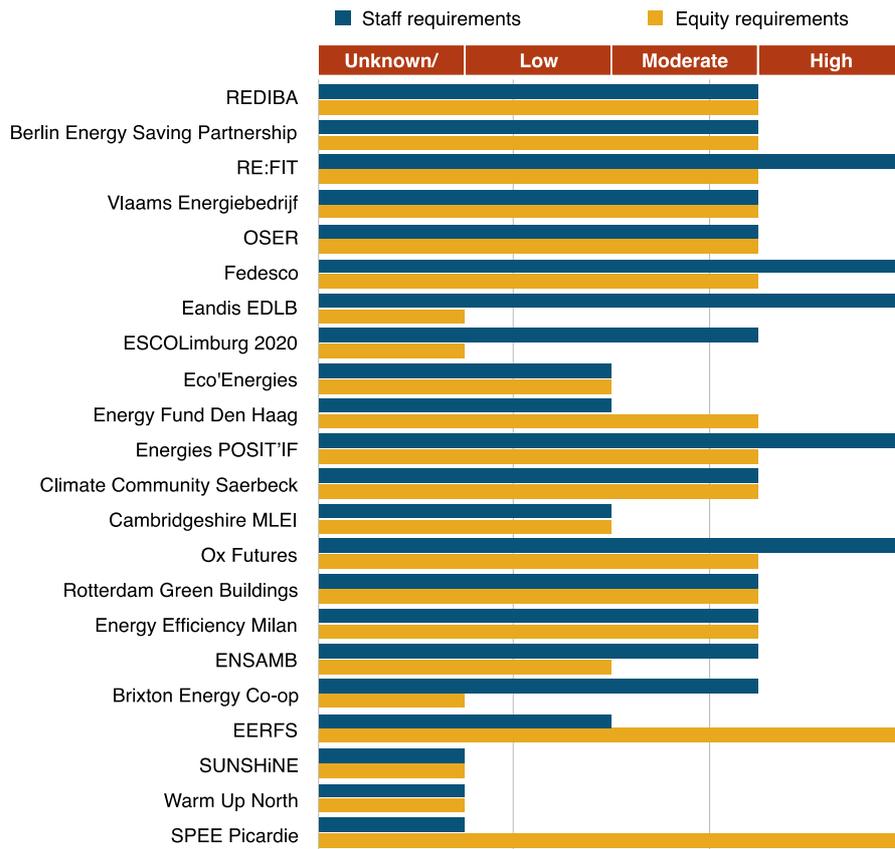
Fig. 23. Impact on public balance sheet



Staff and equity requirements

Figure 24 shows the staff and equity requirements for each models. With the notable exception of Eco'Energies and Cambridgeshire MLEI, most models require rather significant staff and equity resources, ranging from moderate (over 5FTE; over 1 million €) to high (over 10FTE; over € 10 million). The staff and equity requirements, however, are directly dependent on the projects volume managed by the model and the development stage in which it is, so it is not recommended to draw conclusions on these criteria. Nevertheless, it should be noted that at a similar projects volume and stage of development, the integration model is likely to require more financial and staffing resources. According to a study conducted in 2011 by Energinvest, for the same volume of planned investment, the integration model would require twice the amount of operating expenses than the facilitation one. As an illustration, the operating costs of an integrator were estimated at 1.2 million € year for an investment volume target of € 20 million.

Fig. 24. Staff and equity requirements



2.3. Scalability, development maturity and other criteria

Figure 25 shows the model scalability and development maturity with other criteria.

All models offer significant growth potential and are in essence for most replicable. The most relevant indicators for replication however are the scalability and the development maturity of the models.

As shown in the scalability/development maturity matrix in figure 26, integrator models offer inherently a lower scalability as the growing workload of integration is directly proportional to the volume of managed projects, which requires more staff and financial resources to ensure the growth. This observation is directly reflected in the requirements in terms of staff and equity for these models (see figure 24). These models have also not yet reached their maturity and are for most of them in a growth phase, either because they have been implemented more recently, or precisely because of their slower growth.

Facilitator models offer essentially a higher scalability, with corollary less need for staffing and financial resources. These models are also at a more mature stage of development by their ability to rapidly reach cruising speed. However, it will be necessary to further analyse the rate of waste projects generated by facilitator models, as all projects initiated do not lead to a realization. However, the same applies for some integrator models. It should be noted that the financing only models have also a very good potential for scalability and maturity.

Fig. 25. Scalability and development maturity

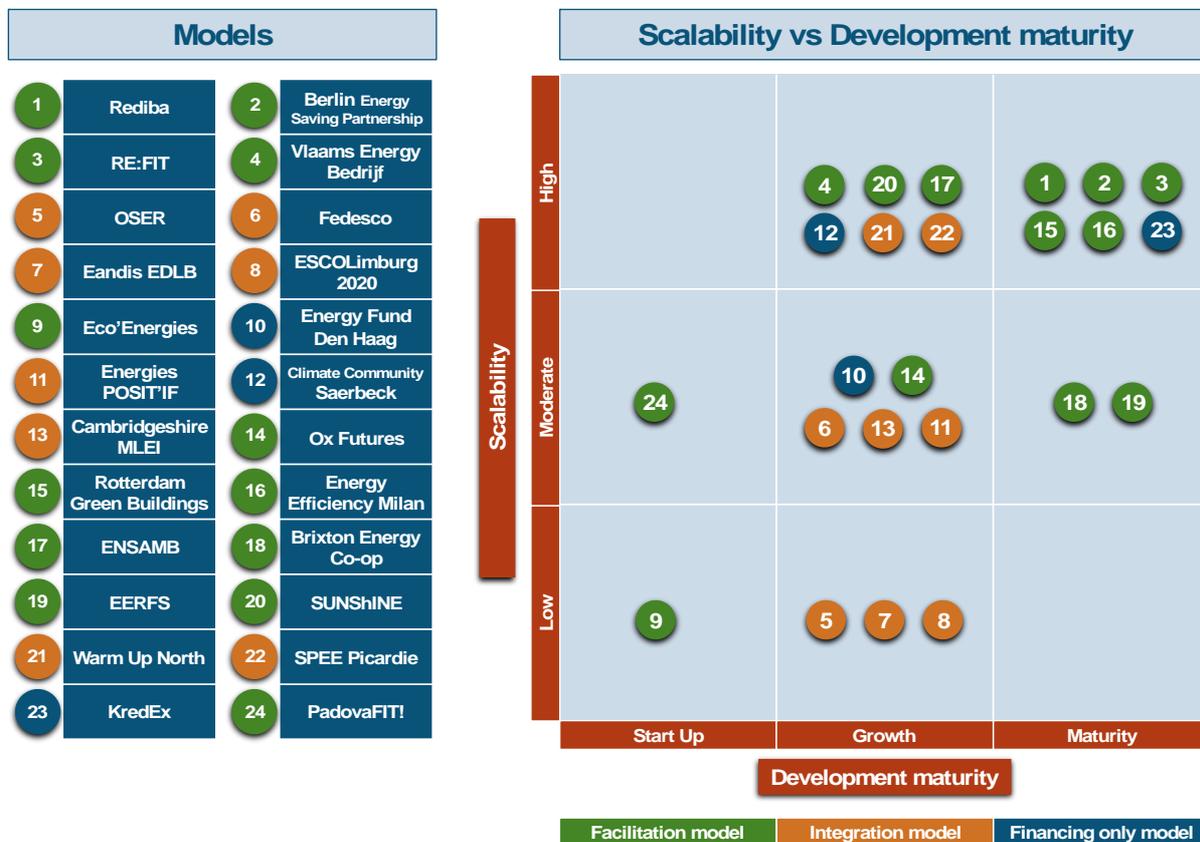
	Level of establishment	Development maturity	Scalability	Growth potential	Replicability
RE:FIT	Well established	Mature	High	Large	High
REDIBA	Well established	Mature	High	Large	High
Berlin	Well established	Mature	High	Large	High
Rotterdam Green Buildings	Well established	Mature	High	Large	Moderate
Energy Efficiency Milan	Well established	Mature	High	Large	High
EERFS	Well established	Mature	Moderate	Medium	Moderate
Brixton Co-Op	Well established	Mature	Moderate	Medium	High
Vlaams Energiebedrijf	Few examples	Growth	High	Large	Moderate
ENSAMB	Few examples	Growth	High	Large	High
Sunshine	Few examples	Growth	High	Large	High
OxFutures	Few examples	Growth	Moderate	Large	Moderate
PafovaFIT!	Well established	Start-Up	Moderate	Large	High
Eco'Energies	New model	Start-Up	Low	Large	High
SPEE Picardie	Few examples	Growth	High	Large	High
Warm Up North	Well established	Growth	High	Large	High
Fedesco	Few examples	Growth	Moderate	Large	Moderate
Cambridgeshire MLEI	Few examples	Growth	Moderate	Medium	Moderate
Energies POSIT'IF	Few examples	Growth	Moderate	Large	Moderate
Eandis EDLB	Few examples	Growth	Low	Large	Moderate
OSER	Well established	Growth	Low	Large	High
ESCOLimburg 2020	Few examples	Growth	Low	Large	Moderate
KredEx	Well established	Mature	High	Medium	High
Climate Community Saerbeck	Well established	Growth	High	Medium	Moderate
Energy Fund Den Haag	Few examples	Growth	Moderate	Large	High

Facilitation model

Integration model

Financing only model

Fig. 26. Scalability vs. development maturity matrix



2.4. Challenges and risks of each model

For the reader interested to start a large scale financing retrofit program, the question comes down to what kind of model needs to be implemented. The choice concentrates around a financing only model, a facilitator or integrator model, with or without aggregation, with or without integrated funding (either via a PDU or via an investment fund).

Both models, integration and facilitation, have many things in common: providing an expertise to the beneficiary, the management of common tasks (project management, technical specifications drafting, negotiation, project monitoring, etc.). The main difference is the beneficiary's contractual commitment with respect to the management of technical, operational, legal and financial risks. The challenges and risks for both models are not the same.

Integration model

Challenges :

- Whether or not the model incorporates financing, the main issue of the integrated model is basically the control of the energy efficiency retrofitting value chain and this in accordance with the time, cost and service guarantee offered to beneficiaries. Emphasis will be placed on the development and management of technical and operational tools and processes.
- Other issues are the acquisition of technical knowledge, business development and aggregation of demand and the effective management of the beneficiaries portfolio.
- Since it incorporates financing (either via the Program Delivery Unit or via an investment fund), another main issue of the integrated model will be access to adequate and sizeable funding sources to ensure business growth either through its shareholders and lenders, or through financial institutions and/or large institutional players such as the European Investment Bank (EIB), the European Energy Efficiency Fund (EEEF) or other European funds or funding programmes.

Risks :

Due to its contractual position with the beneficiary, the integration model is exposed to:

- Commercial risk (identify and support projects with a critical size) ;
- Economic risk (economic failure of the beneficiary) ;
- Technical risk (design, implementation, operation) ;
- Contractual risk (performance guarantee) ;
- Financial risk (if the model includes funding) ;

The strategic attractiveness of the integrator model is very high (one stop shopping solution, especially if it integrates the financing) but its risk exposure is higher (See below Fig. 27 attractiveness/risks matrix).

Development perspectives :

The integration model will have to find the necessary technical expertise and develop multiple partnerships with subcontractors, ideally through framework agreements, which take a long time, but the duration of implementation of individual projects will be shorter.

Fig. 27. Attractiveness vs. risks matrix



Facilitation model

Challenges :

- The main challenge for the facilitator is to create an enabling environment for beneficiaries, an appropriate contractual and operational framework, provide tools and standardized contractual models (e.g. EPC standard contracts) and establish procedures for control and verification of the works and services of ESCO/Contractors.
- As in the integration model, business development and aggregation of demand are essential, as they determine to a large extent the success of the program.
- Since it incorporates financing (either via the Program Delivery Unit or via an investment fund), another main issue of the facilitator model will be the access to adequate and sizeable funding sources to ensure business growth either through its shareholders and lenders, or through financial institutions and/or large institutional players such as the European Investment Bank (EIB), the European Energy Efficiency Fund (EEEF), or other European funds or funding programmes.

Risks :

The facilitation model takes almost no risk mentioned above, as it offers a guarantee of means (best effort) and not of result. The risks are:

- Follow the market practices without supporting or carrying on the projects (left to the authority or the beneficiaries) and ultimately resulting in not meeting the program objectives.
- Remain an « advisory shop » that beneficiaries will turn away from if they are not able to find sources of financing either through banks or through the ESCO/Contractors.
- Economic and financial risk (if the model includes funding)

The strategic attractiveness of the facilitation model is lower (not a one stop shopping solution) but its risk exposure is also lower (See below figure 27 attractiveness/risks matrix).

Development perspectives :

The facilitation model will be fast to start operating the first projects because the expertise to develop is less significant. Nevertheless, the implementation of the projects might be longer as mastering of the decision-making chain is more complex. Overall, the ramp-up of the facilitation model will still be faster as it will make a greater use of the resources and the capacity building of the beneficiaries.

Financing only model

Challenges :

- The main issue of the financing only model is to be found in the access to adequate and sizeable funding sources to ensure business growth either through its shareholders and lenders, or through financial institutions and/or large institutional players such as the European Investment Bank (EIB) or any other European funds or funding programmes.
- Other issues are the development of robust and efficient assessment procedures, the business development and aggregation of demand and the effective management of the beneficiaries' portfolio.

Risks :

Due to its contractual position with the beneficiary, the financing only model is exposed to:

- Commercial risk (identify and support projects with a critical size)
- Economic and financial risk

The strategic attractiveness of the financing only model is medium to highly attractive (not a one stop shopping solution) but its risk exposure is also medium to high (See above figure 27 attractiveness/risks matrix).

Development perspectives :

The financing only model will have to develop partnerships with potential intermediaries (e.g. commercial banks or commercial intermediaries), ideally through framework agreements, which can speed up the program development, but the duration of implementation of individual projects will be highly dependant of the beneficiaries' capabilities. However, the ramp-up of the financing only model could be quick as it can make use of the resources and the capacities of the beneficiaries.

Section 2 – Models in detail



Model 1

Renewables and Energy Efficiency Diputación de Barcelona - REDIBA

Province of Barcelona – Spain

OWNERSHIP	PUBLIC
Program authority	Diputación de Barcelona (Barcelona Provincial Council)
Program Delivery unit	REDIBA TA (REDIBA Technical Assistance Unit)
Implementation Model	Energy Performance Contracting (EPC) Energy Supply Contracting (ESC)
Operating Services	Marketer Facilitator Financial advisor Assessor
Type of projects	Public Lighting Solar Thermal Energy District Heating Biomass Energy Efficiency (building retrofits)
Ambition/targets	Implementation of sustainable energy measures in the Province of Barcelona at no cost or debt to the municipalities with an investment objective of 50M€.
Beneficiaries	Municipalities and provincial authorities within the Province of Barcelona
Funding Vehicle	ESCOs Property Owners (Municipalities)
Financial Instruments	EPC Financing ESC Financing Renting/Leasing Grants

Summary

REDIBA, which stands for Renewables and Energy Efficiency Diputación de Barcelona, is a project created by the Barcelona Provincial Council (DIBA) to support the local and provincial authorities in the Province of Barcelona carrying out their committed Sustainable Energy Action Plans (SEAP). It started in a setting where the municipalities had the duty to provide basic services, with reduced income, no investment nor borrowing capacity, increasing energy prices and the commitment to carry-out SEAP actions. Its purpose was to identify actions or measures that could generate enough income (e.g. Renewable Energy Resources (RES) production) or enough financial savings (e.g. energy efficiency) to finance the energy saving investments within a reasonable payback period, i.e. sustainable energy actions or measures in the Province of Barcelona at no cost or debt to the municipalities.

A technical assistance unit (REDIBA TA) was set-up to provide technical support and legal advice to municipalities related to the public tendering of energy savings investments in order to achieve their commitment of CO₂ emission reduction by means of public-private cooperation (ESCO, i.e. EPC and ESC, renting). In the REDIBA programme the REDIBA TA acts as project marketer, project facilitator, financial advisor and assessor.

It really started in May 2010 after having secured an ELENA (European Local Energy Assistance) grant of 2,0M€, seeking to reach 50M € investments by the end of the programme in June 2014.

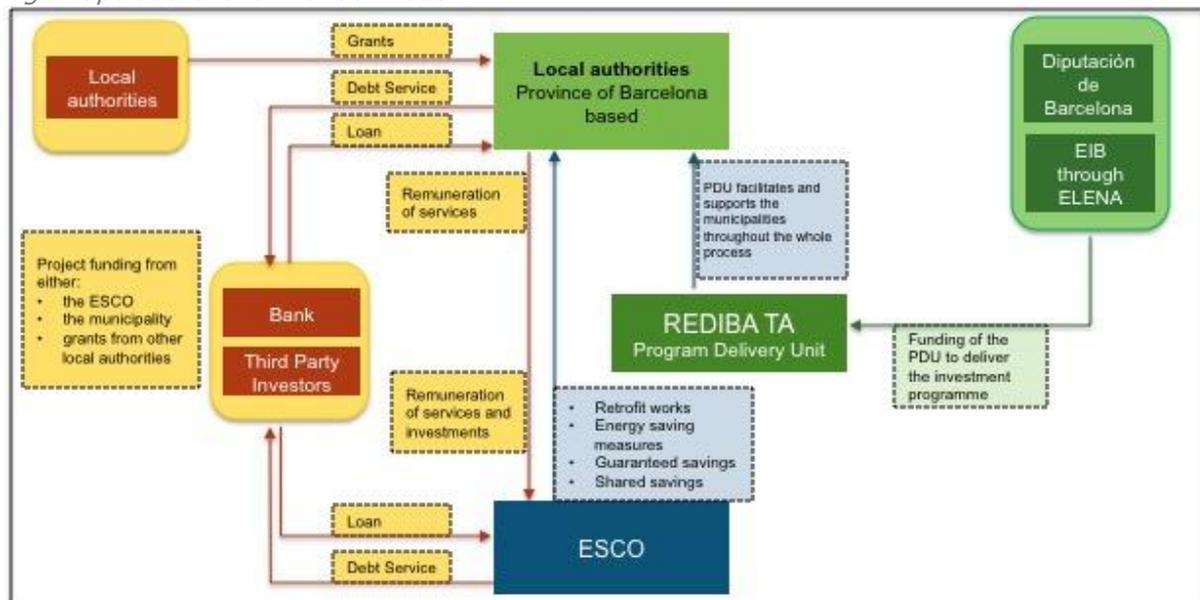
It first focused on solar photovoltaic, but had to reinvent itself after a year due to the abolishment of the feed-in tariff scheme for RES in Spain. It realigned its efforts towards energy efficiency and biomass for heating.

At the end of the programme REDIBA got investment applications from 183 out of the 311 municipalities. It supported 108 implemented projects representing around 96M€ of investment and a CO₂ reduction of 21,6K tonnes per year.

How does it work?

- Municipalities seeking to invest in reduction of energy consumption through ESCO Third Party financing can apply for technical and facilitation support from REDIBA TA. Based on a specific questionnaire REDIBA TA performs a technical assistance analysis allowing it to distinguish between viable or non-viable projects. The ELENA grant leverage requirement of x25 (1€ grant must result in 25€ investment) induces to be very strict in the selection and evaluation of projects to whom support will be given.
- If a project gets support based on the questionnaire the Mayor of the municipality needs to sign an engagement letter clearly committing to implement the project and invest the necessary amount if the technical and financial feasibility study determines that the project is viable.
- From this moment on the project becomes executable and the facilitation of the project by REDIBA TA starts up to the tendering of the project. Each municipality launches its tenders with the assistance of REDIBA TA.
- Depending of the type of EPC or ESC contract the chosen ESCO carries out the retrofit works or installs the energy efficiency measures, delivers the service and has carried out the measurement and verification by an external party during the agreed contract or payback period
- REDIBA in its role as financial advisor assists municipalities and ESCOs to agree on how the investments will be paid back to the ESCO. Funding of the investments are partially made in a traditional way through bank loans taken up either by the ESCO (almost all of the projects) or by the Municipality, and partially by the ESCO's own funds. In some cases the municipality received grants or loans from other local authorities or Government Energy Agencies.
- REDIBA TA is offering its services to the municipalities for free as a result of the 2,0M € ELENA funding and the 0,6M € funding from Diputación de Barcelona.

Fig 1. Operational and financial model



The program delivery unit

REDIBA TA is the program delivery unit of the Renewables and Energy Efficiency programme of the Barcelona Provincial Council (REDIBA). The programme is being managed by the Local Energy Management Support Division of the Barcelona Provincial Council.

The unit operates as programme marketer, applications assessor, project facilitator and financial advisor.

Its core activities include:

- Development of transverse instruments such as technical models for PV installation, ESCO models for public lighting and biomass heat generation or cogeneration, renting models for EE or RES and EPC models, market studies, energy efficiency measures studies, evaluations of actions and measures of SEAPs drafted by the Provincial council.
- Facilitation, including technical (feasibility studies) and legal advice (call for tender templates) to the municipalities and project management of the implementation of the EE and RES projects.
- Financial advice and assistance in the search of financing, contacts with financial institutions and investment funds
- Communication, capacity building and networking

To assure the working of the delivery unit funds of a total amount of 2,6M € have been made available for the period 2010-2014. Of this total funding amount 2,0M € has been provided by ELENA (European Local Energy Assistance run by the EIB) and 0,6M € by the Barcelona Provincial Council.

From 2010 to 2014 an amount of 2,08M € has been spent on external advice and studies. Approximately 586K€ was the cost of the direct staff members.

Legal structure	None
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Moderate
Program operational costs	Moderate

Organization and partnerships

Barcelona Provincial Council : program owner and political initiator, drives the programme delivery unit and supports part of the operating costs of the delivery unit.

REDIBA Technical Assistance Unit: developed the staff, procedures, tools and services for the program. Offer the program delivery unit services: marketer, project facilitation, projects aggregation, financial advice.

European Local Energy Assistance (ELENA): is part of the European Investment Bank's broader effort to support the EU's climate and energy policy objectives. This joint EIB-European Commission initiative helps local and regional authorities to prepare energy efficiency or renewable energy projects.

Beneficiaries

Beneficiaries	Municipalities of the Province of Barcelona
Type of projects	Public Lighting Solar Thermal Energy District Heating Biomass Energy Efficiency (building retrofits)
Operational support	Projects facilitation through the project delivery unit
Financial support	Projects facilitation costs free of charge

Funding mechanism

Program delivery unit funding	REDIBA TA has been funded by ELENA (2,0M €) and the Barcelona Provincial Council (0,6M €)
Projects Funding	Projects are mostly being funded by the ESCOs and sometimes by the municipalities' own funds
Funding Vehicle	ESCOs Municipalities (own funds)
Fund size	Not applicable
Fund type	Not applicable
Fund sources	
Financial Instruments	EPC Financing ESC Financing Rents/leasing Grants

Achievements

Today REDIBA has achieved the following:

- 108 projects executed
- 96 M € achieved capital investment
- 52,2 GWh/year energy savings
- 21,6K tonnes CO2 saved/year
- 312 applications from 183 municipalities (out of 311)

Some results in details:

Municipality	Project Type	Financial instrument	Investment M€	Energy savings Kwh	Duration
Santa María de Palautordera	Solar Thermal Energy	Own Funding			
Sabadell	Public lighting	EPC/ESCO + ICAEN	5,4	30%	10
Tona	Public lighting	EPC/ESCO + ICAEN	1	52%	13
Polinyà	Public lighting	EPC/ESCO	0,1	48%	10,5

martorelles	Public lighting	EPC/ESCO	0,6	49%	8
Cànoves i Samalús	Public lighting	Renting	0,7		10
Premià de Dalt	Public lighting	Own Funding + ICAEN Grant	0,4		
Corbera Llobregat	Public lighting	EPC/ESCO	2,8		
Santa Susanna	Public lighting	EPC/ESCO	1,9	53%	10,5
Tordera	Public lighting				
Sant Just Desvern	Public lighting				
Sentmenat	Public lighting				
Dosrius	Public lighting		1,4	73%	8
Montornès del Vallès	Public lighting				
Sallent	Public lighting				
Alella	Public lighting				
Vilassar de Mar	Public lighting				12
Granollers	Public lighting			60%	
Igualada	Public lighting				
Premia de Dalt	Public lighting	Own Funding	0,3		
VIC (Trinitarios buildign complex)	District Heating biomass	EPC/ESCO	0,5		10
Sant Salvador de Guardiola	District Heating biomass	EPC/ESCO	0,37		13
Caldes de Montbui	District Heating biomass	Leasing	0,4		7
Les Masies de Roda	District Heating biomass	Own Funding	0,07		4
Folgueroles	District Heating biomass	Own Funding +Xarxa Barcelona support	0,16		
Sta Maria de Corcó	District Heating biomass	Own Funding +Xarxa Barcelona support	0,29		
Montmajor	District Heating biomass	Own Funding +Xarxa Barcelona support	0,1		
Navas	District Heating biomass	Own Funding +Xarxa Barcelona support	0,2		
Villafranca del penedes	District Heating biomass	Own Funding +Xarxa Barcelona support	0,1		
Sant Adrià del Besòs.	EE Buildings	ESC			
Sabadell	EE Buildings	ESC			
Sentmenat	EE Buildings	EPC			

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Factsheet

General Info

Country	Spain
Model Name	Renewables and Energy Efficiency Diputación de Barcelona - REDIBA
Date of creation	2010

Model Description

Onwership	Public
Program authority	Barcelona Provincial Council
Program delivery unit	REDIBA Technical Assistance Unit
Operating services	Marketeer Assessor Facilitator Financial Advisor
Implementation model	Energy Performance Contracting (EPC, ESC,)
Types of projects financed	Public Lighting Solar Thermal Energy District Heating Biomass Energy Efficiency (building retrofits)
Beneficiaries	Municipalities within the province of Barcelona Other local authorities within the province of Barcelona
Geographical coverage	Regional (5,6 million inhabitants)

Financial Mode Description

Project funding	Public
Project funding vehicle	ESCOs Property Owners (Municipalities)
Financial instruments	EPC Financing ESC Financing Renting/Leasing Grants
Repayment model	Shared Service Agreement Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Unknown
Financial risk	ESCOs Property Owners

Model Requirements

Staff Requirements	Moderate Less than 10 FTE
Equity Requirements	No equity required
Funding Requirements	Moderate Less than 5 million €

Model Key indicators

Investment volume since creation	96 millions €
Size of project (or project portfolio)	
Level of average energy savings	

Development maturity

Development/implementation stage	Mature
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Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth of potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Low

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Model 2

Berlin Energy Saving Partnerships

City of Berlin – Germany

OWNERSHIP	PUBLIC/PRIVATE
Program authority	Federal state of Berlin, Senate Department for Urban Development and the Environment
Program Delivery unit	Berlin Energy Agency (BEA)
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketer Facilitator Financial advisor Aggregator
Projects Financed	Energy Efficiency (building retrofits)
Ambition/targets	Market based 26 projects with investment amount of 53M€ with an average of 26% energy savings.
Beneficiaries	Local authorities (95%) Health Care Sector (5%)
Funding Vehicle	Financial institutions ESCOs Property Owners
Financial Instruments	Equity/own funds EPC Financing Loans Grants

Summary

The Federal state of Berlin in partnership with Berlin Energy Agency (BEA) has initiated in 1996 the “Energy Savings Partnerships” for improving energy efficiency in public buildings in Berlin. They project manage the retrofit of public and private buildings, preparing tenders for works that will guarantee reductions in energy consumptions of an average of 26% based on Energy Performance Contracting (EPC) with the private ESCO sector (Energy Services Companies). In this program, BEA acts as project marketer, aggregator and facilitator, as well as financial advisor for the beneficiaries of the program (federal and local authorities).

So far 1.400 buildings have been upgraded or retrofitted, delivering CO₂ reductions of more than 70,000 tonnes per year.

As the programme is based on EPC with guaranteed savings and as the majority of these energy retrofits investment are being reimbursed to the ESCO from the majority of the energy savings there is no additional cost for the property owner.

The retrofit comes at no additional cost to the property owner as the idea is that the majority of the guaranteed energy savings is being used to the reimbursement of the investment to the ESCO, and that a small portion of the energy savings is being kept by the property owners as immediate savings on their energy bills.

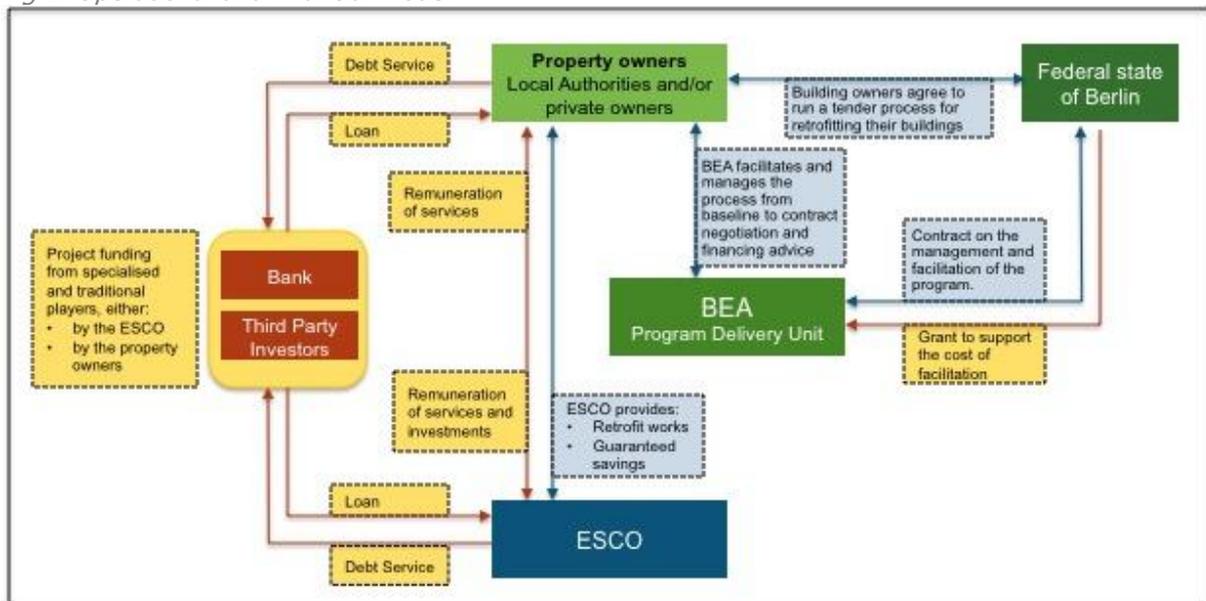
How does it work?

- The Federal state of Berlin, through the Senate Department for Urban Development and the Environment, initiates the Energy Saving Partnerships between building owners – typically various Berlin district administrations – and the ESCOs. The property owners agree to

establish an EPC-tender process for retrofitting their building to cut back on energy consumption.

- BEA then acts as the independent project manager, facilitating and managing the process from baseline to contract negotiation. BEA plays also the role of projects aggregator, bringing together a number of buildings, from 4 to as many as 150. These pools then issue EPC-tenders.
- The selected ESCOs install the guaranteed energy efficiency measures and pay for this retrofit upfront. The property owners reimburse the investments done by the ESCO over an agreed period – usually 8 to 12 years- in annual instalments from the energy savings. Typically around 80% of the annual savings are paid to the ESCO. Once the contract has come to term, the property owner benefits from the full energy savings.
- As financial advisor, BEA assists both the property owners and the ESCOs to decide on the reimbursement terms of the investments supported by the ESCO. Funding of the investments is made in a classical way through bank loans taken either by the ESCO or by the property owner.
- BEA is able to offer its services to the property owners with a considerable discount (50%) as a result of the joint 50/50 funding (grant) from the Senate.

Fig 1. Operational and financial model



The program delivery unit

BEA (Berlin Energy Agency) is the program delivery unit under assignment of the Federal State of Berlin and acts as marketer, projects facilitator, projects aggregator and financial advisor for the beneficiaries (property owners).

BEA is a public/private partnership between the government of the federal state of Berlin, the governmental development bank KfW Bankengruppe and private stakeholders.

BEA operates as an energy services company in Germany and internationally. In Germany and abroad, BEA prepares energy concepts, provides project management and advice on the implementation of innovative energy service models in buildings (e.g. Energy Savings Partnerships in more than 1,400 public buildings in Berlin) and promotes the use of renewable energies. It also assists in the implementation of modern energy management. Furthermore, its scope of business includes awareness raising and information campaigns targeting end users, decision makers and multipliers.

Legal structure	GmbH Gesellschaft mit beschränkter Haftung (Limited Liability Company)
Shareholder description	Public-Private Partnership

Equity	2,56M €
Shareholders	Federal State of Berlin (25%) - Public Vattenfall Europe Wärme AG (25%) – Private GASAG Berliner Gaswerke AG (25%) - Private KfW Bankengruppe (25%) - Public
Program dedicated staff	Moderate – 5 FTE
Program operational costs	Moderate Less than 10M €

Organization and partnerships

Federal State of Berlin through the Senate Department for Urban Development and the Environment: takes political decisions, initiates the program, assigns the program delivery unit, supports the cost of the program delivery unit via grants.

Berlin Energy Agency (BEA): developed the staff, procedures, tools and services for the program. It offers program delivery unit services such as programme marketing, project facilitation, projects aggregation, and financial advice.

Local partner banks: contribute to the program funding through loans.

Beneficiaries

Beneficiaries	Local authorities Health care sector SME's & Businesses
Type of projects	Energy Efficiency (building retrofits)
Operational support	Projects facilitation through the program delivery unit
Financial support	Projects facilitation costs free of charge

Funding mechanism

Program delivery unit funding	BEA is being funded by the shareholders. The program delivery unit operational costs are funded by grants from the State and District Municipals Government
Projects Funding	Projects are being funded by loans taken either by the ESCOs or the Property owner. In some cases, the Property owner is funding projects on equity/own funds.
Funding Vehicle	ESCO's Property owners (own funds)
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	EPC Financing Loans Grants

Achievements

So far, 26 projects have been realised by end of 2013 covering 1.400 buildings with a global investment of 53,0M €. The projects have led to total guaranteed savings of around EUR 11,9M € or 26% of the energy bills.

Some results in detail:

Property Owner	Investment (Mio EUR)	Baseline (Mio EUR/year)	Savings	Funding	Contract duration (years)
Berliner Bäder Betriebe	7,9	4,9	33,5%	ESCO	10
Berliner Immobilienmanagement	2,4	2,07	21,0%	ESCO	10

Bezirk(district) Steglitz Zehlendorf	2,8	1,84	29,4%	ESCO	14
Deutsche Oper Berlin	1,48	0,65	35,8%	ESCO	12
JVA Tegel	2,5	1,8	33,0%	ESCO	12
Pankow Berlin (lighting)		0,88	10,2%	ESCO	2
Pankow Berlin district	1,77		24,2%	ESCO	
University of Arts	1,1	0,86	27,7%	ESCO	10
Wenckeback Hospital Berlin	2,44	0,8	39,6%	ESCO	12

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Factsheet

General Info

Country	Germany
Model Name	Energy Savings Partnerships
Date of creation	1996

Model Description

Ownership	Public-Private
Program authority	Federal state of Berlin, Senate Department for Urban Development and the Environment
Program delivery unit	Berlin Energy Agency (BEA)
Operating services	Marketer Facilitator Financial Advisor Aggregator
Implementation model	Energy Performance Contracting (EPC)
Types of projects	Energy Efficiency (Buildings retrofit)
Beneficiaries	Federal and local authorities (95%) Health Care Sector (5%)
Geographical coverage	Regional City of Berlin (3,4 million inhabitants)

Financial Mode Description

Project funding	Public-private
Project funding vehicle	Financial institutions ESCOs Property Owners
Financial instruments	Equity/own funds EPC Financing Loans Grants
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Property Owners
Financial risk	ESCOs

	Property Owners
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Model Requirements

Staff Requirements	Moderate 5 FTE
Equity Requirements	No equity required
Funding Requirements	Moderate Less than 10M€

Model Key indicators

Investment volume since creation	53M €
Size of project (or project portfolio)	1.400 buildings retrofitted with project size between 4 to 150 buildings per project.
Level of average energy savings	26% in average

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Growth

Model Qualification

Level of establishment	Well established
Growth of potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Moderate

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Model 3

London's Building Retrofit Programme - RE:FIT

Greater London – United Kingdom

OWNERSHIP	PUBLIC
Program authority	Greater London Authority
Program Delivery unit	RE:FIT Programme Delivery Unit (PDU)
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketer Facilitator Aggregator Financial advisor Assessor
Projects Financed	Energy Efficiency (building retrofits)
Ambition/targets	By 2025: Reach 40% of public sector buildings, reach 11 million m ² , reach 400 Million £ investment Intermediary target by 2015: Retrofit up to 600 buildings, reach 1,6 million m ² and savings of 45,000 tonnes Co ₂
Beneficiaries	London based public sector organisations
Funding Vehicle	ESCOs Financial institutions Investment Funds Property owners
Financial Instruments	EPC Financing Loans Grants

Summary

RE:FIT, or the retrofitting of London's public sector buildings, is one of the pillars of the Mayor of London's strategic approach to climate mitigation in London. It is a programme designed to help public sector and charitable organisations achieve substantial financial savings, improve the energy performance of their buildings and reduce their CO₂ footprint based on the principle of Energy Performance Contracting (EPC).

The programme's ambition is to reach, by 2025, 40% of the public buildings, this would correspond to some 11 million m² and would represent an investment amount of 400M £. Its intermediary targets for 2015 are to retrofit 600 buildings corresponding to 1,6 million m² and representing CO₂ emission reductions of 45K tonnes.

The first RE:FIT framework to deliver the programme was created in 2010, building on experiences with pilot BEEP (Building Energy Efficiency Programme) which was in place from 2009 to 2010. It streamlines the procurement process for energy services by providing pre-negotiated, EU-regulation-compliant contracts that can be used with a group of pre-qualified Energy Service Companies (ESCOs) for the design and implementation of energy conservation measures.

The second RE:FIT framework, OJEU (Official Journal of the European Union) procured by the London Authority, started in September 2011 for a period of 48 months. The 2nd RE:FIT framework, is operated by RE:FIT Programme Delivery Unit (PDU). PDU basically manages the RE:FIT framework of suppliers, facilitates the uptake by London's public sector organisations and supports the beneficiaries through all project stages.

In the summer of 2013 the GLA launched a specific RE:FIT School programme targeted to address energy efficiency in schools. The programme is supported by Salix, an independent, publicly funded

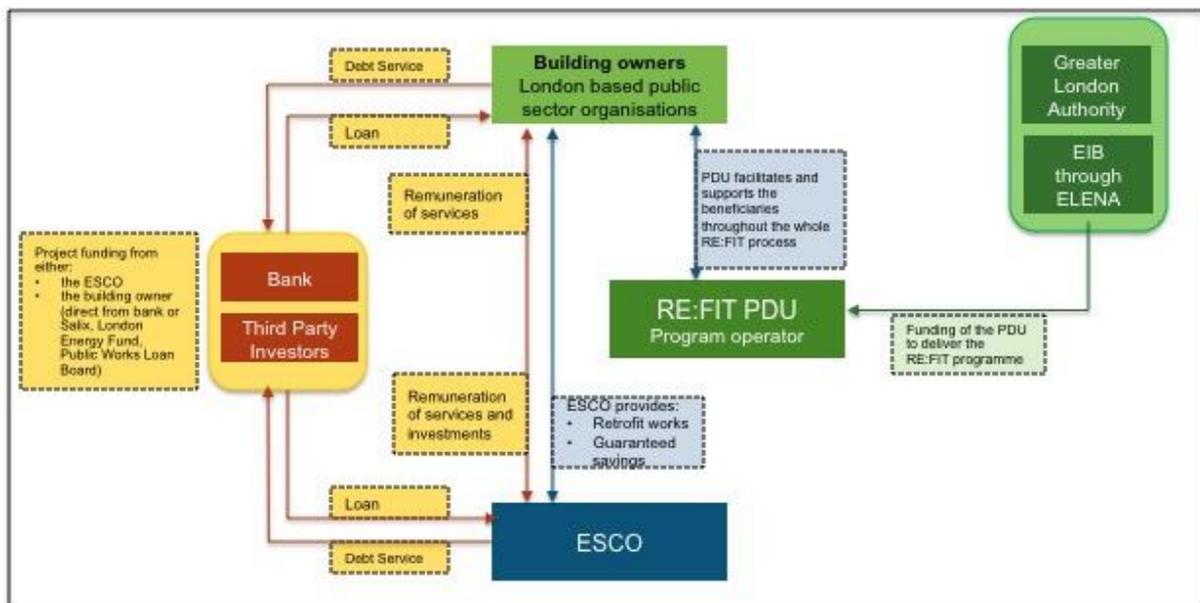
company, dedicated to providing the public sector with loans for energy efficiency projects. Salix provides interest free loans to participating schools up to 100% of the project value.

So far the PDU has been able to engage 199 public sector organisations in the programme, representing a total investment value of 68,6M £. About 460 buildings have been retrofitted or are in the process of being retrofitted.

How does it work?

- Public sector organisations interested in retrofitting their buildings based on the principle of EPC will first need to sign a Memorandum of Understanding to the RE:FIT programme. It indicates interest and commitment at senior level.
- This allows the PDU to develop a full retrofit project and support the organisation through the whole RE:FIT process in its role as facilitator and financial advisor.
- The following steps need to be considered:
 - Identification of the buildings to be retrofitted
 - Setting of target energy savings and the payback period
 - Decision on funding approach
 - Completion of project brief
- From this moment on an ESCO must be chosen.
- Under standard procurement rules a sometimes lengthy and cumbersome tender process needs to be initiated by the public sector building owner. The RE:FIT framework has simplified this procurement process by providing pre-negotiated, EU-regulation-compliant contracts that can be used with a group of 12 pre-qualified ESCOs. Here the building owner only needs to run a mini competition to select an Energy Service Company (ESCO) to carry out the works and guaranteed energy saving measures.
- The chosen ESCO installs the energy conservation measures, delivers the service and carries out measurement and verification during the agreed contract or payback period.
- Typical energy conservation measures include:
 - Equipment: Variable Speed Drive (VSD) on pumps and fans, heat recovery, insulation to pipe work, radiator reflector panels, PC control (automatic overnight computer shutdown), voltage optimisation, Building Management System (BMS) controls
 - Lighting retrofit, relighting and controls
 - Building envelope: draught proofing, cavity wall insulation, loft insulation, secondary glazing,
 - Energy production: district heating, photovoltaic panels, solar thermal, combined Heat & Power (CHP)
- Funding of the projects can include the following: own funding by the building owner, borrowing directly from banks or from public financial institutions and funds such as Public Works Loan Board, Salix or London Energy Efficiency Fund, or can be financed through a third party (E.g. ESCO). The PDU, as financial advisor, can advise organisations on the types of funding available and how these are accessible.
- PDU was provided to the RE:FIT users at no cost as a result of the 2,4M £ ELENA funding and the almost 0,3M £ funding from Greater London Authority. Recently GLA has changed that policy and as from October 2015 full support will be given to organisations for a contribution of 2,500£ (excl VAT).

Fig 1. Operational and financial model



The program delivery unit

RE:FIT PDU is the program delivery vehicle of the energy retrofitting programme RE:FIT in London. It acts as the permanent energy efficiency management office of the programme under supervision of the Greater London Authority.

The role of the PDU is to manage the RE:FIT framework, to support RE:FIT users throughout the entire RE:FIT process (from management buy-in to service delivery and performance monitoring), to drive and facilitate the uptake by London based public sector organisations and to develop best practice approaches, templates and standards. It acts as projects facilitator, marketer, aggregator and financial advisor.

The RE:FIT PDU has about 10 staff and is being run by Turner & Townsend under the supervision of the GLA programme director. Turner & Townsend, supported by PA Consulting Group, was appointed in September 2011 to run the RE:FIT PDU on behalf of the GLA for a 3 year period.

Since 2011 the PDU operations have been secured by a 2,67M £ funding. Of this funding amount some 90% or 2,4M £ have been provided by ELENA (European Local Energy Assistance run by the EIB) and some 10% or 0,27M £ by the Greater London Authority.

RE:FIT PDU aims to leverage its operating costs 25-36 times in delivered capital investment or minimum of 66Mio £ by 2015, but with aim of 96 Mio £

As the current RE:FIT framework will come to an end in the course of 2015 the GLA is working on putting a new RE:FIT framework in place. The necessary 2,5M £ to 3,0M £ funding for the next phase is still to be secured. It is expected that the bulk of funding will come from the GLA and from charges applied to organisations seeking support from the RE:FIT PDU.

Legal structure	N/A
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Moderate – 10 FTE
Program operational costs	Moderate

Organization and partnerships

Greater London Authority (GLA): programme owner and political initiator. Supports part of the operating costs of the programme delivery unit.

RE:FIT PDU: is the permanent energy efficiency programme management office. It provides staff, procedures, tools and services for the program. It offers program delivery unit services such as marketing and engagement, project facilitation; aggregation and financial advice. Turner & Townsend, supported by PA Consulting Group, have been appointed to run the RE:FIT PDU on behalf of the Greater London Authority for a 3 year period.

- **Turner & Townsend:** professional services provider to businesses that invest in, own and operate assets in the public and private sectors.
- **PA Consulting Group:** is a consulting, technology and innovation firm

Public Financial institutions and Funds:

- **Salix:** delivers 100% interest-free capital to the public sector to improve their energy efficiency and reduce their carbon emissions. Salix was established in 2004 as an independent, publicly funded company, dedicated to providing the public sector with loans for energy efficiency projects
- **LEEF (Londen Energy Efficiency Fund):** invests in energy efficiency retrofit to public, private and voluntary sector buildings and infrastructure in order to make it more energy efficient and environmentally friendly. LEEF is one of three 'Urban Development Funds' (UDFs) procured by the European Investment Bank (EIB) on behalf of the London Green Fund
- **PWLB (Public Works Loan Board):** is a statutory body operating within the United Kingdom Debt Management Office, an Executive Agency of HM Treasury. PWLB's function is to lend money from the National Loans Fund to local authorities, and to collect the repayments.

International institutions:

- **European Local Energy Assistance (ELENA):** is part of the European Investment Bank's broader effort to support the EU's climate and energy policy objectives. This joint EIB-European Commission initiative helps local and regional authorities to prepare energy efficiency or renewable energy projects

ESCOs: 12 pre-qualified Energy Services Companies

Beneficiaries

Beneficiaries	London based public sector organisation and charities
Type of projects	Energy Efficiency (building retrofits)
Operational support	Project facilitation through the Project Delivery Unit
Financial support	Project facilitation costs free of charge until September 2015

Funding mechanism

Program delivery unit funding	RE:FIT has been funded by ELENA (2,4M £) and the Greater London Authority (0,27M £)
Projects Funding	Projects are being funded by the building owners and in some cases by the ESCO.
Funding Vehicle	Public ESCO Property owners
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Unknown
Financial Instruments	EPC Financing Loans Grants Own funds

Achievements

To date the RE:FIT programme has achieved the following:

- 199 organisations engaged (Summer 2015) (31 of 33 London Burroughs, 25 NHS (National Health Service, UK's healthcare system) organisations and 143 other organisations (central government, museums and education)
- 440 buildings retrofitted or in the process of being retrofitted
- 68,6 Mio £ achieved capital investment (Summer 2015)
- 5Mio £ per annum of energy savings
- 34,5K tonnes CO₂ saved/year

Investment amounts range from less than 0,1M £ to over 6,0M £ and energy savings range from 7% to 47% with the bulk of energy savings between 15% and 30%.

The RE:FIT programme has won a number of awards in the fields of government and sustainability.

Local Partnerships, a joint venture between HM Treasury and GLA, working with the Department of Energy and Climate Change (DECC), is building on the success of the London RE:FIT scheme to support public sector organisations outside London implement RE:FIT across their buildings portfolio.

Some details:

RE:FIT users	Buildings	Investment t M£	Energy Savings	CO2 reduction (tonnes)	Payback period
Pilot	42 buildings	7,00	28,0%	7.000	7
Enfield	council buildings	1,70	21,0%	1.700	7
Ealing	3 health facilities	1,04	29,0%	1.000	5
Newham	University hospital	0,40	9,8%	732	5
Kew	Royal Botanic Gardens	0,70	7,0%	760	6
Harrow	8 public sector buildings	1,00	38,0%	685	9,5
Goldsmiths	University of London	6,00	47,0%	3.000	12
Waltham Forrest	NHS	0,10	9,5%	139	5,5
Colville	Primary school	0,07	29,0%	50	7
Waverly	School	0,24	25,0%	163	8
London	LSE	2,30	18,0%	8.574	7
DECC	2 Grade II listed buildings	0,60	14,6%	159	12
Camden	19 buildings	1,40	28,0%	978	5
Croydon	18 buildings	1,70	15,0%	1.300	8,5
Tower Hamlets	TH College	0,90	26,0%	440	15
Newham	University Hospital	0,44	9,8%		5
West London Alliance	11 buildings	0,73	28,0%	595	7
Brent	15 council buildings	0,94	25,0%	645	8,5
Sutton	10 council buildings	1,07	20,0%	846	7
Olympic Delivery Authority	12 primary and secondary schools	0,55	35,0%	701	4
		28,88		29.467	

Contact details

RE:FIT

Visit: www.REFIT.org.uk

E-mail: REFIT@london.gov.uk

020 7759 8515

Factsheet

General Info

Country	United Kingdom
Model Name	RE:FIT London's Building Retrofit Programme
Date of creation	2009

Model Description

Ownership	Public
Program authority	Greater London Authority
Program delivery unit	RE:FIT Programme Delivery Unit (PDU)
Operating services	Marketer Facilitator Aggregator Financial Advisor Assessor
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency (Buildings retrofit)
Beneficiaries	London based public sector organisations and charities
Geographical coverage	Regional 8,63 Million inhabitants

Financial Model Description

Project funding	Public
Project funding vehicle	Property owners ESCOs
Financial instruments	EPC Financing Loans Grants Own funds
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	n/a
Financial risk	Building owners ESCO

Model Requirements

Staff Requirements	Moderate to high 10 FTE
Equity Requirements	n/a
Funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	68,6M £
Size of project (or project portfolio)	0,1M £ to +6,0M £
Level of average energy savings	20% - 30%

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
------------------------	------------------

Growth potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	High – Most of the funding is own funding

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Model 4

Regional Energy Services Company Vlaams Energiebedrijf - VEB

Belgium

OWNERSHIP	PUBLIC
Program authority	Vlaamse Overheid (Flemish Region)
Program Delivery unit	Vlaams Energiebedrijf NV
Implementation Model	Central Purchasing of Energy (Energy Supply Contracting) Energy Performance Contracting (EPC)
Operating Services	Marketer Facilitator Aggregator Assessor
Projects Financed	Energy Efficiency (buildings) Other (infrastructure)
Ambition/targets	Energy Efficiency: Targeting 1200 public buildings and organisation in Flanders and achieving 25% energy savings
Beneficiaries	Public organisations in Flanders
Funding Vehicle	ESCOs Property Owners Financial institutions
Financial Instruments	EPC Financing Equity/Own funds Loans

Summary

The "Vlaams Energiebedrijf NV" (VEB), a Flemish External Independent Agency under the form of a Publicly owned Limited Company, was incorporated by the Flemish Government in 2012. VEB's existence and incorporation has been highly driven by the political situation in Belgium since 2009 (e.g. transfer of federal competences to the regions) and is the result of certain Flemish political parties' desire to create a Flemish alternative to the existing incumbent energy company in Belgium.

VEB's purpose from the beginning was to facilitate, deliver and coordinate energy services to realise energy efficiencies in public buildings, to facilitate or be a player in the electricity (green and/or decentralised production) and gas market (cogenerating) or the electricity and gas delivery market and to facilitate or be a player in the market of Green Certificates and Cogeneration Certificates.

Since the incorporation the scope of its ambition and activities has been changing and today the VEB's focus is on being a Central Purchasing body for energy, on facilitation of Energy Efficiency investments of the Flemish public institutions both central as local.

As a central purchasing body it targets 30% share of the Flemish public institutes and has the ambition to generate, after 3 years, 40M€ yearly energy savings with these targeted Flemish authorities.

As to its energy efficiency programme the VEB is targeting 1200 Flemish public buildings with a current energy baseline of 100M €. The VEB aims at achieving 25% energy savings from energy efficiency measures, or €25M of yearly savings.

VEB went really operational in the course of 2014 and today it counts about 60 customers for group purchasing of energy (about 8% of the market) and it reached for the 1st quarter of 2015 annualised savings of 12M € (9,8M € energy and 2,2M € admin/billing expenses), or 20% savings on the energy bill.

Recently VEB managed to successfully complete the tender of a building energy efficiency project (Energy and Maintenance Performance Contracting (EMPC model) and was in the process of tendering 2 other projects.

How does it work?

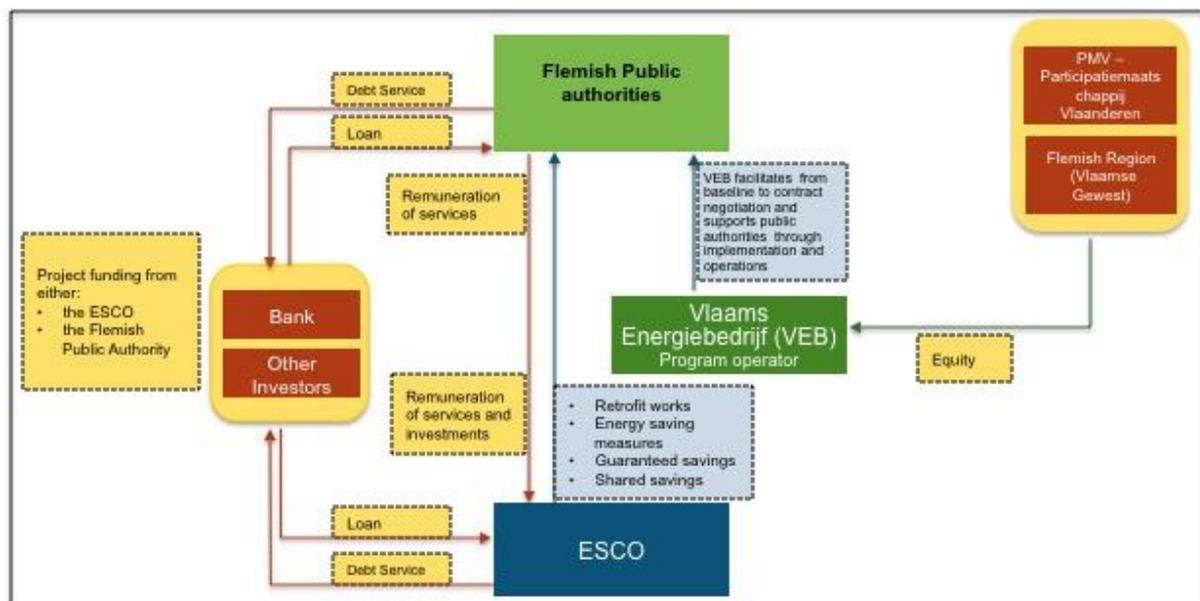
Energy Supply programme

- Flemish public sector organisations interested in decreasing their energy bill can adhere to VEB as Central Purchasing Body for the Flemish authorities without having to go through a public tendering process.
- The VEB becomes the energy supplier of the Flemish public organisation once the existing energy delivery contracts have been transferred to the VEB. It will buy or produce energy and will charge it at cost to its public customers.

Energy efficiency programme

- Flemish public sector organisations interested in achieving energy savings through Energy and Maintenance Performance Contracting (EMPC) can apply for the services of the VEB.
- The VEB, in its role as facilitator, will then support the organisation through the whole process from baseline definition and analysis up to the tendering of the project and contract negotiation. The VEB can also support the organisation during the implementation phase and operations.
- Through the application of standardised quotes and contracts the VEB guarantees its customers shortened lead times.
- The chosen ESCO installs the energy efficiency measures or, if applicable, carries out the retrofit works and delivers the service. During an agreed period of time, often around 10 years, the building owner or public organisation uses part or all of the energy savings to remunerate the ESCO for its services and the upfront investment. After the contract period the public organisation has the full benefit of the energy savings.
- Funding of the investments under this model is being secured in a rather classical way through own funding or by borrowing (e.g. loans) taken either by the ESCO or by the public authority.
- VEB is offering its services to the Flemish authorities and other authorities in Flanders at cost as it is not the intention to generate profits at the legal entity level.

Fig 1. Operational and financial model for Energy Efficiencies in buildings



The program delivery unit

VEB is the program delivery unit of the Flemish Region's energy savings and rational energy consumption programme. It is a Flemish External Independent Agency under the form of a Publicly owned Limited Company participated by the PMV – *Participatiemaatschappij Vlaanderen* (a Flemish investment company owned by the Flemish Region).

Currently the unit operates mainly as a Central Purchasing Body for energy (electricity and gas) for the Flemish authorities though it is also licensed to deliver to other regional authorities. VEB buys energy (100% green electricity and gas) in the short term market (spot market) and sells it to the Flemish government and public institutions. This includes sourcing, administrative tasks such as billing and customer contact.

On energy efficiency projects the unit acts in the first place as programme marketer and facilitator.

It has mainly 2 objectives:

- Make Flemish Region buildings more energy efficient through facilitation of energy efficiency projects by inventorying the energy consumption in Flemish public buildings and by enabling the rational use of energy through EPC contracting and pooling of buildings
- Deliver (cheaper) energy to the Flemish authorities through group purchasing (Central Purchase Body model)

VEB got an initial paid-in equity of 50M€.

Currently VEB has 16 staff of whom the vast majority is dedicated to operating the central purchasing of energy function. Yearly operating costs for energy efficiency are currently rather low as VEB is in its early stage of facilitation of energy efficiency in public buildings. It recently managed to successfully tender its first EPC/ESCO project for its customer OPZC Rekem (Psychiatric centre).

Legal structure	<i>Extern verzelfstandigd agentschap in de vorm van een Naamloze Vennootschap (Flemish External Independent Agency under the form of a Publicly owned Limited Company)</i>
Shareholder description	Public
Equity	50M €
Shareholders	PMV - <i>Participatiemaatschappij Vlaanderen</i>
Program dedicated staff	High – 16 FTE, but only a few dedicated to EE
Program operational	Moderate

costs	
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Organization and partnerships

Vlaamse Gewest (Flemish Region) : program owner and political initiator, control of VEB through PMV (Flemish Region is sole shareholder of PMV)

Participatiemaatschappij Vlaanderen (PMV): Is an investment company and majority shareholder of VEB since May 2015. Has taken over the role of investor of the VEB since 2015.

Vlaams Energiebedrijf (VEB): developed the staff, procedures, tools and services for the program. Offers the program delivery unit services: marketing and promotion, project facilitation, aggregation and energy services provision.

Beneficiaries

Beneficiaries	Flemish authorities Local authorities
Type of projects	Energy Efficiency in buildings Other (infrastructure)
Operational support	Projects facilitation through the project delivery unit
Financial support	Projects facilitation costs charged at cost

Funding mechanism

Program delivery unit funding	VEB has been funded by the shareholders (Flemish Region) and has currently 50M € equity
Projects Funding	Projects are mostly being funded by the beneficiaries own funds or possibly by the ESCOs.
Funding Vehicle	ESCOs Property Owners Financial Institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	EPC Financing Equity/Own funds Loans

Achievements

VEB shows the following results as of May 2015:

- Energy supply:
 - March 2015: delivery volume of 800GWh (385 GWh electricity and 415 GWh gas) to 57 customers (CPB-model) or 8% of total market.
 - May 2015: savings of € 12M in 2015 (9,8M € energy and 2,2M € admin/billing expenses), or 20% savings on energy bill
- Energy efficiency:
 - VEB has one building energy efficiency project with OPZC Rekem (Psychiatric centre) successfully tendered based on the EMPC model. Currently it is in the process of tendering 2 other projects (*De Vlaamse Opera* (Flemish Opera) and *BLOSO Gent* (Regional Sports administration of Flemish authorities)).

Contact details

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Factsheet

General Info

Country	Belgium
Model Name	Regional Energy Services Company Vlaams Energiebedrijf –VEB (Flemish Energy Company)
Date of creation	2012

Model Description

Onwership	Public
Program authority	Flemish Region
Program delivery unit	VEB - Vlaams Energiebedrijf
Operating services	Marketer Facilitator Aggregator Assessor
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency in buildings
Beneficiaries	Flemish authorities (regional) Other local authorities within Flemish Region
Geographical coverage	Regional (6,4 M inhabitants)

Financial Mode Description

Project funding	Public
Project funding vehicle	ESCOs Property owners Financial institutions
Financial instruments	EPC Financing Equity/Own funding Loans
Repayment model	Shared Service Agreement Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Unknown
Financial risk	ESCOs Property Owners

Model Requirements

Staff Requirements	Moderate Less than 10 FTE dedicated to Energy Efficiency
Equity or funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	Unknown
Size of project (or project portfolio)	Unknown
Level of average energy savings	Unknown

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Low

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	High
Replicability of the model	Moderate
Impact on public balance sheet	High

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Model 5

Regional Energy Services Operator - OSER

Rhône-Alpes region – France

OWNERSHIP	PUBLIC
Program authority	Region of Rhône-Alpes - France
Program Delivery unit	<i>Société Publique Locale Efficacité Energétique Opérateur de Services Energétiques Régional</i> (SPL OSER) - Public Regional Energy Services Operator
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketer Facilitator Integrator Financial advisor Financier
Projects Financed	Energy Efficiency (building retrofits)
Ambition/targets	Factor 4 20 projects with investment amount of 78M€ over 3-4 years Reach French energy consumption standard (BCC) of 80kWh/m ² /year Energy savings from 40% to 75%
Beneficiaries	Shareholders (Regional Public authorities)
Funding Vehicle	Public ESCO Financial institutions
Financial Instruments	EPC Financing Loans Grants

Summary

"SPL OSER" (*Société Publique Locale Efficacité Energétique Opérateur de Services Energétiques Régional*), a Publicly owned Local Limited Company (PLLC), was created at the end of 2012 to assist local and regional authorities in the region of Rhône-Alpes in meeting the challenges of energy transition through the realisation of deep energy retrofit projects. OSER stands for "Regional Energy Services Operator" and its mayor role is to act as a Public ESCO (Energy Services Company) for its public shareholders within the Rhône-Alpes region. Its founding partners, the Region of Rhône-Alpes, 9 municipalities and the inter-municipality SIEL, created the SPL as an answer to the then very weak demand for deep energy retrofit investments and the quasi-absence of comprehensive retrofit solutions offering. They were convinced that energy efficiency requirements on new construction only would not suffice to decrease the ambitious CO₂ emission reduction targets and that the public authorities had to play a leadership role in the roll-out of deep energy retrofit projects, in order to boost a dynamic of energy retrofit.

The programme's ambition is to invest around 78M€ and reach for every retrofitted building the French Low Energy Consumption standard BBC (*Batiment Basse Consommation*) of 80kWh/m²/year, achieve significant cuts in energy consumption ranging from 40% to 75%, boost the regional economy and create jobs through retrofitting.

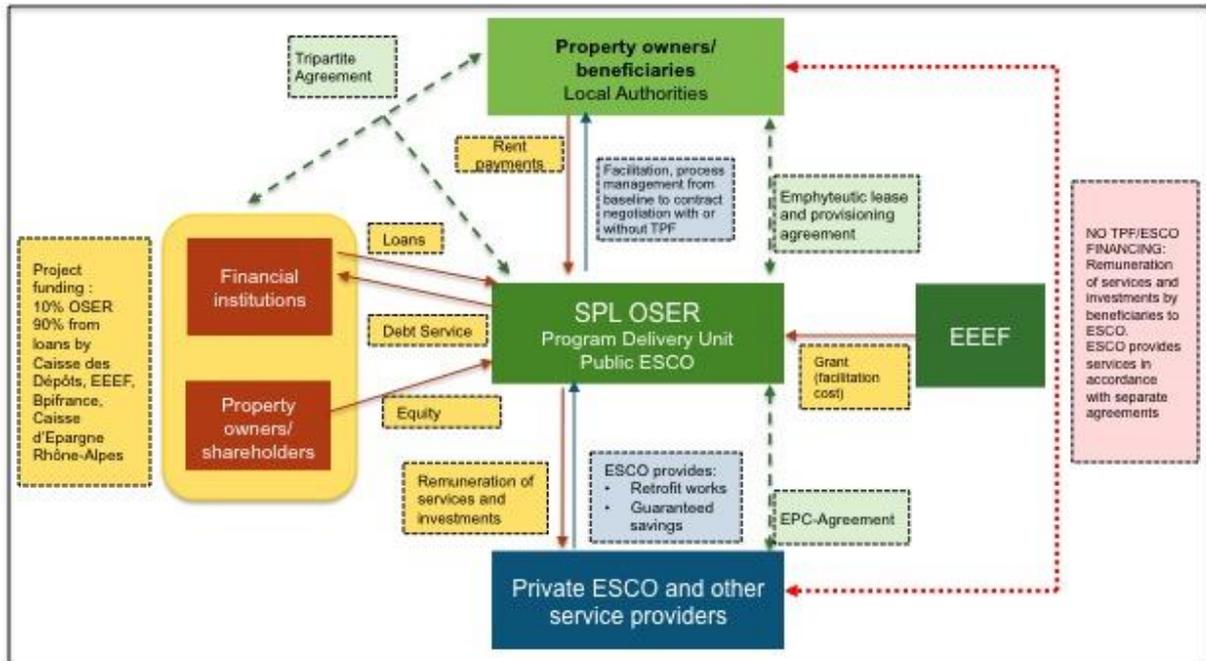
The SPL went operational at the end of 2014 with the signature of the first project with Ville de Bourg-en-Bresse related to the retrofit of the school buildings of 3 school groups. Currently it has launched 10 projects with a total investment value of 31M€ and it has 7 other projects in feasibility phase.

How does it work?

- Municipalities, local and regional authorities wanting to apply for the services of SPL OSER in order to perform feasibility studies, or to execute or implement their retrofit or renovation

- programme need first to become shareholder of the SPL, provided that they adhere to the by-laws and to the shareholders charter. Their contribution to the equity is 1€ per inhabitant.
- The beneficiaries can basically choose between two approaches to carry out their retrofit energy programme or investments:
 - Based on a separate contractor approach.
OSER can then provide project development assistance (feasibility studies, preliminary assessment, public procurement, financial advice), and if requested, project management of the necessary energy retrofit to be carried out. It basically assists the beneficiaries in preparing and follow-up of the contracts as part of the retrofit programme.
 - Based on an EPC-approach (Energy Performance Contracting) including 3rd party finance provided by OSER.
In this case OSER provides project development assistance, project management and financing and commits to guaranteed energy savings.
OSER's services, as public ESCO, are considered to be "in-house" thus no public tender needs to be carried out by the beneficiary. OSER applies the competitive dialogue tender to those services that it outsources, in other words services that it does not perform itself. Beneficiaries that have chosen for the EPC-approach will have to contribute around 10% of the total investment amount to the equity of OSER, thus increasing their participation in the SPL OSER. OSER is providing the financing of the other 90%.
As counterpart of the services the beneficiary pays a fixed rent amount to OSER over an agreed period in accordance with the signed Emphyteutic Lease and Service Delivery Agreement. The duration of the agreement is at least 18 years. The property reverts to the beneficiary at the end of the Emphyteutic lease period.
 - Funding of the investments under an EPC-approach is being secured through equity of OSER (about 10%) and 90% of the funding is being secured with regional, national and European financial institutions:
 - 41M € long term loans on savings funds "Livret A" from Caisse des Dépôts, i.e., soft loans for projects in priority areas for urban policy (urban renovation loans and urban project loans) as well as "Green Growth Loans" with a term of +/- 20 years
 - 5M € short term funding from EEEF, the European Energy Efficiency Fund (senior construction facility for energy efficiency schools retrofit)
 - Possible Bpifrance funding (Bpifrance is a subsidiary of Caisse des Dépôts)
 - Possible European Investment Bank (EIB) funding via Caisse d'Épargne Rhône-Alpes

Fig 1. Operational and financial model



The program delivery unit

SPL OSER is the program delivery vehicle of the energy retrofit investments of its local public shareholders in the Region of Rhône-Alpes. It acts as marketer, facilitator, integrator, financial advisor and financier for the beneficiaries, though the service delivery perimeter is by law limited to its (public) shareholders within the territory of Rhône-Alpes.

It actually operates partly as a provider of services and expertise, and also as a third party investor in energy efficiency projects for local and regional public buildings, thus having all characteristics of a public ESCO.

It has basically three objectives:

- Carry out energy retrofit or renovation of public buildings while providing a comprehensive offer, such as EPC, to the beneficiaries. This includes design, implementation, operation and procuring third party financing for the projects.
- Provide legal and technical engineering assistance, but also financial advice to develop or acquire financing by third-party investors.
- Mutualise the acquired competencies, skills and resources and capitalise on experiences.

Projects need to be presented to OSER's "Investment Committee" (15 members) and are formally approved by the board of Director (which takes decisions).

Currently OSER has 6 staff and its operations have been considerably secured with a 1,1M € technical assistance grant from EEEF.

Legal structure	SPL-Société Publique Locale (Publicly owned Local Limited Company)
Shareholder description	Public Partnership
Equity	7.405.660€
Shareholders	Region Rhône-Alpes (88%) 11 participating municipalities (11,3%) SIEL-intermunicipality (0,7%)
Program dedicated staff	Moderate – 6 FTE
Program operational costs	Moderate Less than 10M €

Organization and partnerships

Region of Rhône-Alpes: main political initiator and majority shareholder of SPL OSER (88%),
SPL OSER: provides staff, procedures, tools and services for the program. Offers the program delivery unit services: marketer, project facilitation, projects integration, financial advice and 3rd party financier.

Local partner banks: Caisse des Dépôts, Bpifrance

European Energy Efficiency Fund (EEEF): Is an innovative public-private partnership dedicated to mitigating climate change through energy efficiency measures and the use of renewable energy in the member states of the European Union. It focuses on financing energy efficiency, small-scale renewable energy, and clean urban transport projects (at market rates) targeting municipal, local and regional authorities and public and private entities acting on behalf of those authorities.

European Investment Bank (EIB) through Caisse d'Épargne Rhône-Alpes: The EIB is the European Union's bank, owned by and representing the interests of the European Union Member States. It works closely with other EU institutions to implement EU policy. EIB provides finance and expertise for sound and sustainable investment projects which contribute to furthering EU policy objectives.

Beneficiaries

Beneficiaries	Local and regional authorities
Type of projects	Energy Efficiency (building retrofits)
Operational support	Project facilitation and 3 rd party financing through the Project Delivery Unit
Financial support	Project facilitation costs free of charge under EPC-approach

Funding mechanism

Program delivery unit funding	SPL OSER is being funded by the shareholders (public authorities). The program delivery unit's operational costs are basically funded by a 1,1M€ grant from EEEF
Projects Funding	EPC Projects are being funded by equity of the SPL (10%) and the remaining 90% through loans taken by the ESCO. Separate based contracting projects are funded by the Property Owners.
Funding Vehicle	Public ESCO Public Building owners (own funds)
Fund size	Not applicable
Fund type	Not applicable
Fund sources	
Financial Instruments	EPC Financing Loans Grants

Achievements

Currently 10 projects are being implemented for 4 Shareholder-Beneficiaries with a global investment amount of 31M €. Investment amounts range from 0,9M€ to over 6,0M€ and energy savings range from 40% to 70%. Furthermore, SPL OSER has 7 projects in feasibility or preliminary assessment phase.

Since the foundation of SPL OSER by the 11 initial public authorities 2 local authorities have joined as shareholders and 2 other local authorities are in the process of joining.

Some details on the on-going projects:

Beneficiary-Shareholder	Buildings	Investment Mio €	Baseline K€	Energy Savings	Funding

Ville de Bourg en Bresse	Schools Baudin, Robin, Vennes	6,2	106,0	50-60%	SPL OSER
Rhône-Alpes Region	5 regional high schools	18,0	368,4	41%	SPL OSER
Cran Grevier	Town hall	5,9	47,0	70%	SPL OSER
Montmélian	Multimedia library	0,9	7,0		SPL OSER
		31,0	528,4		

Contact details

SPL OSER

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www.spl-oser.fr

Factsheet

General Info

Country	France
Model Name	Regional Energy Services Company - OSER
Date of creation	2012

Model Description

Ownership	Public
Program authority	Region of Rhône-Alpes
Program delivery unit	SPL OSER
Operating services	Marketer Facilitator Integrator Financial Advisor Financier
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency (Buildings retrofit)
Beneficiaries	Shareholders-Local authorities
Geographical coverage	Regional 6,3M inhabitants

Financial Model Description

Project funding	Public
Project funding vehicle	Public ESCO Shareholders
Financial instruments	EPC Financing Loans Grants
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Pledged receivables
Financial risk	Public ESCO Property Owners

Model Requirements

Staff Requirements	Moderate Less than 10 FTE
Equity Requirements	Low Yearly budget of +/-500K€, 1,1M € granted by EEEF
Funding Requirements	Moderate

	Less than 5M €
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Model Key indicators

Investment volume since creation	31M €
Size of project (or project portfolio)	0,9M € to +6,0M €
Level of average energy savings	40% - 70%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Well established
Growth potential	Large
Scalability of the model	Low
Replicability of the model	High
Impact on public balance sheet	High

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Model 6

Belgian Federal Energy Services Company - Fedesco

Belgium

OWNERSHIP	PUBLIC
Program authority	Belgian Federal State
Program Delivery unit	Fedesco
Implementation Model	Separate Contractor based (SCB) Energy Performance Contracting (EPC)
Operating Services	Marketing Aggregation Facilitation Integration Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Ambition/targets	Market based Energy retrofit of federal public buildings with an objective of 22% CO2 savings
Beneficiaries	Federal public administrations Other federal public organisations Regional, provincial and local authorities (through the Knowledgecenter)
Funding Vehicle	Property Owners (Federal state)
Financial Instruments	Equity/Own funds

Summary

Fedesco was created in 2005 as a public ESCO to study and implement energy efficiency projects in 1.800 Belgian federal public buildings, of which about 2/3 is owned by the Belgian federal state and 1/3 is being rented from private building owners. The company started with a capital of 1,5 million €, later extended to 6,5 million €. At its creation, Fedesco had a financing capacity as third party investor of 5 million €, quickly increased to 10 million € and (in 2009) to 100 million €. As from 2007, Fedesco was given an exclusive right to work for the federal administrations. A strong collaboration was initiated with the federal Building Agency that acts as building owner and manager.

As from 2007 Fedesco first implemented a "separate contractor" based model, implementing so-called "transversal measures" with a strong focus on HVAC (mainly boiler replacement and boiler room renovation), HVAC regulation, relamping and relighting, co-generation and roof insulation. Fedesco thus acted as an "integrator" to become one of the first public ESCOs in Europe. Additionally, Fedesco launched a campaign for behaviour change targeting building occupants. In 2008, the government gave Fedesco a secondary mission to install PV solar panels on roofs of certain buildings and to negotiate concessions with private installers of PV solar panels on other buildings, for a budget of 1,5 million €.

From 2005 to 2014, Fedesco invested 27,4 million € using the separate contractor based model, including 2 million € in studies and engineering.

From 2011, Fedesco started implementing an alternative parallel model, using EPC contracting, using an innovative methodology called smartEPC, co-developed with a private facilitator (Energinvest). SmartEPC is effectively a model for Maintenance, Energy and Comfort Performance Contracting. The difference between smartEPC and more traditional EPC, is the fact that the contract also includes a full maintenance of all the technical installations in the building and that this maintenance is performance-based. It uses the Dutch standard for "condition scoring", called NEN2767. SmartEPC

also uses a performance based methodology for measuring the “comfort” in the building, as perceived by the occupants, that uses comfort surveys of those occupants. Finally, smartEPC uses a whole array of tools and a streamlined process to manage the “facilitation” of the project. A first pilot project was initiated, for 13 federal public buildings that are rented from a private real estate company, for an investment of 1,4 million €. In 2014, a second project was initiated in 9 other federal public buildings. For these smartEPC projects, Fedesco acts as facilitator, with the Building Agency as public tendering body.

In 2011, Fedesco created a “Knowledgecenter” department to provide EPC facilitation services to non-federal public authorities, i.e. regions, provinces, cities and municipalities. Fedesco tendered for several consecutive framework contracts to be assisted by a private EPC facilitator. Several EPC projects were initiated (e.g. Province of Walloon Brabant, GRE Liège...).

In 2015, Fedesco was integrated into the Building Agency.
How does it work?

Separate contractor based model (transversal measures)

- Federal public administrations seeking to reduce their energy consumption contract with Fedesco for an initial quick scan of their buildings
- Fedesco subcontracts the realization of the quickscan to a private auditor with whom it has concluded a framework contract
- The resulting measures are discussed and budgeted and a contract is drafted between Fedesco and the customer
- Fedesco outsources the detailed study and technical specifications to private engineering companies. Results are discussed with the Building Agency.
- After approval Fedesco organizes a tender to private installers and contractors for the implementation of the works and coordinates the planning and implementation. On site works are coordinated by the Building Agency.
- Fedesco pre-finances the works, out of annual federal public budgets, and customers reimburse Fedesco, either directly or spread over several years.
- Fedesco has invested in energy monitoring and bookkeeping and tracks the performance of the energy efficiency measures.

EPC Contracting

- Fedesco identifies opportunities for EPC projects with federal administrations and initiates the project based on requirements (energy saving, maintenance contract)
- Fedesco subcontracts facilitation activities to a private facilitator/consultant that accompanies Fedesco and the federal Building Agency.
- Savings potential is (optionally) being pre-evaluated through quick scans and detailed technical inventories of buildings are being realized. These technical inventories include condition scores of all technical elements in the building according to the Dutch NEN2767 standard for performance-based maintenance. More info (in Dutch) on NEN2767 can be found at [https://nl.wikipedia.org/wiki/Conditiemeting_\(gebouw\)](https://nl.wikipedia.org/wiki/Conditiemeting_(gebouw)) and <https://www.nen.nl/NEN-Shop/Conditiemeting/Introductie-NEN-2767.htm>. An English description can be found at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.502.8574&rep=rep1&type=pdf>
- Fedesco, assisted by the private facilitator, has developed standard smartEPC tendering documents
- The Building Agency tenders for EPC projects assisted by Fedesco and the private facilitator.
- M&V services are delivered by Fedesco and the private facilitator to the Building Agency

Fig 1. Operational and financial model – Separate Contractor based model

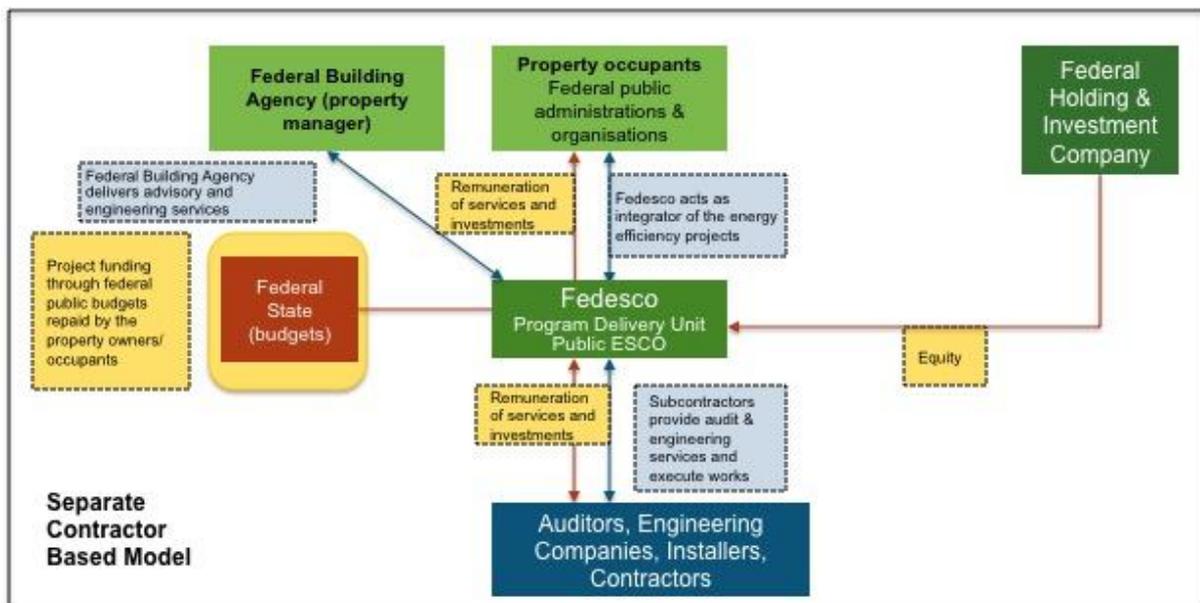


Fig 2. Operational and financial model – EPC based model



The program delivery unit

Fedesco is the program delivery unit of the Belgian Government.

The unit operates as programme marketer, project integrator (in case of the separate contractor based model), project facilitator (in case of EPC), financial advisor, financier and assessor.

Its core activities include:

- Identification of buildings
- Identification of energy savings potential
- Outsourcing to and integration of auditors, engineering companies, installers and contractors
- EPC project facilitation
- Financial advice and financing (through federal public budgets)
- Communication, capacity building and networking

Although originally planned, through the use of the 100 million € financing capacity with state guarantee, Fedesco never acted as third party investor to provide loans to its customers. Financing comes from federal public budgets and there is no debt deconsolidation. This means that the financing does not meet the ESR-neutrality criteria for being qualified as being “off-balance”. In other words, the loans are being considered as public debt. The main reason is that the financing is provided by the public authority itself, as Fedesco is 100% owned by the government, through its shareholder, the Federal Holding and Investment company, which is also 100% owned by the federal state.

Fedesco employs a staff of 11 people, including 3 project managers.

Legal structure	Public Limited Liability Company by public law
Shareholder description	Public company
Equity	6,5 million
Shareholders	Federal Holding and Investment Company (100% state owned)
Program dedicated staff	High
Program operational costs	Moderate

Organization and partnerships

Federal Building Agency: the federal Building Agency assists Fedesco in the separate contractor based model through engineering advices, approved projects for implementation and provides staff for on-site works coordination and acceptance.

Beneficiaries

Beneficiaries	Federal public administrations (ministries) Other federal public organisations
Type of projects	Energy Efficiency (building retrofits)
Operational support	Projects facilitation through the project delivery unit
Financial support	Projects facilitation costs free of charge

Funding mechanism

Program delivery unit funding	Fedesco has been funded by the Federal Holding and Investment Company (6,5 M€)
Projects Funding	Projects are funded out of the Federal governments own budgets, through a budget distribution mechanism. 1,5 M€ of Fedesco’s equity was used for separate PV solar panel projects.
Funding Vehicle	Property Owners (Federal state)
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity/Own funds

Achievements

In the period 2005-2013 Fedesco achieved the following investments

- Engineering: 2.000.000 euro
 - • 450 energy audits
 - • 23 CHP technical specifications
 - • 75 Relighting Specs
 - • 70 Insulation Specs
 - • 150 HVAC Specs
- Works: 20.500.000 euro
 - • 6 CHP projects
 - • 45 relighting projects

- • 32 insulation projects
- • 43 HVAC projects (boiler replacement)
- • 8 solar panels projects (4000 m²)
- • 35 HVAC optimisation projects
- • 600 complete energy monitored buildings

Fedesco and the federal Building Agency have initiated 2 EPC projects in federal public buildings.

Through its Knowledgecenter, Fedesco has initiated 4 EPC projects

Contact details

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Factsheet

General Info

Country	Belgium
Model Name	Fedesco
Date of creation	2005

Model Description

Ownership	Public
Program authority	Belgian Federal State
Program delivery unit	Fedesco
Operating services	Marketing Aggregation Facilitation Financial advice Financing Assessment
Implementation model	Separate Contractor based Energy Performance Contracting (EPC)
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Beneficiaries	Federal public administrations Other federal public organisations Regional, provincial and local authorities (through the Knowledgecenter)
Geographical coverage	National (federal) Regional/Provincial/Local (through the Knowledgecenter)

Financial Mode Description

Project funding	Public
Project funding vehicle	Property Owners (Federal state)
Financial instruments	Equity/Own funds
Repayment model	N/A

Project risk Profile

Performance risk	Property owners (Separate contractor based) ESCOs (EPC)
Recourse	Not applicable
Financial risk	Property owners

Model Requirements

Staff Requirements	High More than 10 FTE
Equity or funding requirements	Moderate Less than 10 million €

Model Key indicators

Investment volume since creation	27,4 millions €
Size of project (or project portfolio)	10.000 € – 500.000 € (separate contractor based) 1,4 million € - 7 millions € (Energy Performance Contracting)
Level of average energy savings	15% – 35%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	Moderate
Replicability of the model	Moderate
Impact on public balance sheet	High

Sources

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Model 7 Eandis EDLB

Belgium

OWNERSHIP	PUBLIC
Program authority	Eandis
Program Delivery unit	Eandis EDLB (Energiediensten aan Lokale Besturen)
Implementation Model	Separate Contractor based (SCB)
Operating Services	Marketing Integration Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Ambition/targets	Market based
Beneficiaries	Cities, municipalities, Provinces
Funding Vehicle	Utility funds Financial institutions Property owners
Financial Instruments	Equity/Own funds Loans Grants Utility incentives

Summary

Eandis is the electricity and gas distribution company for a significant part of the Flanders region. In fact it is an operating company created by 7 local distribution companies, owned by municipalities, that are shareholders of Eandis.

In the past, under Flemish policy directives, Eandis (as well as another distribution company, called Infrac) had a public general service obligation to assist its shareholders (municipalities, cities, provinces) with energy conservation measures (e.g free energy bookkeeping, free energy audits, etc.).

In 2010, this role was extended with a "public ESCO" role, consisting of accompanying cities, municipalities, and provinces in studying, implementing and financing energy saving investments in their public buildings. The driver is very often the engagement of these local authorities under the Covenant of Mayors.

Eandis, through its EDLB (Energiediensten voor Lokale Besturen or Energy Services for Local Authorities) service offering, plays the role of an integrator, subcontracting energy audits, engineering and technical specifications and works to the private sector through a "separate contractor based model". Projects typically include boiler replacements, roof insulation, window replacement, relamping and relighting, HVAC regulation and PV solar panels.

How does it work?

Eandis implements a 6 steps approach:

- Implementation of an energy bookkeeping solution, baseline measurement and identification of energy savings potential
- Realization of an energy audit, followed by a project advice. This is the basis for a first decision of the customer to engage with Eandis.

- Design phase, including technical specifications and detailed engineering state, followed by the project execution. Eandis subcontracts these steps, through framework agreements, to private engineering companies and contractors
- Financial engineering
- Communication and behaviour campaigns to occupants
- Follow-up (M&V) and monitoring

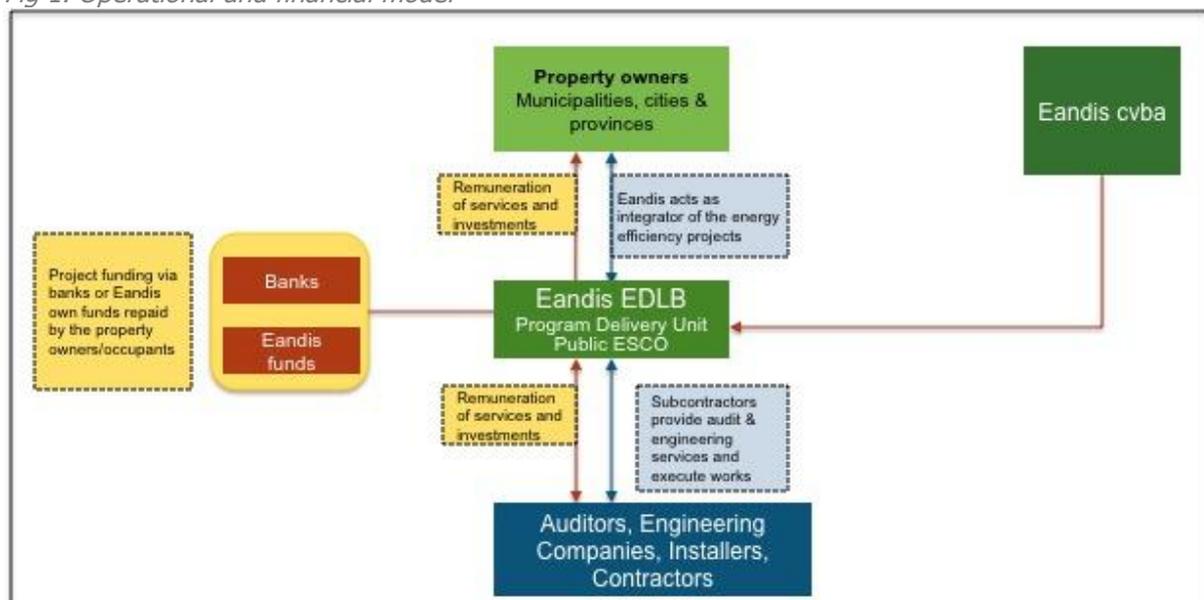
In case of renovation of boiler rooms that run on fuel, Eandis also subsidises the transformation to gas (free network study, free connection, subsidy for fuel tank clean-up, free pre-design and 2 years of free maintenance).

In 2015, Eandis launched a first pilot project using the EPC-methodology, on behalf of the City of Ghent, but this methodology is not yet operational. The main reasons for starting to use EPC are the fact that the separate contractor based method is difficult to implement and the fact that the market is looking for EPC-based solutions as other facilitators and ESCO's have started to offer them.

Eandis EDLB also offers projects for public street lighting through a "master plan public lighting". This includes

- Analysis of the current situation
- Definition of goals
- Definition of measures to achieve the goals (relighting quick scan)
- Calculation of the impact
- Design and implementation of an action plan

Fig 1. Operational and financial model



The program delivery unit

Eandis EDLB, which is not a separate legal entity but an internal department, is the program delivery unit of Eandis' programme and service offering to local public authorities.

The unit operates as programme marketer, project integrator, financial advisor, financier and assessor.

Its core activities include:

- Accompaniment of Sustainable Energy Action Plans (SEAP) under the Covenant of Mayors programme
- Assessment of energy consumption to standardized (free) energy bookkeeping
- Identification of energy savings potential, through (free) audits
- Engineering (outsourced to specialized engineering companies)

- Implementation of investment works (outsourced to specialized contractors)
- Financial advice and financing
- Implementation of behaviour campaigns
- Communication, capacity building and networking

In 2011, Eandis had as part of its public ESCO role, 507 contracts with 110 municipalities, for a turn over of 22.575.103 euro (incl. VAT). By 2012 this increased to 220 municipalities, 415 energy saving investment projects and 242 study contracts in preparation of future investments for a total amount of 46.481.710 euro (planned and executed). In 2015, Eandis reported a total of 95 M€ of engaged projects.

In 2011, Eandis EDLB employs a staff of about 25 people.

Legal structure	CVBA (Cooperative Company with Limited Liability)
Shareholder description	Public company
Equity	N/A
Shareholders	Gaselwest, IMEA, Imewo, Intergem, Iveka, Iverlek, Sibelgas
Program dedicated staff	High
Program operational costs	High

Organization and partnerships

Eandis does not use any particular partners in its ESCO offering.

Beneficiaries

Beneficiaries	Municipalities, Cities and Provinces
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Operational support	Projects integration through the project delivery unit
Financial support	Free energy bookkeeping, measurement campaigns (incl. IR scans) and audits

Funding mechanism

Program delivery unit funding	Unknown
Projects Funding	Projects are funded by Eandis or through bank loans
Funding Vehicle	Utility funds Financial institutions Property owners
Fund size	Unknown
Fund type	Unknown
Fund sources	Unknown
Financial Instruments	Equity/Own funds Loans Grants Utility incentives

Achievements

In 2015, Eandis reported 95 M€ of engaged energy saving projects. There is no data available on global energy savings but projects typically reach 15 to 40%. Payback times typically range from 2 to 15 years.

Contact details

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Fact sheet

General Info

Country	Belgium
Model Name	Eandis EDLB
Date of creation	2010

Model Description

Ownership	Public
Program authority	Eandis
Program delivery unit	Eandis EDLB
Operating services	Marketing Integration Financial advice Financing Assessment
Implementation model	Separate Contractor based
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Beneficiaries	Municipalities, Cities and Provinces
Geographical coverage	Regional/Provincial/Local

Financial Mode Description

Project funding	Public
Project funding vehicle	Utility funds Financial institutions Property owners
Financial instruments	Equity/Own funds Loans Grants Utility incentives
Repayment model	N/A

Project risk Profile

Performance risk	Property owners
Recourse	Not applicable
Financial risk	Property owners

Model Requirements

Staff Requirements	High More than 10 FTE
Equity or funding requirements	Unknown

Model Key indicators

Investment volume since creation	90 M€
Size of project (or project portfolio)	Unknown
Level of average energy savings	15% – 40%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth

Financial development maturity	Growth
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Model Qualification

Level of establishment	Well established
Growth of potential	Large
Scalability of the model	Low
Replicability of the model	Moderate
Impact on public balance sheet	High

Sources

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Bram Van Eeckhout, Eandis, Klantreacties op een EPC-aanbod bij lokale besturen, 31 May 2015

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Model 8

ESCOLIMBURG2020 (Infrac ESCO)

Province of Limburg – Belgium

OWNERSHIP	PUBLIC
Program authority	Province of Limburg/Infrac
Program Delivery unit	Infrac ESCO
Implementation Model	Separate Contractor based (SCB)
Operating Services	Marketing Integration Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Ambition/targets	Market based
Beneficiaries	Cities, municipalities, Provinces
Funding Vehicle	Utility funds Financial institutions Property Owners Investment funds
Financial Instruments	Equity/Own funds Loans Grants Utility incentives

Summary

ESCOLIMBURG2020 is a joint project of the Province of Limburg, Infrax (the provincial energy grid operator) and Dubolimborg, a provincial consultancy institute specialized in sustainable buildings. ESCO Limburg 2020 aims to accelerate the energy renovation of municipal properties in order to reach faster the Near Zero Energy (NZE) standard in the Province and to contribute to the achievement of the Province and 44 Municipalities' climate objectives.

Through the involvement of Infrax's existing public Energy Service Company (ESCO), created in 2010, a package of energy services to enhance the energy efficiency of buildings is offered to Limburg municipalities, which include free services (telemetry and monitoring, a feasibility study and an energy register for the properties) as well as a series of consulting services (including dynamic simulations and measurement campaigns), and eventually a fully implemented project. The ESCOLIMBURG2020 project aims to support, optimise and expand these ESCO activities. Proposed interventions can regard all aspects of energy consumption: heating, ventilation, air conditioning, lighting, renewable energy, insulation, and they are characterized by high ambitions (savings > 30%, average 40%). The ESCO identifies the most optimal solution for the building, taking into account payback periods, available budgets and the requirements and needs of the administration.

To help local authorities gain an insight into their energy consumption, ESCOLIMBURG2020 provides – via Dubolimborg and during the course of personal discussions with policy makers – a Sustainable Energy Action Plan (SEAP) for the various municipalities in Limburg. This report contains figures that are suitable for use for the follow-up measurement under the Covenant of Mayors. With the help of this follow-up measurement, the municipality can view, assess and verify CO2 emissions within its territory in relation to the impact of actions based on the municipal climate action plan.

The ESCO division of Infrax acts as the programme delivery unit for the ESCOLIMBURG2020 programme.

ESCOLIMBURG2020 is supported by the Intelligent Energy Europe programme through the MLEI-PDA assistance (Mobilizing Local Energy Investments). In 3 years the project is expected to mobilize EUR 19.8 million investments in sustainable energy.

Financing of energy renovation measures is a key aspect of the project. Municipalities can choose a pre-financing by the Infrax ESCO, in which the investment is repaid through savings in energy costs, or an own financing or bank loan via Infrax. ESCOLIMBURG2020 can also identify other possible financing options and techniques through a financial study, e.g. leasing, investment support, grants, or also the Limburg Climate Fund, which is supported by citizens and businesses. The Limburg Climate Fund (Limburgs Klimaatfonds) is a cooperative capital fund created on January 30, 2012 by the LRM investment fund, the Limburg climate company NUHMA and the cooperative company LIMCOOP, to invest in climate friendly projects. Both citizens, organisations and companies can buy shares, that are used to provide loans to project developers. The profits from the fund are redistributed to the fund's shareholders. The goal is to provide a return of 1% above the one of a classical savings account.

How does it work?

Together with the local government, Infrax examines how municipal or provincial buildings can be made more energy efficient. Infrax looks for an optimal solution and works from the perspective of profit maximisation for the client.

Infrax follows an integrated approach and looks at the building as a total concept. It proposes the most optimal solution, taking into account payback periods, available budgets and the requirements and needs of the administration and the people on the work floor.

Infrax uses its in-house knowledge in the field of engineering, law, administration, monitoring of savings, coordination of projects, etc. This knowledge, which has become a field of specialisation for Infrax, is not always available at the local level, often because of the time required for acquiring such knowledge. Infrax prepares all the necessary works in-house– from the fine-tuning of the existing heating systems to a thorough and total renovation of the building.

All aspects of energy consumption are examined: heating, ventilation, air conditioning, lighting, renewable energy and insulation. Infrac provides a total solution: information, advice, coordination, monitoring, implementation as well as financing.

In case of an ESCO pre-financing, the local government repays its investment in energy efficiency measures with what they save on energy costs.

Infrac uses framework contracts with specialized engineering companies and contractors in each of the relevant domains.

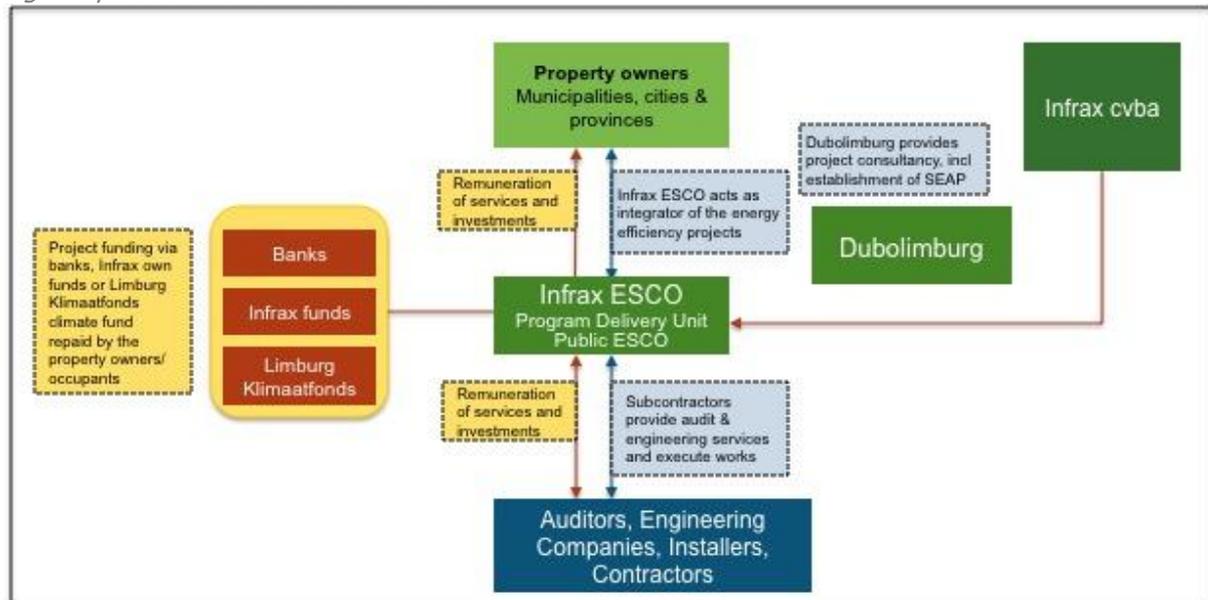
The goals of ESCOLIMBURG are in practical terms:

- € 19,837,230 in energy investments
- A minimum of 30% energy savings per building with an average of 40% of the total project
- The reduction of GHG emissions of 50,000 tons and at least 11,000 MWh / year of energy savings
- 44 local authorities receive a custom retrofitting & Sustainable Energy Action Plan (SEAP) for their heritage sites
- Analyze, improve, and unroll the public ESCO model throughout the province of Limburg

Infrac ESCO follows a 7-steps approach:

- **Feasibility study:** Based on a questionnaire and a visit to the building, a feasibility study is prepared, which includes an estimate of the costs and final savings. This feasibility study is conducted free of costs for the public administration.
- **Detailed study:** After approval by the municipal council, all the techniques contained in the feasibility study are discussed during a scope-setting meeting, so that any necessary adjustments can be made. Once the scope is approved, the engineering consultants start drafting the detailed study. For each technique, the necessary specifications, plans and lists of measurements are prepared. This phase is paid for by the municipality.
- **Call for tenders:** Tenders are invited on the basis of a list of qualified contractors. This also allows local contractors to send a price quotation. These contractors have been pre-selected and shortlisted, based on a technical tendering process, with technical, operational and financial criteria. Infrac has selected contractors for each of the techniques that are typically encountered in the projects.
- **Award:** After approval of the award report by the management committee of Infrac and the public administration, a kick-off meeting is held with all the parties involved.
- **Implementation:** The kick-off meeting decides on the start date and implementation period for the works. During the implementation phase, Infrac is also responsible for monitoring the work site.
- **Final acceptance:** Infrac is responsible for inspecting the implemented works, so that a provisional acceptance of the works can take place. Any problems that may be present are identified in cooperation with the implementing parties and resolved. The final acceptance takes place after one year, following inspection.
- **Financial settlement:** The municipality or the province pays for the investment based on its chosen financial option. The investment can be made from the municipal or provincial budget, a standard loan or through pre-financing via Infrac (loan for a maximum period of 20 years). Additionally, Infrac offers new financing options, which will emerge from the financial study.

Fig 1. Operational and financial model



The program delivery unit

Infrac ESCO (which is not a separate legal entity but an internal department), created in 2010, is the program delivery unit of the ESCOLIMBURG2020 programme.

The unit operates as programme marketer, project integrator, financial advisor, financier and assessor.

- Its core activities include:
- Establishment of the global ambition of the customer (through the SEAP), identification of the buildings, proposal of the ESCO contract
- (Free) feasibility studies to determine the energy savings potential
- Detailed studies
- Tendering for works, works supervision
- Pre-financing or arrangement of financing via banks
- Transfer of works and management of the repayment schedule
- Follow-up and monitoring

Infrac ESCO offers 4 types of financing options:

- Pre-financing by Infrac
- Own financing by the customer
- Bank loan
- Limburgs Klimaatfonds (climate fund)

In 2013, Infrac ESCO had realized the following investments:

- Number of feasibility studies: 217
- Amount for feasibility studies: 6.006.000 €
- Number of detailed studies: 76
- Amount for detailed studies: 400.000 €
- Works in progress: 4.417.659 €
- Works executed: 329.535 €
- TOTAL: 11.257.194
- Program goal: 19 M€

In 2014, it reported 2 M€ of executed projects, in 9 municipalities, for 345 MWh energy savings and avoiding 72 tons of CO₂.

By 2015 this has increased to 10 projects, 985 MWh saved and 207 tons of CO₂ avoided.

Infrax ESCO employs a staff of about 8 people.

Legal structure	CVBA (Cooperative Company with Limited Liability)
Shareholder description	Public company
Equity	N/A
Shareholders	Infrax Limburg, Iveg, Infrax West, PBE, Riobra
Program dedicated staff	Moderate
Program operational costs	Moderate

Organization and partnerships

Province of Limburg

The Province of Limburg, located in Belgium, has 835,505 inhabitants (as per the count on 1 January 2010) and 44 municipalities. The provincial administration has set itself the ambitious goal of becoming climate neutral. The municipalities are important partners for achieving this goal and hence the province, as the assisting authority, has been designated as the 'Covenant Coordinator' under the Covenant of Mayors in 2010.

Limburg was the first province in Europe to succeed in getting all its municipalities to sign the Covenant Of Mayors on 30 November 2011.

Dubolimburg

Since 2009, Dubolimburg has been providing objective and independent (tailor-made) advice on sustainable building and living to the construction sector, local authorities and private individuals. Dubolimburg, as a provincial support centre, initiates awareness-raising and information campaigns, based on the instructions of the Province of Limburg.

Dubolimburg assists cities and municipalities in preparing and implementing their own, tailor-made climate action plans, e.g. by helping them perform CO2 baseline measurements. Key actions are the empowerment of innovative demonstration projects and providing guidance and advice for specific urban projects and construction projects, both with respect to renovation as well as new construction. The services provided by Dubolimburg act as a powerful driving force for leading cities and municipalities to the ESCO service of Infrax.

Beneficiaries

Beneficiaries	Municipalities, Cities and Provinces
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Operational support	Projects integration through the project delivery unit
Financial support	Free energy bookkeeping, measurement campaigns (incl. Infrared Imagery scans of the building envelope) and audits

Funding mechanism

Program delivery unit funding	Unkown
Projects Funding	Projects are funded by Infrax, through own funds or through bank loans
Funding Vehicle	Utility funds Financial institutions Property Owners Investment funds
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity/Own funds

	Loans Grants Utility incentives
--	---------------------------------------

Achievements

In 2015, Infrac reported 2 M€ of realized energy saving investments, 985 MWh saved and 207 tons of CO2 avoided.

There is no data available on a global percentage of energy savings, but projects typically reach 15% to 40%. Payback times typically range from 2 to 15 years.

Contact details

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Fact sheet

General Info

Country	Belgium
Model Name	ESCOLIMBURG2020
Date of creation	2012

Model Description

Ownership	Public
Program authority	Province of Limburg/Infrac
Program delivery unit	Infrac ESCO
Operating services	Marketing Integration Financial advice Financing Assessment
Implementation model	Separate Contractor based
Type of projects	Energy Efficiency (building retrofits) Energy Efficiency (public lighting) Renewable energy
Beneficiaries	Municipalities, Cities and Provinces
Geographical coverage	Regional/Provincial/Local

Financial Mode Description

Project funding	Public
Project funding vehicle	Utility funds Financial institutions Property Owners Investment funds
Financial instruments	Equity/Own funds Loans Grants Utility incentives
Repayment model	N/A

Project risk Profile

Performance risk	Property owners
Recourse	Not applicable
Financial risk	Property owners

Model Requirements

Staff Requirements	Moderate Less than 10 FTE
Equity or funding requirements	Unknown

Model Key indicators

Investment volume since creation	2 M€
Size of project (or project portfolio)	Unknown
Level of average energy savings	15% – 40%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	Low
Replicability of the model	Moderate
Impact on public balance sheet	High

Sources

<http://www.infrax.be>

Coopenergy, Province of Limburg, BE - "ESCOLIMBURG2020"

ESCOLIMBURG2020 brochure, BUILDING A SUSTAINABLE FUTURE TOGETHER

Patrick Boucneau & Nele Vandenreyt, ESCOLimburg2020 & Limburg Climate Fund, Limburg CLIMATE NEUTRAL, Training & Networking Event NETCOM – Managenergy, 10 oktober 2013

Dirk Schreurs & Patrick Boucneau, Cooperation for refurbishment of municipal buildings in Limburg (B), Brussels, 08 October 2014 & 28 April 2015

Patrick Boucneau & Nele Vandenreyt, from SEAP to... real investments in municipal buildings

Public ESCO schemes: POSIT'IF (FR), ESCOLIMBURG (BE), ESCOSC (NL)

Model 9

Eco'Energies (CCI Nice Côte d'Azur)

France – Alpes-Maritimes & Var

OWNERSHIP	PUBLIC
Program authority	CCI Nice Côte d'Azur
Program Delivery unit	CCI Nice Côte d'Azur
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketing Facilitation Financial advice
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Ambition/targets	Market based
Beneficiaries	SMEs
Funding Vehicle	Equity/Own Funds Financial institutions Property Owners ESCOs
Financial Instruments	Loans Grants Utility incentives EPC Financing

Summary

Eco'Energies is an energy efficiency program developed by the Chamber of Commerce (CCI) Nice Côte d'Azur of the Alpes-Maritimes and Var departments to assist small and medium sized enterprises in the tertiary and industrial sector by facilitating the energetic renovation of their buildings and/or industrial sites.

It is targeted at enterprises in the Alpes-Maritimes and Var departments that are part of the Provence Alpes Côte d'Azur (PACA) region, in the south-east of France.

The program is focused on 6 target groups:

- Hotels
- Health sector (hospitals and elderly homes)
- Distribution sector (retail, supermarkets, department stores,...)
- Logistics sector
- Industry
- Office buildings

The CCI pre-identifies the savings potential and invites a number of preselected Energy Service Companies (ESCOs) to develop a proposal for an Energy Performance Contract (EPC). The first phase of the project includes 5 ESCOs, 3 with a national coverage and 2 regional ESCOs.

The program is in its initial stage of development with a number of ongoing projects.

No results on investments or realized savings are available at this stage.

The program is however interesting, as it is one of the only ones in Europe that specifically target the sector of Small and Medium-Sized Enterprises (SMEs).

How does it work?

The CCI follows a 3-steps approach:

- Identification of the energy savings potential
 - (Free) preliminary visit and audit by a representative of the CCI. The CCI has developed a tool to collect key data and transmit this directly to the shortlisted ESCOs.
 - The ESCO realizes a more detailed (free) audit and makes a preliminary proposal for the energy performance and financing.
- Establishment of the EPC contract (the CCI assists the customer where necessary)
 - Drafting and signature of the EPC contract, based on a standard contract, between the ESCO and the enterprise customer
 - Financing of the works and reimbursement based on the guaranteed savings
- Implementation of the energy savings guarantee
 - Execution of the works by the ESCO
 - Guaranteed operations and maintenance of the site, for the total contract duration
 - Follow-up of the guaranteed performance

The main technical areas that are covered in the audits are heating, cooling, ventilation, lighting, hot water production and office equipment.

The average implementation time is 6 to 18 months. 90% to 95% of the savings are used to reimburse the investment.

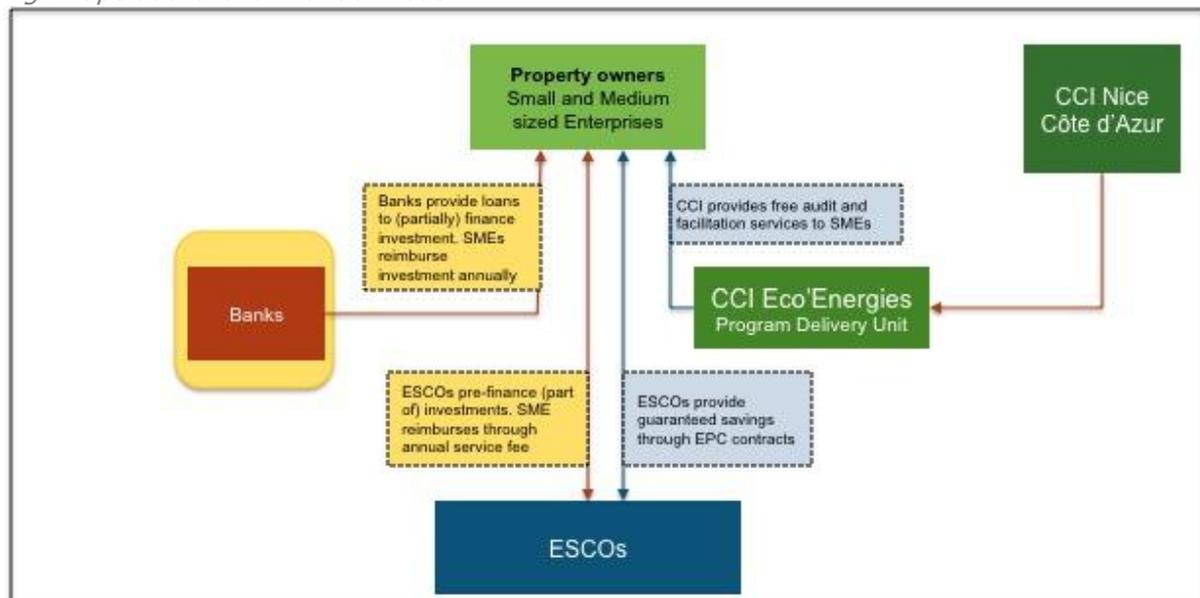
The service is targeted at about 2000 enterprises with an annual energy consumption of minimum 30.000 €/year (rather medium sized than small enterprises).

The addressed market is as follows:

Target group	Number of enterprises	Total annual energy consumption	Typical target
Hotels	307	53 M€	5*, 4* and 3* of > 100 rooms
Health	312	23 M€	Elderly homes of > 50 beds, private hospitals and clinics
Distribution	504	34 M€	> 350 m ² for food sector, otherwise > 600 m ²
Logistics	170	9 M€	2500 m ² if cold storage, otherwise > 5000 m ²
Office buildings	676 (+- 2 M m ²)	32 M€	Owner/manager of > 3000 m ²

No data is available for the Industry sector. For this sector the number of projects will in any case be quite limited.

Fig 1. Operational and financial model



The program delivery unit

The CCI Nice Côte d’Azur is the program delivery unit of the Eco’Energies programme that was launched in September 2014.

The unit operates as programme marketer, aggregator, facilitator and financial advisor.

Its core activities include:

- Marketing of the program towards the target audience of SMEs
- Identification of the energy savings potential
- Introduction of possible ESCOs
- Facilitation of the process of contractual agreement between the ESCO and the SME
- Assistance with the follow-up of the project

For organising the Eco’Energies programme, the CCI employs a staff of 2 full time equivalents (FTE), of which one half time project coordinator. They are funded on CCI internal budgets.

Legal structure	Governmental public administrative body
Shareholder description	Public company
Equity	N/A
Shareholders	CCI Nice Côte d’Azur
Program dedicated staff	Low
Program operational costs	Low

Organization and partnerships

None

Beneficiaries

Beneficiaries	Small and Medium Sized Enterprises
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Operational support	Project facilitation through the Program Delivery Unit
Financial support	Free energy audit

Funding mechanism

Program delivery unit funding	+ - 200 k€
Projects Funding	Projects are funded by the SME, through bank loans or by the ESCO. Projects are eligible for white certificates. This is a subsidy scheme in which energy savings project generate certificates that can be traded. Under such a system, producers or suppliers of electricity, gas and oil are required to undertake energy efficiency measures for the final user that are consistent with a pre-defined percentage of their annual energy deliverance. If energy producers do not meet the mandated target for energy consumption they are required to pay a penalty. The white certificates are given to the producers whenever an amount of energy is saved whereupon the producer can use the certificate for their own target compliance or can be sold to (other) parties who cannot meet their targets
Funding Vehicle	Equity/Own Funds Financial institutions Property Owners ESCOs
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Loans Grants Utility incentives EPC Financing

Achievements

The first projects are ongoing. There is no data available yet on investment volumes or savings.

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Fact sheet

General Info

Country	France
Model Name	Eco'Energies
Date of creation	2014

Model Description

Ownership	Public
Program authority	CCI Nice Côte d'Azur
Program delivery unit	CCI Nice Côte d'Azur
Operating services	Marketing Facilitation Financial advice
Implementation model	Energy Performance Contracting (EPC)

Type of projects	Energy Efficiency (building retrofits) Renewable energy
Beneficiaries	SMEs
Geographical coverage	Regional

Financial Mode Description

Project funding	Public
Project funding vehicle	Equity/Own Funds Financial institutions Property Owners ESCOs
Financial instruments	Loans Grants Utility incentives EPC Financing
Repayment model	Guaranteed Savings Agreement

Project risk Profile

Performance risk	ESCO
Recourse	Assets installed
Financial risk	Financial institutions Property owners ESCOs

Model Requirements

Staff Requirements	Low Less than 5 FTE
Equity or funding requirements	Low Less than 1 million €

Model Key indicators

Investment volume since creation	Unknown
Size of project (or project portfolio)	Unknown
Level of average energy savings	10% – 50%

Development maturity

Development/implementation stage	Start-up
Operational development maturity	Start-up
Financial development maturity	Start-up

Model Qualification

Level of establishment	New model
Growth of potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Low

Sources

<http://www.cote-azur.cci.fr/Services-aux-entreprises/Produits/Eco-Energies>

Jean-Christophe Clément, Présentation projet Eco'Energies, La solution pour réduire votre facture énergétique, @ESKIMO international workshop WebConf, 10 June 2015

Interview Jean-Christophe Clément by Lieven Vanstraelen, August 2015

Model 10

Energy Fund Den Haag - ED

The Hague territory - Netherlands

OWNERSHIP	PUBLIC
Program authority	Municipality of The Hague
Program Delivery unit	Energiefonds Den Haag (ED) C.V.
Implementation Model	N/A
Operating Services	Marketer Assessor Financier
Projects Financed	Renewable Energy Urban Development
Ambition/targets	Create a multiplier effect in investments in renewable energy in the territory of The Hague by the provision of 4M € revolving finance to urban development projects by 31 December 2015 and by attracting complementary private financing.
Beneficiaries	Project developers, housing corporations, businesses, foundations and NGO's and public entities e.g. municipalities, local authorities
Funding Vehicle	Investment Fund Financial Institutions Private investors Project owners
Financial Instruments	Loans Equity Guarantees

Summary

"Energiefonds Den Haag (ED) C.V.". is a revolving fund under the form of a limited partnership under Dutch law (*C.V. or Commanditaire Vennootschap*) incorporated by the Municipality of The Hague in 2013 and aims at providing revolving finance to urban development projects concerning renewable energy and energy efficiency.

ED has been created in the light of the European Commission's wish to have an alternative use of the available ERDF (European Regional Development Fund) funds which were mainly used as a grant instrument by the regions. An alternative use is for example the European Commission's policy initiative JESSICA (Joint European Support for Sustainable Investment in City Areas), designed to help Member States in using financial engineering mechanisms to support investment in sustainable urban development in the programming period 2007-2013. JESSICA's mechanism enables public funds to be invested in a repayable way, thus to be recovered and become available for further reinvestment in other urban development projects.

The municipality of The Hague wanted to have a leadership role in the development of this kind of financial instruments and decided to create a Holding Fund '*Holdingsfonds Economische Investerings Den Haag*' (HEID) to support integrated sustainable urban development within the framework of JESSICA. Based on a study in 2011 by the The Hague steering group of framework "Opportunities for West" (the programme framework being the beneficiary of ERDF funds) indicating that there was space and need for a fund for energy efficiency investments and a fund for spatial economic development, and in close cooperation with "Opportunities for West" and under guidance of the EIB, it started in 2012 a pilot for implementation of the JESSICA financial instrument. It created two JESSICA Urban Development Funds: JESSICA '*Energiefonds Den Haag*' (ED) focused on renewable energy and JESSICA '*Fonds Ruimte en Economie Den Haag*' (FRED) focused on the development of

small scale business premises and retail, both under the umbrella of the Holding Fund HEID. The three funds went operational on October 1st 2013.

The municipality aims at creating a multiplier effect in investments, through the revolving character of the funds, but also by attracting complementary financing at both the funds and projects level.

Energy Fund ED deploys financial instruments such as provision of equity, (subordinated) loans and guarantees at sub-commercial terms (below market conditions due to market failure) to private or public investors that carry out sustainable urban development projects. Its beneficiaries are, for example, urban development projects aiming at the enlargement of the district-heating network, geothermic drillings, and comprehensive energy supply for clusters of buildings and sustainable power stations feeding the district heating- and cooling network.

ED has received 4M € funding from the Holding Fund and has the obligation to pay out all funds to urban development projects by 31 December 2015.

An evaluation of the pilot project published in April 2015 based on results through the end of December 2014 revealed that, though no assurance could be given, the Energy Fund was on its way to achieve its loan granting target by the end of 2015. Though only one project of 72K € had materialised, there were 4 other projects for a total loan amount of 3,8M € that were in the process of being granted. In July 2015 it was announced that a second project, Green Well Westland, of 2M € had been granted a loan of 0,6M € and that the Holding Fund HEID had requested additional funding from its funding partners in order to assure the availability of necessary additional funding in the ED and FRED funds as a result of their success.

How does it work?

Initially the Municipality has created one Holding Fund and two Urban Development Funds:

- Holding Fund 'Holdingfonds Economische Investerings Den Haag' (HEID)
 - JESSICA Urban Development Fund 'Energiefonds Den Haag' (ED)
 - JESSICA Urban Development Fund 'Fonds Ruimte en Economie Den Haag' (FRED)
- The Holding Fund HEID forms a separate legal entity (Limited Partnership) and is governed by the Municipality of The Hague. It got initial funding of 8,9M € from the following sources:
 - ERDF funding through Regional Operational Programme West Netherlands 'Opportunities for West' for an amount of 3,7M€
 - Municipality of The Hague's Urban Development budget for an amount of 2,9M€
 - Municipality of The Hague's Cofinancing Fund for an amount of 2,0M€
 - National earmarked Cofinancing through 'Opportunities for West' for an amount of 0,3M€.

The Holding Fund defines the investment strategy and functions as an intermediary vehicle for the transfer of the funds to the Urban Development Funds and acts as controller and co-ordinator on behalf of Programme Authority The Hague. It controls the fund manager of the underlying funds, reports on the progress of the implementation of the investment strategy and performs risk and treasury management activities.

HEID has an Independent Investment Committee who is responsible for the strategic and performance review and who overviews the implementation of the investment strategy.

- The Urban Development Fund ED, which is an underlying fund of HEID, forms also a separate legal entity (Limited Partnership) and is being governed by an external Fund Manager (*Stimuleringsfonds Volkshuisvesting Nederland - SVn*) who has been appointed by HEID based on a public tendering process. ED aims at providing revolving finance to urban development projects related to renewable energy and energy efficiency within the territory of The Hague. The investment aid is being provided in the form of equity, (subordinated) loans and guarantees. ED got initial funding of 4,0M€ through HEID from the following sources:
 - ERDF funding for an amount of 1,7M€
 - Municipality of The Hague's Urban Development budget for an amount of 1,0M€

- Municipality of The Hague's Cofinancing Fund for an amount of 1,0M€
- National earmarked Cofinancing through 'Opportunities for West' for an amount of 0,3M€.

ED's Investment Committee supervises the performance and functioning of ED and advises and decides on the investment strategy.

ED has also an Advisory Committee, representing private and public investors. It advises the Fund Manager SVn on the allocation of funds to UDPs, so its prime task is to independently review the proposed investments.

ED is open to private funding i.e. investors following purely profit-oriented goals with market logic in the form of investment at risk. Private investors are invited by a transparent public procedure in order to address and attract as many investors as possible. Both private and public investment in ED are being made at the same conditions.

ED strives to reach minimum 50% private co-investment at risk. To this end, it is SVn's responsibility to attract sufficient strictly private investment at project level.

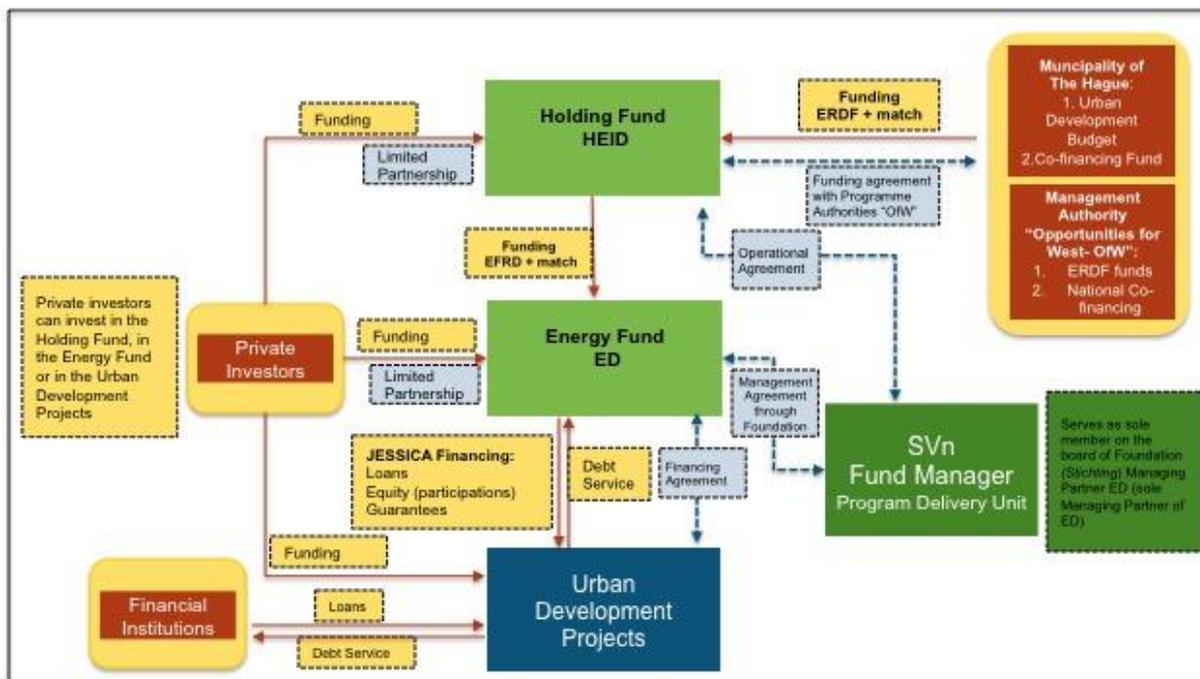
- Fund Manager (*Stichting Stimuleringsfonds Volkshuisvesting Nedelandse gemeenten - SVn*) make their investment decisions within the agreed investment strategy. They carry out the due diligence and financial appraisal in the project structuring phase, price the loan, establish the guarantee conditions, negotiate equity profit-sharing arrangements with other equity holders, and monitor project performance until the exit. SVn is also responsible for all monitoring and reporting requirements of ED.
- Urban Development Projects or Beneficiaries requesting aid from ED have to fit within the eligibility criteria set forth in the programme frameworks "Opportunities for West" and "Opportunities for The Hague" and need to contribute to the achievement of the investment strategy objectives. Projects will furthermore be appraised on the basis of other criteria like:
 - having an economically and technically sound business model and have a minimum prospect of financial viability
 - presenting a realistic business plan, soundness in terms of business model and financial sustainability
 - demonstrating a financial viability gap to justify the need for sub-commercial investments by ED
 - the existence of positive cash flow to prove the ability to be able to at least reimburse the investments increased by the inflation or interest rate

Prior to applying for sub-commercial conditions, beneficiaries need to demonstrate that reasonable efforts were taken to secure the maximum level of private finance under market conditions.

Possible beneficiaries of ED are project developers, housing corporations, entrepreneurs, foundations and non-governmental organisations (NGO's). Public entities such as municipalities may also be the beneficiaries of investment in urban development projects.

- SVn and the candidate beneficiaries follow a fixed credit application process with standard documents for credit application and credit agreements including 5 phases:
 - Phase 1: Negotiation phase
 - Phase 2: Credit analysis, preparation and submit advice request to Advisory Committee
 - Phase 3: Issue offer and offer accepted by beneficiary
 - Phase 4: Credit application refused or withdrawn
 - Phase 5: Credit application approved
- Amounts reimbursed by the beneficiaries will be used by ED to fund other urban projects.

Fig 1. Operational and funding model of Energiefonds Den Haag – ED



The program delivery unit

SVn, in its capacity as Fund Manager of ED, is the programme delivery unit of the Municipality of The Hague's energy fund programme. It acts as marketer, assessor and financier. It operates in accordance with the business plan which includes the fund's investment strategy as well as an indicative list of eligible projects. The Fund Manager has been appointed for a period of 10 years.

SVn is a professional fund management organisation of about 100 people, including supporting services and external associates. It specialises in fund management for the public sector.

Its main responsibilities and tasks include:

- Serve as managing partner of the Limited Partnership ED (as the sole member of the board of the Foundation Managing Partner ED/FRED).
- Unlimited responsibility for all obligations of the Limited Partnership
- The daily management and the financial management of ED.
- To consider the pipeline of possible investment projects and initiatives identified by the cities and other public and private sector stakeholders
- To take investment decisions regarding projects of final beneficiaries;
- To develop or increase awareness of the Energy Fund with a view of identifying potential investment proposals.
- To attract sufficient private investment at project level to match the initial public investment in order to leverage substantial additional private sector funding
- To encourage private investor contributions to the Energy Fund's capital to ensure that the initial investment in the Energy Fund is leveraged.
- To provide regular feedback on the management and the performance of the fund and the individual projects.
- To handle all required administrative formalities of the project application process up to the drafting and signing of the credit or investment agreement with the final beneficiary.
- To provide advice on the investment strategy to the municipality of The Hague and to the Programme and Management Authorities of "Opportunities for West".

SVn's fund management fees are capped at 2,9% per annum of the capital contributed to ED.

Legal structure	<i>Commanditaire Vennootschap (Limited Partnership)</i>
Shareholder description	N/A
Equity	N/A

Shareholders	N/A
Program dedicated staff	Low
Program operational costs	Low

Organization and partnerships

Municipality of The Hague : program owner and political initiator, 50% funding partner of ED through Holding Fund

ERDF (European Regional Development Fund): aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. ERDF funding in ED through Holding Fund HEID of funds made available to Management Authority "Opportunities for West".

JESSICA (Joint European Support for Sustainable Investment in City Areas): Uses the European Union Structural Funds' resources and national match-funding to support urban development projects that have a potential to contribute to sustainable urban development, but have an Internal Rate of Return (IRR) that is not sufficient to attract financing on a purely commercial basis. The support takes the form of repayable financing at sub-commercial terms.

Management Authority "Opportunities for West" (City of Rotterdam): Receives funds from ERDF for the provinces Zuid-Holland, Noord-Holland, Utrecht and Flevoland. Provides information on the programme, selects projects and monitors implementation. Has sub delegated the execution of the programme for the The Hague region to the Programme Authority The Hague.

Programme Authority The Hague: Is responsible for the implementation of the ERDF programme in the The Hague region. Is also responsible for the implementation of the JESSICA financial instrument and has final responsibility for Holding Fund HEID and the underlying Urban Development Funds.

SVn (Stichting Stimuleringsfonds Volkshuisvesting Nedelandse gemeenten): Fund Manager of Energy Fund ED and acts as the programme delivery unit. Offers the program delivery unit services: marketer, assessor and financier.

Energy Fund "Energiefonds Den Haag" - ED: Is the JESSICA Urban Development Fund underlying the Holding Fund HEID. Provides revolving finance to urban development projects related to renewable energy and energy efficiency within the territory of The Hague.

Holding Fund "Holdingfonds Economische Investerings Den Haag" – HEID: Holding Fund above ED and other Urban development Funds. Acts as pass through of funds received from funding partners to individual urban development funds, defines the investment strategy and acts as controller and co-ordinator on behalf of Programme Authority The Hague.

Stichting Holdingfonds Economische Investerings Den Haag: Foundation incorporated and managed by the Municipality of The Hague. Legal entity responsible for the requesting of funds from e.g. ERDF and Cofinancing Fund to be put in the Holding Fund.

Stichting Managing partner ED/FRED: Foundation established and managed by the Fund Manager. The foundation act as the sole managing partner of ED and is responsible for its management.

Beneficiaries

Beneficiaries	Project developers, housing corporations, businesses, foundations and NGO's and public entities e.g. municipalities, local authorities
Type of projects	Renewable Energy Urban Development
Operational support	No operational support
Financial support	Financing of the projects

Funding mechanism

Program delivery unit funding	SVn has been appointed as Fund Manager and receives a fund management fee capped at 2,9% of contribution capital of the fund
Projects Funding	Projects are being funded by the beneficiaries own funds or by their financial institutions, by private investors and by ED.
Funding Vehicle	Investment Fund Financial Institutions Private investors Project owners
Fund size	4M €
Fund type	Revolving fund
Fund sources	Municipality of The Hague, EFRD, Programme Authority "Opportunities for West"
Financial Instruments	Loans Equity (Participations) Guarantees

Achievements

SVn shows the following results as of 1 December 2014:

One project for an amount of 72K € has been approved and paid out to the "The Hague Football Club Laakkwartier". This project relates to the installation of solar panels on the roof of their club house.

Two projects for a total amount of 2,0M € were in credit analysis and approval process.

Two projects for a total amount of 1,8M € were in the negotiation phase. One additional project for which no details were available was also in negotiation phase.

Based on the most recent forecast as of 31/03/2015 the Fund manager was expecting 8 projects to be financed needing a funding volume of 7,7M €.

In July 2015 a second project for an amount of 600K € has been approved and paid out to Green Well Westland. This project relates to necessary bypass drilling works related to the beneficiary's geothermal project.

Project details are shown hereafter:

Date	Total investment	Private investment	Requested ED investment	Phase	Beneficiary
27/11/2013	1.100.000	0	500.000	1	FC Laakkwartier
20/12/2013	1.052.700	500.000	500.000	2	
06/02/2014	885.000	0	72.000	5	
15/05/2014	23.162.000	1.500.000	1.500.000	2	
30/05/2014	4.000.000	0	1.300.000	1	
	30.199.700	2.000.000	3.872.000		
?????	2.000.000		600.000	5	Green Well Westland

Contact details

SVn

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The Netherlands
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Factsheet

General Info

Country	Netherlands
Model Name	Energy Fund Den Haag -ED
Date of creation	2013

Model Description

Ownership	Public, open to private
Program authority	Municipality of The Hague
Program delivery unit	SVn (<i>Stichting Stimuleringsfonds Volkshuisvesting Nederlandse gemeenten</i>)
Operating services	Marketer Assessor Financier
Implementation model	N/A
Types of projects financed	Renewable Energy Urban Development
Beneficiaries	Project developers, housing corporations, businesses, foundations and NGO's and public entities e.g. municipalities, local authorities
Geographical coverage	Local (0,5M inhabitants - municipality)

Financial Mode Description

Project funding	Public, Private
Project funding vehicle	Investment Fund Financial Institutions Private investors Project owners Property owners Financial institutions
Financial instruments	Loans Equity Guarantees
Repayment model	

Project risk Profile

Performance risk	N/A
Recourse	Unknown
Financial risk	Investment Fund Project Owners Private investors Financial institutions

Model Requirements

Staff Requirements	Low Less than 5 FTE
Equity or funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	+/- 4M €
Size of project (or project portfolio)	0,8M € to +23M€
Level of average energy savings	Unknown

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Moderate

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Model 11

Energies POSIT'IF

France – Île-de-France

OWNERSHIP	PUBLIC
Program authority	Région Île-de-France
Program Delivery unit	Energies POSIT'IF
Implementation Model	Separate Contractor based (SCB) Energy Performance Contracting (EPC)
Operating Services	Marketing Aggregation Facilitation Integration Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Ambition/targets	Ambitious renovation of minimum 60%, up to 75%, including isolation
Beneficiaries	Residential multifamily apartment buildings
Funding Vehicle	Financial institutions Property owners Investment funds
Financial Instruments	Equity/Own funds Loans Grants Utility incentives (white certificates)

Summary

Energies POSIT'IF was created in 2012 as public-private partnership (société d'économie mixte or SEM) by the Île-de-France region.

By January 2013 it had raised a capital of 5.323.500 € from the region, the cities of Paris and Créteil municipalities, private and public banks and several local communities of municipalities.

The initiative was created to promote, organise, support and implement the energy transition of the Île-de-France region. It acts as an integrated service provider offering technical design, implementation and operations, financing and insurance services to owners of multifamily residential apartment buildings.

The target audience of Energies POSIT'IF are 1 million multifamily apartment buildings (condominiums) with an EPC certificate of E, F or G (230 to 450 kWh/m²/year), which represents 47% of the total residential houses in those classes.

Energies POSIT'IF aims to be a pioneer of third party financing of the energy renovation of residential apartment buildings, to compensate for the lack of initiative from the private sector on this segment. The aim is to use a significant amount of energy savings to pay for the investments.

Energies POSIT'IF acts as a public ESCO to integrate the different steps of the process, with an aim to reduce transaction costs (information, strengthening of the capacity of the home owners, feasibility studies, quality control, follow-up, etc.).

The project is supported by the European Commission through its MLEI-PDA (Mobilising Local Energy Investments – Project Development Assistance) program, now called Horizon2020 program.

In 2015, Energies POSIT'IF reported a structural agreement with the European Investment Bank as part of a global 400 million € financing program for residential homes in France.

How does it work?

The principles on which Energies POSIT'IF works are as follows:

- Offer a turnkey service offering to multifamily apartment co-owners on all technical, financial and insurance aspects
- Mobilize and secure a supplementary financial resource: the future energy savings
- Assist the co-owners in organizing the financial plan of the operation
- Discharge the co-owners from having to pre-finance whole or part of the energy saving investment

The Project Development Unit offers the following services

- Energy audit to identify the energy savings potential and financial implications
- Establishment of a mandate from the co-owners to the property management association (syndicus)
- Establishment of a contractual agreement that covers the energy renovation project
- Outsourcing to architects, engineering companies, energy service companies (in case performance guarantees are required) and contractors
- Offering of a number of options:
 - Follow-up of the energy performance
 - Maintenance
 - Repair
 - Performance guarantee
 - Third party financing option
- Assistance with the financial structuring, including loans at low or zero interest rates, subsidies (from the Agence National de l'Habitat (Anah), from the French national energy agency ADEME and from local authorities), white certificates, bank loans.

In terms of financings, there are two cooperation models between the condominiums and Energies POSIT'IF:

- Energies POSIT'IF provides its financial engineering services to the condominiums. It develops a global financing plan for the building energy renovation which consists of individual financing plans adapted to each home owner. Individual financing plans can include self-financing of the apartment owners, grants and subsidies (national, regional or local) for which they are eligible and a bank loan. Condominiums can also take a collective loan involving all interested home owners. The condominiums are in direct relation with the banks via a globally structured contract. They pay Energies POSIT'IF for the renovation works as well as a fee to for its services. Energies POSIT'IF acts as an intermediary between the condominiums and technical partners that carry out the renovation works (e.g. the Energies POSIT'IF pays the suppliers for the works). However, it does not provide any additional financial sources.
- Energies POSIT'IF provides its financial engineering services and additional financing sources to the condominiums. In this case, Energies POSIT'IF develops a global financing plan for the condominiums; it seeks the third-party financing sources (in form of a bank loan) on behalf of the condominiums and provides them with additional financial sources from its own budget. It acts as an intermediary between the condominiums, technical partners and banks. The condominiums are in direct contact only with the Energies POSIT'IF, they pay monthly (or semestrial) instalments and a service fee to Energies POSIT'IF. Energies POSIT'IF then pays back to the banks.

The beneficiaries reimburse the renovation costs through regular payments (instalments) which take into account the financial savings generated thanks to reduced energy consumption. However, the payments are not always equal or lower than the financial savings achieved. The condominiums may decide to pay higher instalments and so shorten the pay-back period or, in some cases, the instalments are high due to too high renovation costs that include measures that do not generate (or generate too little) energy savings.

A typical financing structure is the following:

- Owners' self financing (including individual loans): 50%
- Grants (including white certificates) pre-financed by Energies POSIT'IF: 15%
- Third Party Financing from Energies POSIT'IF: 35%

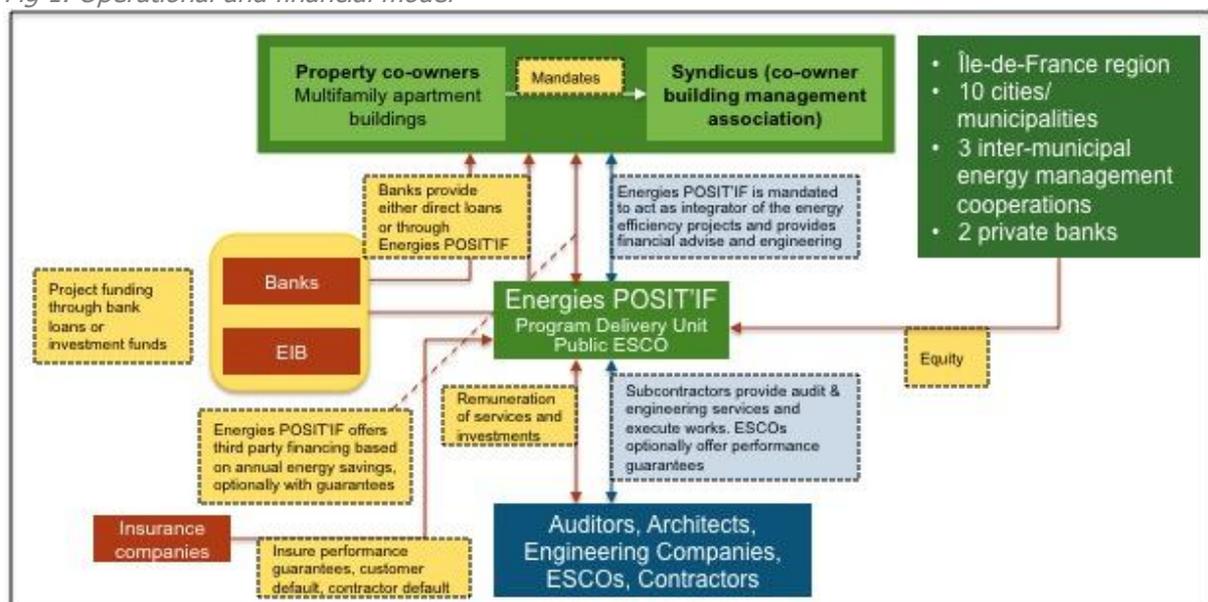
Two reimbursement schemes are used:

- Reimbursement through an annual third party financing fee
- Anticipated reimbursement in case of change of home ownership

Energies POSIT'IF also assists the co-owners to obtain fiscal advantages, in particular national tax exemptions. These include both tax rebates and tax subsidies.

The objective is to be ambitious in terms of energy savings and reach levels of 60% and more.

Fig 1. Operational and financial model



The program delivery unit

Energies POSIT'IF is the program delivery unit and acts as programme marketer, project integrator, facilitator, project financial advisor and assessor.

Its core activities include:

- Identification of multifamily home owners and buildings
- Identification of energy savings potential
- Outsourcing to and integration of architects, auditors, engineering companies, energy service companies and contractors
- Financial advice and financial engineering
- Communication, capacity building and networking

Projects vary from 1 to 20 M€. For one single home of 60 m² a thermal renovation (heating and isolation) has an average cost of 25.000 €.

Energies POSIT'IF has a strong leverage effect: every euro invested by the company allows to create 8 to 14 euros investment in total.

Energies POSIT'IF fixed following objectives:

- 1000 individual homes renovated per year, with an objective of 10.000 over a 10 year period

In addition to the energy renovation of apartment buildings, Energies POSIT'IF also invests in renewable energy projects.

For the period 2013-2015, 2 M€ was allocated, split in following budgets:

- 1,4 to 1,6 M€ allocated to minority participations in 3 projects ranging from 400 k€ to 600 k€. These include PV solar, biomass based heat production, biomass based cogeneration, bio-methanisation and wind energy.
- 300 k€ to 400 k€ allocated to the development of 11 projects ranging from 25 k€ to 40 k€.

Some key numbers on employment creation:

- 1 M€ invested in isolation works creates 26 FTEs of employment
- 1 M€ invested in renewable energy creates 6 FTEs of employment

Energies POSIT'IF employs a staff of 10 people.

Legal structure	Public-Private company (Société d'Economie Mixte or SEM)
Shareholder description	Public-Private company
Equity	5,323 million €
Shareholders	Région Île-de-France Caisse d'Epargne Île-de-France Caisse des Dépôts et Consignations Conseil Général 94 Ville de Paris Conseil Général 77 SIPPEREC CA Est Ensemble CA Cergy-Pontoise CA Val-de-Bièvre CA Plaine-Commune CA Sud-de-Seine SIESM 77 Ville de Créteil CA Plateau-de-Saclay SIGEIF
Program dedicated staff	10 FTE
Program operational costs	Unknown

Organization and partnerships

None

Beneficiaries

Beneficiaries	Multifamily apartment co-owners
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Operational support	Projects integration through the project delivery unit
Financial support	Turn key financial engineering involving banks, investment funds, grants and fiscal advantages

Funding mechanism

Program delivery unit funding	Energies POSIT'IF
Projects Funding	Projects are funded through home owners own funds, bank loans, European investment funds (EIB), grants and fiscal advantages
Funding Vehicle	Financial institutions Investment funds

	Property owners
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity/Own funds Loans Grants Utility incentives (white certificates)

Achievements

In 2015, Energies POSIT'IF reported accompanying 21 co-owner associations at different stages of development (audit, project assistance, design and implementation) covering about 3200 individual homes for a total investment of over 50 millions euros VAT incl.

The project pipeline has increased to 60 condominiums, with a total of 18 contracts signed.

In 2015 more than 30 million € of works are to be signed, covering the renovation of 2553 apartments.

Contact details

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Factsheet

General Info

Country	France
Model Name	Energies POSIT'IF
Date of creation	2012 (Legal structure and capital in 2013)

Model Description

Ownership	Public-Private
Program authority	Île de France region
Program delivery unit	Energies POSIT'IF
Operating services	Marketing Integration Financial advice Financing Assessment
Implementation model	Separate Contractor based Optionally with performance guarantees: Energy Performance Contracting (EPC)
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Beneficiaries	Multifamily apartment co-owners
Geographical coverage	Regional

Financial Mode Description

Project funding	Public Private
Project funding vehicle	Financial institutions Investment funds Property owners

Financial instruments	Equity/Own funds Loans Grants Utility incentives (white certificates)
Repayment model	N/A

Project risk Profile

Performance risk	Property owners Optional: PDU
Recourse	Not applicable
Financial risk	Property owners

Model Requirements

Staff Requirements	High More than 10 FTE
Equity or funding requirements	Moderate Less than 10 million €

Model Key indicators

Investment volume since creation	50 millions € (ongoing)
Size of project (or project portfolio)	1 M€ – 20 M€, average 3 M€
Level of average energy savings	> 60% (up to factor 4 = 75%)

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	Moderate
Replicability of the model	Moderate
Impact on public balance sheet	Moderate

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Annexe 4.4 : Fiche régionale – Région Ile de France – SEM Energies Posit'IF

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Model 12

Community based Renewables - Climate Community Saerbeck

Saerbeck – Germany

OWNERSHIP	PUBLIC
Program authority	Municipality of Saerbeck
Program Delivery unit	<i>Energiemanagement</i> Saerbeck (Project Management Office)
Implementation Model	Production of Renewable Energy (Separate Contractor Based)
Operating Services	Marketer Assessor Project Manager
Projects Financed	Renewable Energy Energy Efficiency
Ambition/targets	To achieve climate neutrality and be energy autonomous by 2030
Beneficiaries	Multiple societal stakeholders: citizens, associations, local authorities, businesses, farmers, regional authorities
Funding Vehicle	Property Owners/Own funds (Local Authorities, Businesses) Citizens Public Private Partnerships Financial institutions
Financial Instruments	Equity Loans Grants

Summary

“*Klimakommune Saerbeck*” (Climate Community Saerbeck), a local energy initiative of the community of Saerbeck, is a success story on how to organise energy transitions at local level.

It actually started in 2008 when the municipality, after very positive experiences with results of a citizens driven initiative to install photovoltaic (PV) panels on the roofs of municipal buildings, adopted a resolution to switch the energy supply of the whole municipality to renewable energy sources. Its objective was to become independent from the incumbent energy supplier and assure that the whole energy power supply in Saerbeck (for families, businesses and public lighting) be based on own produced renewable energies by 2030.

One year later, in 2009, the municipality won a regional competition organised by the federal state of North Rhine-Westphalia and was allowed to call itself “Nordrhein-Westfalen Climate Community of the future” opening the door for funding and marking the beginning of the path towards execution of their ambition to achieve climate neutrality and be energy autonomous by 2030.

In the context of the regional competition the Saerbeck roadmap to achieving the ambition had been set forth in the municipality’s Integrated Climate Protection and Climate Adaptation Concept (in German IKKK, *Integriertes Klimaschutz- und Klimaanpassungskonzept*), describing seven areas of action, out of which three are lead projects, and 150 single measures.

Cornerstone of the local energy initiative was the successful association of and cooperation between the municipality of Saerbeck and multiple societal stakeholders (citizens, associations, the planning office, local government, businesses and farmers,...). The driving force was its steering committee, composed of 12 to 14 individuals (residents, scientists, economists, engineers, ...), including a Project Manager, a Communications Manager and the municipality’s Mayor.

Today the community has installed over 438 PV installations on the roofs of the private houses and schools, it is running its own local electricity grid, it has built a central heating plant conveying the concept of renewables in an educative manner and has transformed a former ammunition park in a

bio-energy park including 7 wind turbines, a biogas plant, a bio waste treatment plant with a digestion stage and a PV park. The community produces about 3,5 times more renewable energy than the local consumption and the annual per capita CO₂ emissions have decreased from 9 tons to 5,5 tons

How does it work?

Basis of the implementation of the Climate Community's energy transition is the execution of the Climate Protection and Climate Adaptation Concept (described in the Saerbecker Roadmap consisting of 7 areas of action and 150 single measures), and specifically three key projects :

- The sunny side of Saerbeck (*Saerbecker Sonnenseite*)
- Saerbeck Insights (*Saerbecker Einsichten*)
- Steinfurt Material Flows (*Steinfurter Stoffströme*) or the Bioenergy Park

The project "The Sunny Side of Saerbeck") focuses on investigating the potentials of energy efficiency improvements and renewables applications in private and industrial buildings. The aim was to make citizens of Saerbeck part of the project of the Climate Community by encouraging them to install PV panels on the roof of their houses, farms and schools and to invest into making their houses and buildings more energy efficient (e.g. building insulation and the conversion of the primary energy supply to renewable resources)

An example is the collaboration with the local secondary school to determine the PV potential for the village's private buildings and to determine suitable roof areas for the capture of solar energy.

Citizens who wanted to join the initiative could get specific funding from local banks (e.g. Kreissparkasse Steinfurt and Volksbank Saerbeck) and incentives and obtain energy consultancy.

The project "Saerbeck Insights-future energies made transparent" focuses on making topics such as energy savings, energy generation and climate protection transparent and comprehensible to everyone.

The core of this project is the transparent heating plant in the town centre, a system of two large wood-pellet-fired heating boilers operating behind a glass façade to supply heat through a local heat-network to 2 schools, 2 sports facilities, a kindergarten and 4 other community buildings.

The project also includes an "Energy Experience Path" representing Saerbeck's climate education concept and specifically calling for the involvement of the community.

This central heating plant is also the community's information platform and communication hub for all questions concerning climate protection, climate adaptation and the use of renewable energies, it is the place where the monthly "Energierundstisch" or energy round table meeting is being held and it serves as the Climate Community's administrative office.

The project required an investment of 1,5M € and over 80% of the amount was covered by government grants.

The project "Steinfurt Material Flows" (*Steinfurter Stoffströme*) focuses on maximising synergy effects in the area of regional materials flow. It crystallised in the Bio Energy Park, which the community developed on the 90 ha site of a former munitions depot of the German Army acquired by the municipality in 2011. The Bioenergy park is host to a wind farm, a solar power park, a biogas plant and a biomass composting plant and is able to generate 29MW renewable energy power.

- The wind farm totals 7 wind turbines of 3-megawatt each.
- The solar power park features 24,000 PV panels installed in 2012 on the bunker walls. The park has a capacity of 5,7 MW_{peak} (can supply 1700 households)
- The biogas plant receives input of 300 ha of corn fields of 17 local farmers and the technical support is provided by local biogas firm Envitec.
- The composting plant takes care of the fermentation of all biological waste of Region Steinfurt (45K tonnes/year), it has a cogeneration capacity of 1MW electric power and 1MW heat, and has its own wind turbine (one of the seven).

Currently an investment amount of 70M € has been spent on the Bioenergy Park, completely financed by local and regional investors and citizens.

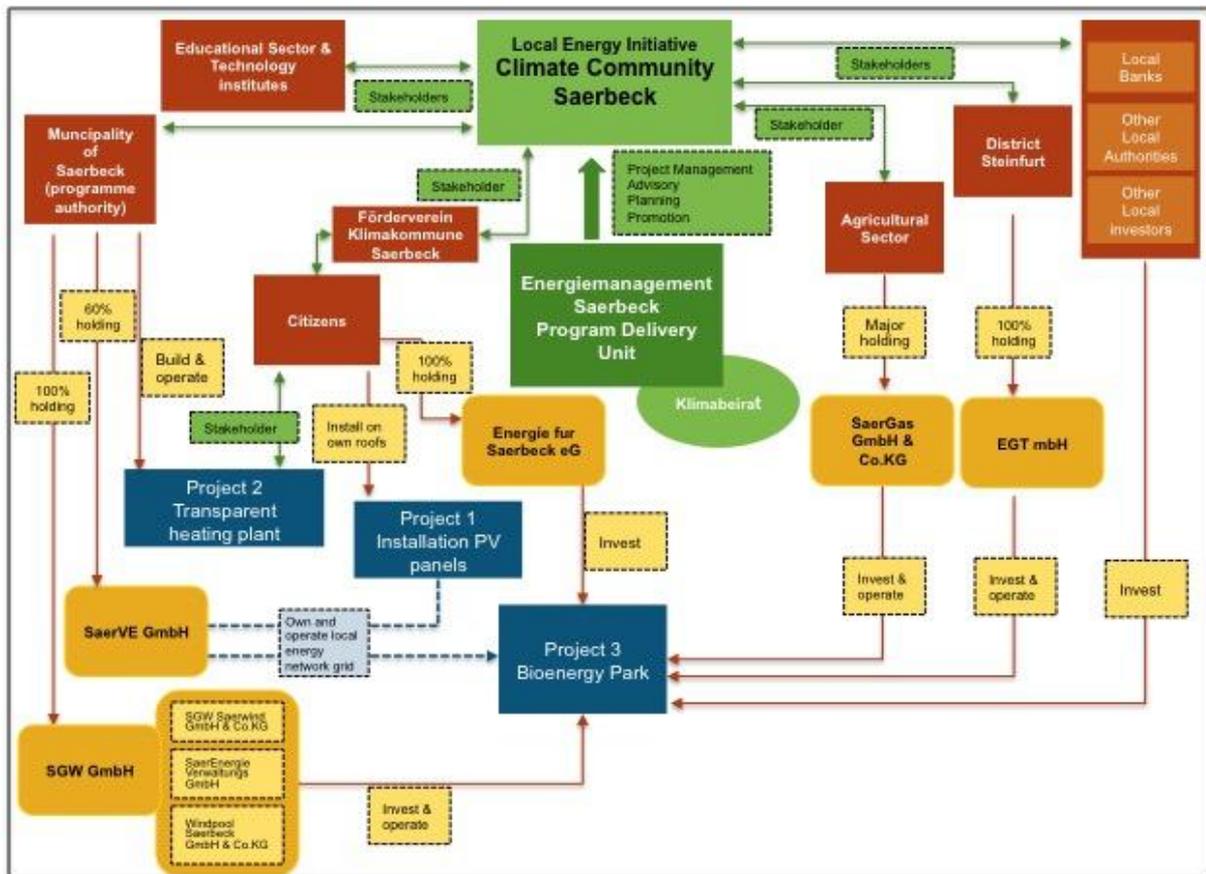
With the financial help of the federal state of Nordrhein-Westfalen and the EU the community is currently running a feasibility study on transformation and storage of renewable energy on the Bioenergy park site. It is testing storage capacity techniques based on Lithium-ion technology, power-to-gas, Redox-flow technology and on natrium-sulfur batteries.

It should also be noticed that the municipality is also operating its own (and only) local electricity grid through SaerVE mbH, participated for 60% by the municipality of Saerbeck and 40% by Stadtwerke Lengerich, a local (inter-municipal) energy provider.

Overview of investment amounts and funding of projects:

Projects	Investors/funding	Capacity MW	Investment in M€	Subsidies /grants
480 PV installations on roofs	Citizens	9,9MW peak	unknown	specific grants and incentives
Transparent heating plant	Municipality of Saerbeck		1,5	80% subsidy from government
<i>Bio-energy parc :</i>				
PV power Parc	63% citizens coop. "Energie for Saerbeck", 37% local Saerbeck investors	5,7MW peak	9,5	
1 wind turbine	Citizens cooperative "Energie for Saerbeck" SGW (100% municipality of Saerbeck)	3,0 MW	5	
1 wind turbine	EGST (District of Steinfurt) Sparkasse (savingsbank)	3,0 MW	5	
1 wind turbine	Steinfurt (regional investors)	3,0 MW	5	
3 wind turbines	Local Saerbeck investors	9,0 MW	15	
Biogas plant	Saergas GmbH & Co. KG	1,0 MW +1,0 MWth	10 (?)	
Composting plant	EGST (District of Steinfurt)	1,0 MW + 1MWth	15	
		38,6MW	71,5M €	

Fig 1. Major operational and investment flows



The programme delivery unit

The programme delivery structure behind the Climate Community Saerbeck is actually a tight cooperation between *Energiemanagement Saerbeck*, which is the Project Management structure of the municipality and the *Klimabeirat* or the climate advisory/steering committee established by the Mayor of Saerbeck. This committee consists of 12-14 individuals from the local community (residents, scientists, economists, engineers,...), including the project manager, a communications manager and the Mayor.

Energiemanagement Saerbeck plays a crucial role when addressing energy issues and the implementation of the Climate Concept. It has the expert knowledge, acts as translator and communicator in the outside society and towards energy institutions such as the *Deutsche Energie-Agentur* (German Energy Agency) or the *Bundesverband WindEnergie* (German Wind Energy Association).

It acts as marketer, promotor, coordinator and project manager of the Climate Community's energy transition strategy. This is all the more true for the role of the project manager who liaises people and individual projects with the overall Climate concept of Saerbeck.

The *Klimabeirat* represents a broad range of stakeholders and actors such as the educational sector, citizens associations, the Municipality of Saerbeck, the agricultural sector, schools & kindergarten, external experts, regional authorities, industry and businesses, financial institutions and other local partners. The steering group was called to develop the climate change adaptation and mitigation concept, to work out the strategy, the goals and the planning process with key roles for the Mayor, with whom final decisions lay, and the planner.

The working of the Climate Community is also supported by the *Förderverein*, a booster club of the citizens of Saerbeck.

Financial support came from different sources and parties such as the 1,1 M€ grant from the federal state of North Rhine Westphalia thanks to winning the Energy competition of 2008, the staff cost of a

project manager financed by the Federal Environmental Ministry or the work and effort put in by the staff of the municipality and especially the Mayor and some other grants from NRW and from European Union level.

Legal structure	None
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Unknown
Program operational costs	Unknown

Organization and partnerships

Climate Community Saerbeck (*Klimakommune Saerbeck*): local energy initiative of the community of Saerbeck, a cooperation of multiple societal stakeholders (municipality Saerbeck, district Steinfurt, civil associations, private and public education sector, agricultural sector, businesses and industry, local and regional organisations, financial institutions, other local and regional authorities,...)

Municipality of Saerbeck (Mayor's office): program and political initiator, drives the programme delivery unit and supports part of the operating costs of the delivery unit, invests in the RES projects through SaerVE and SGW GmbH (and its subsidiaries and limited partnerships)

Advisory/Steering Committee: developed the Climate Protection and Climate Adaptation Concept and the strategy.

Energiemanagement Saerbeck: Project Management and Planning Office. Offers the program delivery unit services: marketer and promotor, project manager, advice and planning.

Förderverein Klimakommune Saerbeck: A platform of citizen engagement and participation. Non-profit association or booster club created to support the work of the Climate Community.

Citizens Cooperative "Energie für Saerbeck" eG (*eingetragene Genossenschaft*): about 400 inhabitants with 4 Mio €, minimum investment: 1.000 €, maximum investment: 20.000€. Is an important investor in the RES projects. Has invested in the solar park and in 1 wind turbine at the bioenergy park site.

SaerVE or Saerbecker Ver- und Entsorgungsbetriebe GmbH: Owns the electricity concessions from Saerbeck. Shareholders: Municipality of Saerbeck (60%), Stadtwerke Lengerich GmbH (inter municipal, local energy supplier), 40%

Saergas GmbH & Co. KG: private company, ownership of 17 farmers, Envitec and Maschinenring Steinfurt-Bentheim. Operates and owns the biogas plant.

EGT mbH (*Entsorgungsgesellschaft des Kreises Steinfurt*): Waste management company of District Steinfurt. Operator and owner of the bio composting plant.

SGW GmbH (*Saerbecker Grundstücks- und Entwicklungsgesellschaft*) and subsidiaries: Saerbeck's real estate and development company. The municipality's investment vehicle. Owner of 1 wind turbine.

Beneficiaries

Beneficiaries	Multiple societal stakeholders: citizens, associations, local authorities, businesses, farmers, regional authorities
Type of projects	Renewable Energy Energy Efficiency
Operational support	Project Management and planning through the project delivery unit
Financial support	Unknown

Funding mechanism

Program delivery unit funding	Energiemanagement Saerbeck (Project Management Office)
Projects Funding	Projects are being funded on own funds by the Municipality of Saerbeck, directly by its citizens or through their Citizens Cooperative, by farmers and their organisations, by businesses, specific local investors and local banks. Projects are also being funded by loans from banks.
Funding Vehicle	Property Owners/Own funds (Local Authorities, Businesses) Citizens Public Private Partnerships Financial institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity Loans Grants

Achievements

The community (citizens, farmers, municipality, businesses, local banks, regional partners,...) has invested over 70M € in different RES projects. These projects have been fully funded locally and regionally. .

It achieved the:

- Installation of 438 PV units on the roofs of the private houses and schools
- Building of a transparent central heating plant
- Construction of a bioenergy park hosting:
 - 7 wind turbines
 - 1 PV park with 24,000 panels
 - 1 biogas plant
 - 1 composting plant

The community runs its own local energy grid.

The community has electricity generation capacity of near 40MW and produces 3,5 times more renewable energy than its local consumption and the annual per capita CO2 emissions have decreased from 9 tons to 5,5 tons.

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Factsheet

General Info

Country	Germany
Model Name	Community based Renewables - Climate Community Saerbeck
Date of creation	2008

Model Description

Ownership	Public Citizen Public/Citizen Private Public/Private
Program authority	Municipality of Saerbeck
Program delivery unit	<i>Energiemanagement</i> Saerbeck (Project Management Office)
Operating services	Marketer Assessor Project Manager
Implementation model	Production of Renewable Energy (Energy Supply Contracting)
Types of projects financed	Renewable Energy Energy Efficiency
Beneficiaries	Multiple societal stakeholders: citizens, associations, local authorities, businesses, farmers, regional authorities
Geographical coverage	Local (7,2 thousand inhabitants)

Financial Mode Description

Project funding	Public Citizen Private Public/Citizen
Project funding vehicle	Property Owners/Own funds (Local Authorities, Businesses) Citizens Public Private Partnerships Financial institutions
Financial instruments	Equity Loans Grants
Repayment model	Service Charge

Project risk Profile

Performance risk	Property owner
Recourse	Unknown
Financial risk	Property owner (own funds) Citizens Financial institutions

Model Requirements

Staff Requirements	Unknown
Equity Requirements	No equity required
Funding Requirements	Moderate Less than 5 million €

Model Key indicators

Investment volume since creation	70 million €
Size of project (or project portfolio)	
Level of average energy savings	

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth of potential	Large
Scalability of the model	High
Replicability of the model	Medium
Impact on public balance sheet	Medium

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Model 13

Cambridgeshire MLEI

UK – Cambridgeshire County Council

OWNERSHIP	PUBLIC
Program authority	Cambridgeshire County Council
Program Delivery unit	Cambridgeshire Low Carbon Delivery Unit
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketing Facilitation Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Ambition/targets	34 million € investment in energy efficiency and renewables in public buildings and infrastructure
Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Funding Vehicle	Investment funds
Financial Instruments	Loans EPC Financing (Off-balance sheet solutions for energy contracting services)

Summary

The Cambridgeshire Mobilising Local Energy Investment (MLEI) project was set-up in 2012 to initiate delivery of low carbon energy projects in Cambridgeshire. Its mission is to enable investment in renewable energy generation and energy efficiency schemes on a more significant scale than before. This involved the creation of an investment fund, a program delivery unit, delivery mechanisms and a pipeline of energy generation and energy efficiency projects.

MLEI builds directly from work on the Cambridgeshire Renewable Infrastructure Framework, which assessed the potential for energy generation across the County, taking into account the County's growth. This results in two factors, which made MLEI particularly interesting and important:

- Low carbon energy projects delivered as a result of MLEI are diverse – making the most of investment opportunities to maximise delivery wherever schemes are viable. Building fabric retrofits, renewable energy retrofits, low carbon energy generation for new buildings, standalone renewable projects and neighbourhood schemes (district heating) would all be possible in the long term.
- Use of public sector assets to facilitate step change – MLEI aims to facilitate the gradual change between where they are now and reaching the full potential for low carbon energy in Cambridgeshire. The projects initial outputs will use public sector assets to initiate this step change.

Specific objectives of the MLEI project during its operation have been:

- To set up a Low Carbon Investment Fund for Cambridgeshire, and attract investment to deliver low carbon infrastructure (30 M€ to 50 M€)
- To set up appropriate delivery mechanisms, through the Cambridgeshire Low Carbon Development Unit, managed to deliver retrofit and renewable energy projects financed via the Investment Fund

- To identify, develop and procure an investment programme for retrofitting and renewable energy projects of at least 17,03 Million €, focused initially on public sector and community based schemes

Strategic objectives of the MLEI project beyond its operational period are:

- To reduce the carbon footprint of Cambridgeshire through creation of long term sustainable finance opportunities up to 2020 and beyond.
- To develop a pipeline of projects including larger scale projects that can be funded and deliver transformational market change through building on the learning from this project.

There are 3 types of stakeholders involved.

- Investors – banks, fund managers (small and large), larger companies with investment capability or ambition, local businesses and entrepreneurs, public sector funding managers (Local Enterprise Partnership)
- Decision makers – MLEI local authority Members are the key decision makers for the Fund investments and its governance. They also have a role in the success of the MLEI policy environment that supports local energy investment and governance for any low carbon investment fund.
- Asset and Estate Managers – not necessarily just officers from local authorities and other public sector institutions, but also their subcontractors and advisors i.e. the people who can enable energy projects that utilise public assets and public or private sector funding streams.

The project, with a total budget of 1,117 M€ was co-funded by a grant from the Intelligent Energy Europe – Mobilising Local Energy Investments (IEE-MLEI) program, for an amount of more than 700.000 £ (900.000 €).

A consortium of local authorities, is delivering the project, lead by Cambridgeshire County Council, including South Cambridgeshire District Council, Huntingdonshire District Council and Cambridge City Council.

How does it work?

The program has 3 major parts:

Financing

The Cambridgeshire Low Carbon Investment Fund (CLCIF) is seeded with public sector money from the Public Works Loan Board (PWLB) and other sources of funding. It invests alongside structural funds (e.g. ERDF) and development banks (e.g. European Investment Bank (EIB), Green Investment Bank (GIB)) and levers private sector funding (debt or equity). Funding is provided for a mixture of short, medium and long-term projects of up to 25 years. Once the fund has placed its initial investments, the authorities can retain the fund to generate income, make the fund growing further or exit the fund by selling the portfolio of investments, i.e. re-finance, via community share offer, bond issue or sale to a fund to reinvest in more projects (revolving fund).

Development

The role of the Cambridgeshire Low Carbon Development Unit (CLCDU) is to develop a pipeline of investible projects and co-ordinate investment. It will draw in public sector funds and “crowd in” co-investment from the private sector by bundling projects to achieve scale, reducing transaction costs and mitigating project and commercial risks. Acting as a self-financing unit, it will generate income from projects through development/arrangement fees and long-term management fees. All Cambridgeshire local authorities, investing or otherwise, can bring forward projects and facilitate delivery.

Projects

A key objective of the CLCDU is to develop a portfolio of projects in the county across a range of sectors and technologies. Initial focus is the public sector estate including local authorities, fire department, police, health sector and schools. Working with its delivery partners (e.g. ESCOs) and

using a range of delivery models, the CLCDU will establish energy services and performance contracts that are bankable and pass risks to those that are best placed to manage them. It applies its expertise to unlock investments in commercial buildings, (renewable) energy infrastructure and community renewables as well as enable public and private investment into larger scale (renewable) energy projects.

The Cambridgeshire Low Carbon Investment Fund

A 3-step fund strategy was agreed:

- Step 1: Local Authority Fund – proof of concept
- Step 2: Public Fund – grow the pipeline
- Step 3: Joint venture/Commercial fund

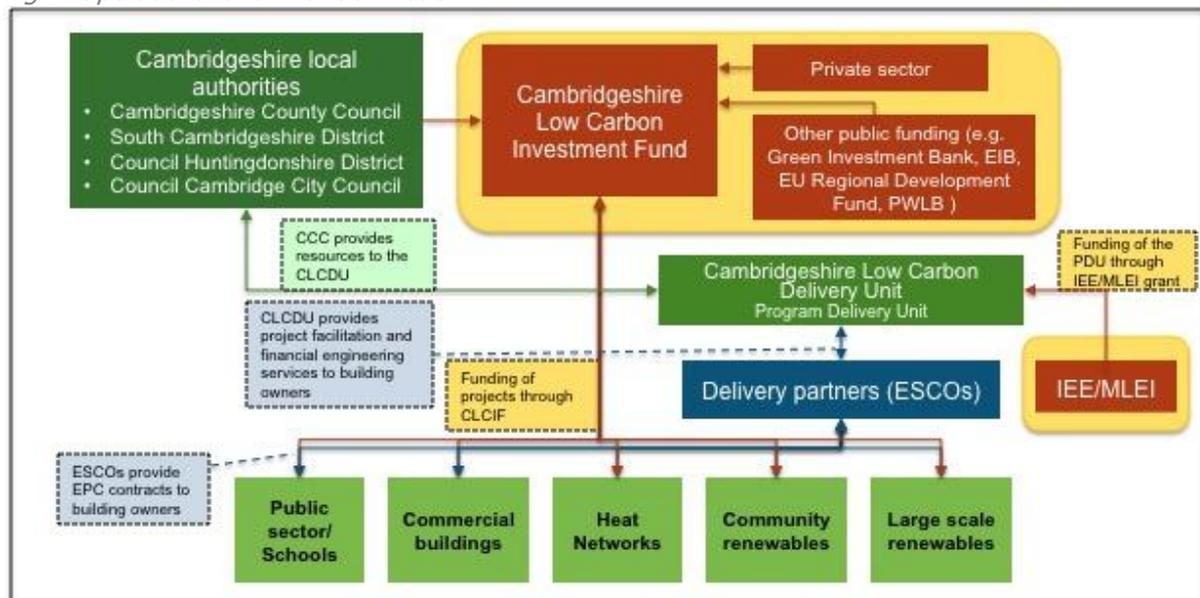
For step 1, the Local Authority Fund, following was agreed:

- 15 million £ (20 million €) borrowed from PWLB, a statutory body operating within the United Kingdom Debt Management Office, an Executive Agency of HM Treasury.
- Investment criteria agreed by the committee
- Key points for EPC project: 15 year pay back; benefit share with schools; reinvest part of the profits for large scale projects;

Goals

The investment programme up to end of August 2015 invested €18.05 million into twelve projects resulting in a reduction of 6502 tonnes of CO₂ per annum through energy efficiency and renewables, delivering 13,597,000 kWh/year and displacing 1,088 toe/year. The goal is to build on this investment programme and deliver over €3 billion of investment by 2030.

Fig 1. Operational and financial model



The program delivery unit

Cambridgeshire Low Carbon Development Unit (CLCDU) is the Program Delivery Unit for the Cambridgeshire MLEI program. It acts as marketer, facilitator, financial advisor, financier and assessor for the project.

Skills are drawn from across the Cambridgeshire County Council. Its key tasks are the following:

- Programme development
- Project management
- Business development
- Legal advice
- Finance modelling
- Contract development
- Value for Money (VFM) assessment
- Procurement
- Data collection
- Sales

Procurement of an ESCO delivery partner for schools and public buildings was secured through the Greater London Authority's RE:FIT 2 Framework. This framework was developed initially in London from 2011 to 2014 and made available nationally to other authorities. Access agreements have been signed with the GLA (Greater London Authority) in 2014.

The successful ESCO was appointed as a delivery partner on 1st August 2014. Their role is to visit sites and analyse data. Based on this, a series of proposals are made available to the asset owners decide whether or not they wish to proceed to a first stage contract to develop an Investment Grade Proposal..

An investment grade proposal includes a very detailed site based assessment is of energy efficiency improvements with a distinct focus on financial concerns and return on investment. Based on the outcome, asset owners/managers can then decide to proceed to a delivery contract, contract 2. After the completion of the works, an ongoing process of measurement and verification continues over the period of the contract as the delivery partner is guaranteeing the savings.

A support contract for the REFIT 2 Framework was signed with Local Partnerships to advise on the mini-competition and the development of the tender specification. In addition, Local Partnerships provide a quality assurance process and review a selection of project business cases to benchmark quality, price and savings.

To date, over seventy outline business cases have been delivered to asset owners/managers.

A first school (Milton (CofE) Primary School) signed up for an EPC pilot, including work on finance arrangements and finance models.

The CLCDU offers the following services to schools:

- Access to an EPC supplier (ESCO), procured by the Cambridgeshire County Council (CCC)
- Technical assessment of their energy needs and potential income opportunities
- A list of measures that can be installed to make savings and generate income
- A managed service or loan from CCC to invest upfront into the energy measures
- A 10 year contract that guarantees savings, the supplier pays the difference in case of under performance
- Technical expertise to manage and monitor the equipment to optimise its use and energy savings
- 10 year contract that maintains and replaces the equipment
- Support from relationship manager, to help solve any problems
-

For so-called Academy schools an off-balance solution was designed, called a Managed Service Agreement (MSA), and these are currently being delivered for five secondary academy schools..

Legal structure	N/A
Shareholder description	Public entity
Equity	N/A
Shareholders	Cambridgeshire County Council
Program dedicated staff	2.8 FTE
Program operational costs	€250,000 per year

Organization and partnerships

RE:FIT program

The Cambridgeshire MLEI program uses the RE:FIT framework to select ESCO's and assess their performance.

Beneficiaries

Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Operational support	Projects facilitation through the project delivery unit
Financial support	Loans through the Cambridgeshire Low Carbon Investment Fund

Funding mechanism

Program delivery unit funding	Fees are charged as part of the loan funding to projects.
Projects Funding	Projects are funded through the Cambridgeshire Low Carbon Investment Fund which uses loans from the PWLB and in the future it hopes will be supported by the EIB
Funding Vehicle	Investment funds
Fund size	30 M€ to 50 M€ (18,05 M€ engaged by August 2015)
Fund type	Public fund
Fund sources	PWLB
Financial Instruments	Loans EPC Financing (Off- balance sheet solutions)

Achievements

The MLEI Cambridgeshire project has delivered €18.05 million worth of low carbon energy projects by the end of August 2015.

There are currently two types of investment projects:

- Building retrofits of energy efficiency measures and renewable energy to public sector sites: schools, offices, libraries, leisure centres and other buildings
- Larger scale renewables projects including a 12MW Solar photovoltaic farm to be built on County Council-owned land.

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Factsheet

General Info

Country	UK
Model Name	Cambridgeshire MLEI
Date of creation	August 2012

Model Description

Ownership	Public
Program authority	Cambridgeshire County Council
Program delivery unit	Cambridgeshire Low Carbon Delivery Unit
Operating services	Marketing Facilitation Financial advice Financing Assessment
Implementation model	Energy Performance Contracting (EPC)
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Geographical coverage	Provincial/Departmental

Financial Model Description

Project funding	Public Private
Project funding vehicle	Investment funds
Financial instruments	Loans EPC Financing (Off – balance sheet solutions)
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Not applicable
Financial risk	Investment funds

Model Requirements

Staff Requirements	Low Less than 5 FTE
Equity or funding requirements	Low Less than 1 million € to seed fund the process

Model Key indicators

Investment volume since creation	18,05 M€
Size of project (or project portfolio)	12 projects current investments with a pipeline of more than 20 further projects
Level of average energy savings	15% - 37%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Moderate
Scalability of the model	Moderate
Replicability of the model	Moderate
Impact on public balance sheet	High

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Model 14

OxFutures

UK – Oxfordshire County

OWNERSHIP	PUBLIC
Program authority	Oxford City Council Oxfordshire County Council
Program Delivery unit	Low Carbon Hub
Implementation Model	Separate Contractor based
Operating Services	Marketing Facilitation Financial advice Financing Assessment
Type of projects	Renewable energy
Ambition/targets	20 million £ (26 M€) investment in renewable energy projects in public buildings and community infrastructure by the end of 2015.
Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Funding Vehicle	Financial Institutions Investment funds Citizens
Financial Instruments	Loans Grants

Summary

The OxFutures initiative is mobilising large-scale investment to develop renewable energy and energy efficiency projects across the city of Oxford and Oxfordshire county.

The aim is to position Oxfordshire at the forefront of low carbon innovation and lead on the UK's transition to a sustainable energy future. OxFutures has been kick-started by a grant from Intelligent Energy Europe to leverage investment of £20 million into local energy projects by 2016. It covers 75% of the costs towards a £1.3m programme to mobilise local energy infrastructure. The funded period started on 28th November 2012 and lasts for three years and has the following key targets:

- Leveraging investment in energy projects: 20 M£ (26 M€)
- Renewable generation capacity: 8,4 MW
- Demand reduction energy savings: 13.330.000 kWh
- Carbon emissions reductions: 7.900 tCO₂/year

The vision is for the River Thames and the rooftops of Oxfordshire to be the power stations of the future. Communities, businesses and the public sector will "power up" by developing renewable energy schemes and "power down" by reducing energy use. This is supposed deliver many economic, social and environmental benefits for Oxfordshire.

Local community interest social company "Low Carbon Hub" is the major partner to the two councils in delivering the four programme strands:

- The OxFutures Fund
- Investment on the public estate
- Community energy: powering up
- Domestic retrofit: community powering down (this has been limited to one pilot and will not be covered further)

The aim is to make low carbon economic development mainstream and to bring £400 million of investment into Oxfordshire by 2020. OxFutures will secure the City of Oxford's target to reduce its carbon emissions by 40% by 2020, and to reach the Oxfordshire County Council target of a 50% reduction in carbon emissions by 2030, based on 2008 levels.

How does it work?

The OxFutures initiative works as an umbrella programme, mainly for renewable energy projects. The Local Energy Hub acts as program delivery unit (PDU) to identify, accompany and kick-start renewable energy projects.

The main focus is mid-sized micro-hydro projects on the River Thames and urban PV solar projects on roofs of public buildings (mainly schools), community infrastructure and businesses.

The programme consists of two main axes:

- Developing an OxFutures Community revolving fund, using community share offers
- Providing technical assistance to community energy and retrofit projects

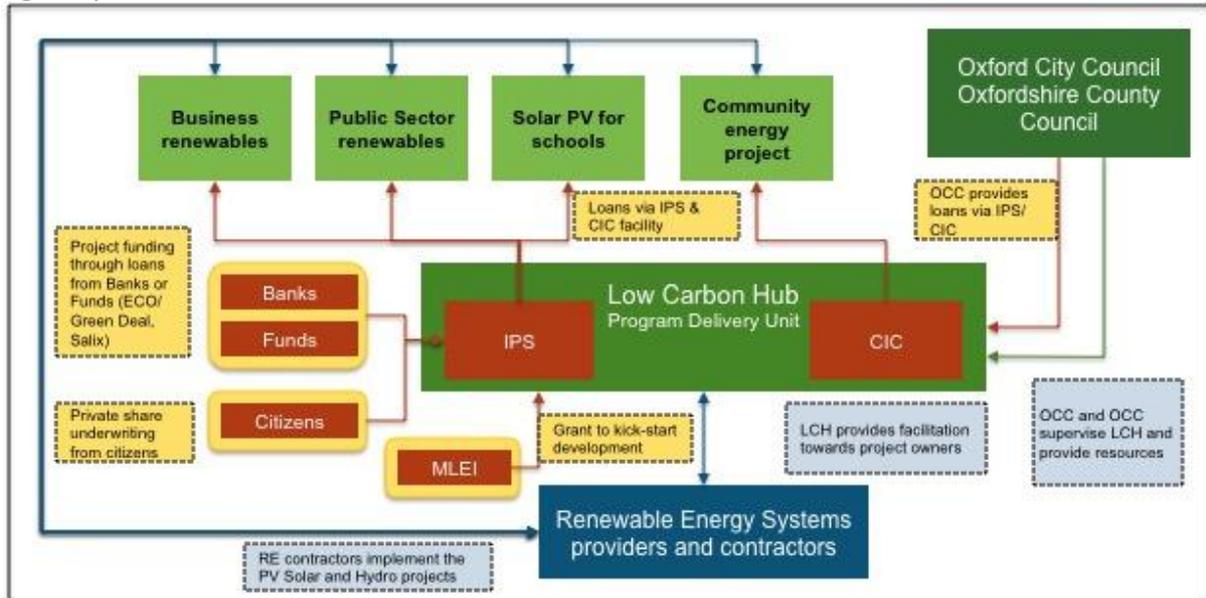
The Low Carbon Hub works with businesses, the public sector and communities to scale up renewable energy generation across Oxfordshire. It works like this:

- The Hub develops, installs and manages business and public sector projects;
- The Hub raises the finances through a community share offer so that local power is owned by local people;
- Local businesses and schools get discounted, green electricity and precious CO2 savings;
- Local investors get a fair financial return as well as a stake in local renewable energy generation;
- The Hub gets a sustainable income from the feed-in tariff and electricity sales;
- Community partners get support to deliver their own energy projects;
- Community schemes generate further income to support local carbon reduction schemes.

When financing projects, often the initial financing comes from a classical source (e.g. bank loan in the case of the Osney Hydro Lock project or a revolving facility from the Oxford City Council in the case of the Norbar Torque Tools PV project) and is then (partially) replaced by a community share offer underwriting.

In other cases projects are financed through ECO/Green Deal or Salix funds.

Fig 1. Operational and financial model



The program delivery unit

The Low Carbon Hub is a social enterprise that employs 12 people, set-up to work with 300 communities. It acts as marketer, facilitator, financial advisor and financier of the renewable energy projects.

The Low Carbon Hub comprises two organisations working in cooperation: the Low Carbon Hub Industrial and Provident Society (Low Carbon Hub IPS) and the Low Carbon Hub Community Interest Company (Low Carbon Hub CIC). Surpluses from the Hub IPS are passed to the Hub CIC to fund its work on community energy projects.

Low carbon hub IPS

The purpose of the Low Carbon Hub IPS is to develop a decentralised, locally-owned renewable energy infrastructure for Oxfordshire to put local power in the hands of local people. They do this by developing their own portfolio of renewable energy projects with businesses, schools and public sector partners. No capital investment is required from their partners. Projects include roof-top, ground-mounted and canopy solar photovoltaic installations (solar PV), micro-hydro schemes, and biomass. The Low Carbon Hub IPS raises the investment and is the owner of these energy generation assets. Surpluses from the Hub IPS are passed to the Hub CIC to fund its community benefit projects and supporting activities. An example of a Low Carbon Hub IPS project is the solar PV installation on Oxford Bus Company's depot in Cowley.

Low carbon hub CIC

The purpose of the Low Carbon Hub CIC is to deliver community benefit and provide practical support to communities to develop their own renewable energy projects on community assets. The projects provide cheaper electricity, an income for the local community and opportunities for local people to invest. The Hub team supports community volunteers through the complex process of setting up a social enterprise, developing their project, getting the project to investment-readiness and raising necessary finance. The process normally results in a local share-offer in which citizens can invest. Surpluses from community-owned enterprises are reinvested into further locally-managed carbon reduction projects. An example of a Low Carbon Hub CIC-supported project is Osney Lock Hydro in West Oxford.

In addition, the CIC is developing innovative low-carbon energy services and business models for communities to improve our renewable energy infrastructure. A part of the work of the CIC is influencing key stakeholders to create a supportive operating environment for community energy.

23 community group partners have a shareholding in the CIC to ensure their operation is totally transparent and is guided by those it is set up to serve. One community member is on their board of directors.

The Low Carbon Hub raised over 1.6 million £ (over an initial target of 1,5 million £) through a community share offer in autumn 2014 to develop 1MW of solar PV on local schools and businesses. This attracted 345 investors.

Legal structure	Social enterprise
Shareholder description	Public entity
Equity	1,2 M£ (1,6 M€)
Shareholders	Oxfordshire County Council Oxford City Council
Program dedicated staff	10
Program operational costs	unknown

Organization and partnerships

RE:FIT program:

Beneficiaries

Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Type of projects	Renewable energy
Operational support	Projects facilitation through the project delivery unit
Financial support	Loans through the Oxford City Council and share offering (loans) to the public

Funding mechanism

Program delivery unit funding	Low Carbon Hub received a 1,2 M£ grant from the IEE MLEI program
Projects Funding	Projects are funded through the Low Carbon Hub's IPS and CIC facility
Funding Vehicle	Financial Institutions Investment funds Citizens
Fund size	Unknown
Fund type	Public fund
Fund sources	Various
Financial Instruments	Loans Grants

Achievements

- €3.2m/£2.6m of investment has been secured for community renewable energy projects
- A further £3.6m of construction finance has been committed in principle for community-owned energy projects
- They Osney Lock 49 kWe microhydro project is in commissioning.
- 393kWp of solar PV have been installed or have signed contracts for community benefit projects on business roof spaces.
- A further 3MW of business community solar projects are expected to sign contracts by Nov 2015.
- 11 schools have installed a total of 529 kWp of solar pv panels with a further 40 schools engaged in the programme.
- 421 tCO₂/year savings are expected from projects that have secured investment so far

The following table provides an overview of the various projects in the pipeline:

Type of project	Project owner	MW installed	MWh generation	Investment (M£)	Timing
Solar	Schools	1,0	860	1,5	2014
Solar	Schools	2,0	1.720	2,5	2015
Solar	Southill Solar	5,0	4.300	5,45	2015
Solar	Businesses	0,4	351	0,4	2013-2014
Solar	Businesses	4,0	3.440	5,0	2014-2015
Hydro	Osney Lock	0,05	186	1,2	2013
Hydro	Abingdon	0,12	320	1,2	2015
Hydro	Goring	0,27	864	1,4	2015
Hydro	Sandford	0,43	1.300	2,7	2015
TOTAL		13	13.341	21,4	

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Factsheet

General Info

Country	UK
Model Name	OxFutures
Date of creation	2012

Model Description

Ownership	Public
Program authority	Oxford City Council Oxfordshire County Council
Program delivery unit	Low Carbon Hub
Operating services	Marketing Facilitation Financial advice Financing Assessment
Implementation model	Separate Contractor based
Type of projects	Renewable energy
Beneficiaries	Public sector Schools Commercial buildings Community (renewables)
Geographical coverage	Provincial/Departmental

Financial Mode Description

Project funding	Public Private
Project funding vehicle	Investment funds
Financial instruments	Loans Grants
Repayment model	Not applicable

Project risk Profile

Performance risk	Property owner
Recourse	Not applicable
Financial risk	Investment funds

Model Requirements

Staff Requirements	High More than 10 FTE
Equity or funding requirements	Moderate Less than 10 million €

Model Key indicators

Investment volume since creation	21,4 M£ (28 M€)
Size of project (or project portfolio)	0,4 – 5,45 M£ (0,5 – 7 M€)
Level of average energy savings	Not applicable

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	Moderate
Replicability of the model	Moderate
Impact on public balance sheet	High

Sources

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Model 15

Rotterdam Green Buildings (*Rotterdamse Groene Gebouwen*)

Rotterdam – The Netherlands

OWNERSHIP	PUBLIC
Program authority	Municipality of Rotterdam
Program Delivery unit	Project Management Bureau
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Facilitator Assessor Aggregator
Projects Financed	Energy Efficiency (building retrofits)
Ambition/targets	Enhance the sustainability of the municipality's whole core municipal property (about 1700 buildings)
Beneficiaries	Municipality of Rotterdam's owned public buildings: sports halls, swimming pools, schools, offices, theatres and museums
Funding Vehicle	ESCOs Financial institutions
Financial Instruments	EPC Financing Loans Grants

Summary

Rotterdamse Groene Gebouwen (Rotterdam Green Buildings) relates to the retrofitting of Rotterdam's municipal property and is an important component of the Municipality of Rotterdam's approach to climate mitigation in Rotterdam. The programme intends to enhance the sustainability of the municipal property by improving its energy performance and reducing its CO2 footprint, by optimising its maintenance and by improving indoor climate and comfort based on the principle of Energy Performance Contracting (EPC).

It is one of the programmes of the Rotterdam Climate Initiative (RCI), a climate programme started in 2007 by the Municipality of Rotterdam, the Port of Rotterdam, Deltalinqs (employers' organisation) and DCMR (Environmental Protection Agency Rijnmond). With this programme the municipality contributes to the ambition of the Rotterdam Climate Initiative which targets to reduce the emissions of CO2 with 50%, for the city as well as for the port, by 2025 relative to 1990, to become 100% climate change resilient and to strengthen the Rotterdam economy.

The programme's ambition is to enhance, in the long run, the sustainability of its whole core municipal property or social purpose real estate. The whole municipal property is related to about 3500 buildings and some 1700 buildings are considered to belong to the core portfolio. This core portfolio includes swimming pools, sports halls, offices, schools, museums and theatres.

Its approach is to pool or cluster buildings of the same type in order to increase the scale of the project, thus increasing its purchasing power and allow for transaction costs and energy efficiency optimisation.

The municipality planned to have 4 clusters tendered for retrofitting by 2014.

The pilot project of the programme related to a first cluster of buildings to be made sustainable through building retrofit and EPC contracting. It concerned 9 swimming pools considered to be major energy consumers within the municipal property. This first cluster was tendered in 2010 and got awarded to the ESCO in 2011.

After execution and experiences with the pilot project the municipality launched in 2014, with two other municipalities, two additional tenders relating to one cluster offices/workplaces (with the municipality of Schiedam) and one cluster of buildings with public function (with the municipality of Vlaardingen). So far only the municipality of Rotterdam's portion of the cluster offices/workspace has been awarded.

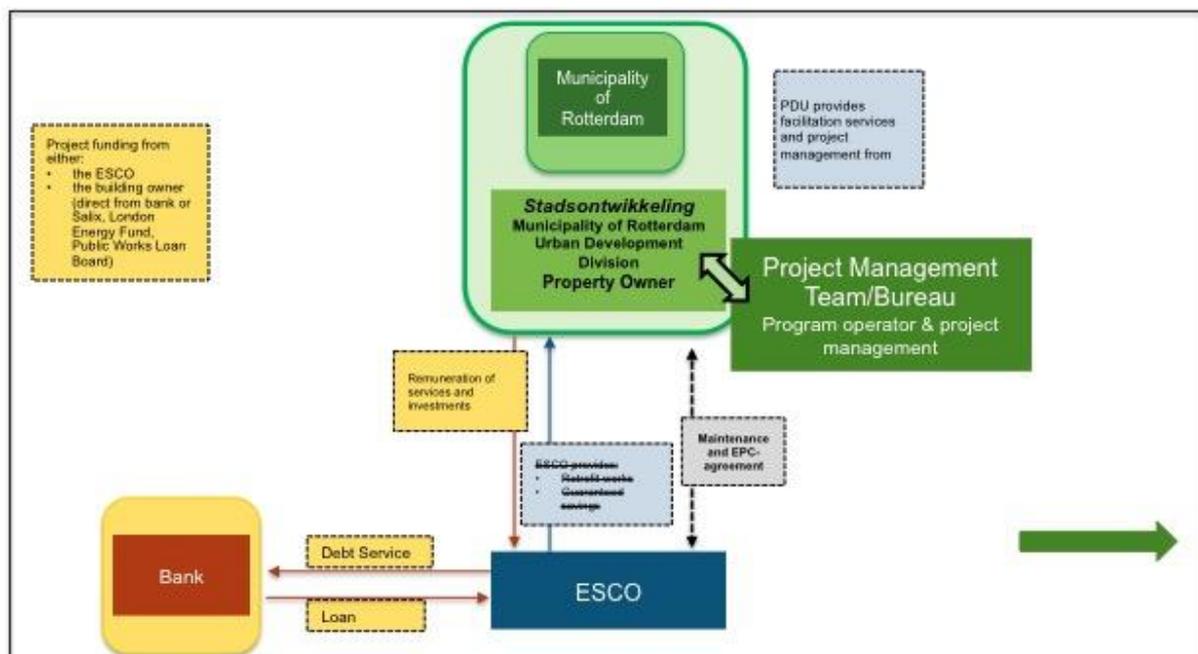
The programme received European Regional Development Funding through INTERREG North-West Europe (NWE), a Programme of the European Union to promote the economic, environmental, social and territorial future of the North-West Europe area.

The City of Rotterdam has invested about 1M € in the process costs of the pilot project.

How does it work?

- The Municipality of Rotterdam, through its Urban Development Division (today *Stadsontwikkeling*) is considering the retrofitting of its municipal property based on the principle of clustering of buildings.
- To this end, and based on the experiences with the pilot project, the clusters to be retrofitted are being identified and prioritised by the Urban Development Division based on an own developed assessment framework considering different technical, organisational, financial and legal criteria.
- Once the cluster to be retrofitted based on EPC contracting has been defined and has received approval for execution the procurement process of an ESCO can start.
- In this programme standard procurement rules apply and the UDP needs to initiate a tender process. The municipality has chosen for the competitive dialogue. The UDP has facilitated this tendering process by providing a series of standardised documents covering all the stages of the tendering process. The documents have been published and are available for use by any interested third party.
- The contract is awarded on the basis of most economically advantageous tender and a Maintenance and Energy Performance Contract (M-EPC) is concluded between the ESCO and the UDD.
- The selected ESCO installs the guaranteed energy efficiency measures and indoor climate improvement measures, delivers the service and carries out measurement and verification during the agreed contract period. Service also includes regular maintenance and management of the property.
- The Municipality has favoured a project financing structure based on third party financing and more specifically financing by the ESCO. The starting point is that the guaranteed reduction in energy charges will cover the investment and maintenance costs and, where possible, the improved end-user quality. The ESCO has the liberty to finance the investments based on its own funds or, at its discretion, with funding from a financial institution.
- The first retrofit cluster of 9 swimming pools, for instance, has for 10% been financed based on equity provided by the ESCO and for 90% by loans provided by a bank to the ESCO .

Fig 1. Operational and financial model



The program delivery unit

A Project Management Team (today Project Management Bureau - PMB) is the program delivery vehicle of the Rotterdam Green Buildings energy retrofitting programme. It acts as the project and programme management office of the programme under supervision of its steering group. The steering group is, headed by the director Real Estate (today Director Cluster *Stadsontwikkeling*) and represents the Municipality of Rotterdam. The steering group is the authority taking strategic decisions such as go/no go, it decides on risks, staffing, communications, etc.

The PDU takes care of the preparation and execution of the decisions of the steering committee.

It is responsible for the realisation of the project planning within the defined budget and the energy efficiency objectives set-forth. It is also responsible for the drafting of the ambition document and the tendering strategy and the development and continuous fine-tuning of best practice approaches, templates and standards.

The PDU has a major role as facilitator and project manager, this means, to manage and coordinate the entire retrofit process from cluster identification and contract tendering and negotiation to the implementation of energy efficiency measures and service delivery.

The PDU receives the support from other disciplines and various departments of the municipality of Rotterdam and from external specialists and consultants.

Today the cluster *Stadsontwikkeling* (Urban Development) of the municipality of Rotterdam has a full-fledged project management organisation known as the Project Management Bureau (PMB). PMB is part of the Project Management and Engineering Administration within the cluster Urban Development. PMB is the common home base for all physical projects related to Rotterdam's urban development. The Rotterdam Green Buildings programme is just one of the many programmes that they run.

The cost of the PMB are fully supported by the municipality of Rotterdam.

Legal structure	N/A
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Unknown
Program operational costs	Unknown

Organization and partnerships

City of Rotterdam: programme owner and political initiator

Project Management Bureau (PMB): is the permanent project management office of the municipality of Rotterdam. It provides staff, procedures, tools and services for the Green Buildings programme. It offers program delivery unit services such as project facilitation and project management.

ERDF (European Regional Development Fund): aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions.

INTERREG North-West Europe (NWE): programme of the European Union to promote the economic, environmental, social and territorial future of the North-West Europe area.

Beneficiaries

Beneficiaries	Municipality of Rotterdam's owned public buildings: sports halls, swimming pools, schools, offices, theatres and museums
Type of projects	Energy Efficiency (building retrofits)
Operational support	Project facilitation through the Project Delivery Unit
Financial support	N/A

Funding mechanism

Program delivery unit funding	Received funding from European Regional Development Funding through INTERREG North-West Europe (NWE),
Projects Funding	Projects are being funded by the ESCO.
Funding Vehicle	ESCO Financial institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	EPC Financing

Achievements

The Rotterdam Green Buildings programme has seen the following retrofitted until today:

A first retrofit of a cluster consisting of 9 swimming pools:

- Investment amount of 2,6M €
- Energy efficiency of 34%
- Saving of 43% gas, 56% electricity, 35% heating and 9% water
- CO2 emissions decrease of nearly 2000 tonnes
- Maintenance cost saving of 15%
- Improvement of water quality in 7 of 9 swimming pools.

The second retrofit project relates to a cluster of buildings, ownership of the municipality of Rotterdam, consisting of offices and workspaces for a total of 36.740 m². The contract started in January 2015.

Contact details

Municipality of Rotterdam

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Factsheet

General Info

Country	The Netherlands
Model Name	Rotterdam Green Buildings (<i>Rotterdamse Groene Gebouwen</i>)
Date of creation	2009

Model Description

Onwership	Public
Program authority	Municipality of Rotterdam
Program delivery unit	Project Management Bureau
Operating services	Facilitator Assessor Aggregator
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency (Buildings retrofit)
Beneficiaries	Municipality of Rotterdam's owned public buildings: sports halls, swimming pools, schools, offices, theatres and museums
Geographical coverage	Local 0,61 Million inhabitants

Financial Model Description

Project funding	Private
Project funding vehicle	ESCOs
Financial instruments	EPC Financing Loans
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	n/a
Financial risk	ESCO Financial institutions

Model Requirements

Staff Requirements	Moderate
Equity Requirements	n/a
Funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	<10M €
Size of project (or project portfolio)	>2,6M €
Level of average energy savings	34%

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Low

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Model 16

Energy Efficiency Milan Covenant of Mayors

Province of Milano – Italy

OWNERSHIP	PUBLIC
Program authority	Province of Milano
Program Delivery unit	Dedicated Project Implementation Unit
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketer Assessor Aggregator Facilitator Financial advisor
Projects Financed	Energy Efficiency (building retrofits)
Ambition/targets	Investment of 90M € in energy efficiency measures
Beneficiaries	Municipalities in the province of Milan adhering to the Covenant of Mayors initiative
Funding Vehicle	ESCOs Financial institutions
Financial Instruments	EPC Financing

Summary

“Energy Efficiency Milan Covenant of Mayors” is a pilot project implemented by the Province of Milan in 2009 in order to improve the energy performance of a group of public buildings in the province and to achieve significant primary energy use reductions based on the principle of Energy Performance Contracting (EPC). The programme is designed to facilitate and finance energy efficiency retrofits for mainly public school buildings located in selected small municipalities (<30.000 inhabitants) in the province of Milan and the Municipality of Milan participating in the Covenant of Mayors initiative.

The programme found its origin in a big scale energy audit programme, funded by Cariplo -a philanthropic banking foundation-, carried out between 2006 and 2008 in the region of Lombardy with the purpose to stimulate the implementation of energy efficiency measures in smaller municipalities. The foundation concluded afterwards that the energy audits programme had not resulted in a significant uptake of investments in energy efficiency, basically due to constrained budgets, reduced or absence of borrowing capacity and the lack of technical capacity to develop projects.

As a Territorial Coordinator of the Covenant of Mayors, representing many small municipalities, the province of Milan’s ambition with this programme is to meet the energy reduction targets set out by the Covenant, i.e. by 2020 reach 20% reduction in greenhouse gas emissions relative to 1990 levels (reduction of 9.000 tonnes CO₂), 20% share of renewable energy generation, and 20% reduction in primary energy use relative to projections.

Besides the significant reduction of final energy consumption of the building stock of small municipalities it wants to foster a mature ESCO (Energy Services Company) market able to offer EPC with guaranteed results and increase the know-how of the municipalities in governance matters related to energy efficiencies.

Based on a joint study with the EIB a potential investment of 90M € in energy efficiency measures was identified and could be realised and to that purpose a Project Implementation Unit (PIU) was set-up in 2009. From the 90M€ the EIB was willing to make 65M € available to the ESCOs in the form of loans through an intermediary commercial bank in the region.

The PIU manages the whole implementation process of the programme, from promotion of the programme and analysis and assessment of the projects to public tendering, contract negotiation, works implementation follow up and results reporting. It acts thus as programme marketer, assessor, aggregator, facilitator and financial advisor.

As of today a total amount of 13M € of investments in energy efficiency measures have been awarded covering 98 buildings in 16 municipalities.

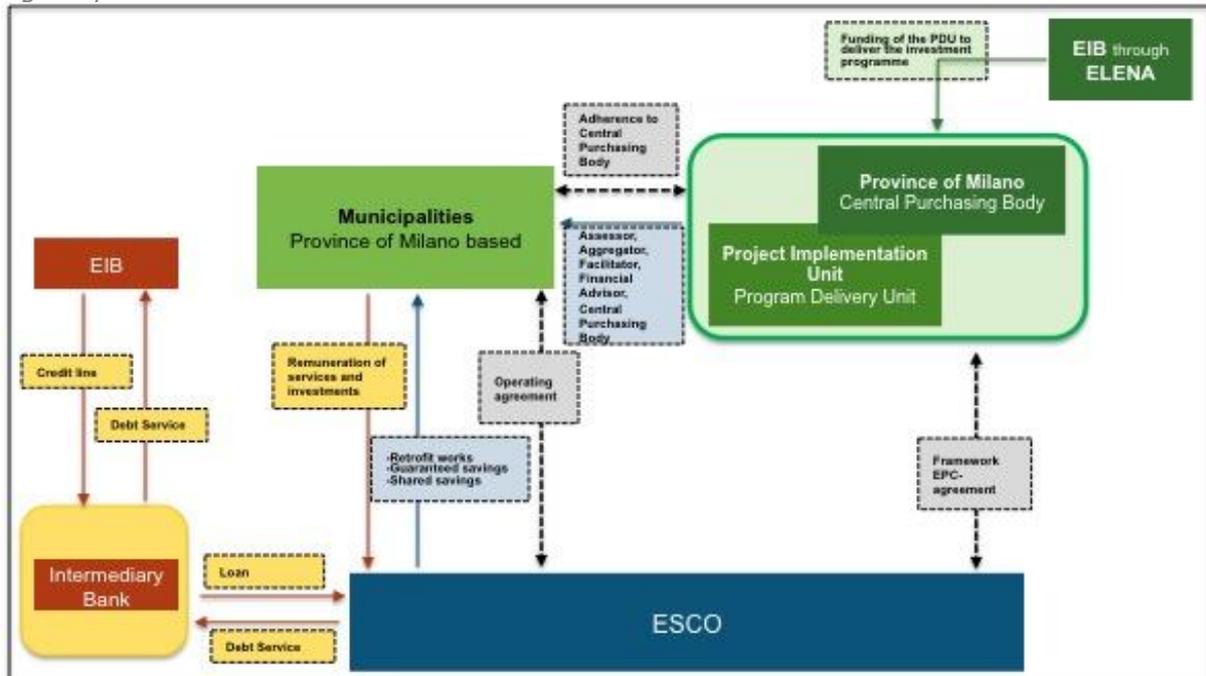
Though the initial investment ambition of 90M€ has not been achieved this programme has had the merit of being the first in Italy covering investments in energy efficiency measures solely based on EPC contracting on regional level. The project has upscaled the dissemination and recognition of EPC models in Italy, providing guidance to other public administrations involved in other ESCO projects.

How does it work?

- The Province of Milan has chosen to implement the retrofitting programme on the principle of aggregation or pooling of the selected buildings.
- The PDU plays an active role in the promotion and development of the programme. It contacts the municipalities adhering to the Covenant of Mayors to assess their disposition to participate to the programme and helps them to identify and prioritise the buildings for which energy audits will be performed.
- Once the buildings have been audited, assessed and have received approval for execution the municipalities must fully mandate the Province of Milan in its capacity as Central Purchasing Body.
- After joining the Central Purchasing Body the pooling of the buildings is being done. The PDU develops a feasibility study to support the municipalities through the whole process in its role as assessor, aggregator, facilitator and financial advisor. It also performs the procurement process for the selection of one or more ESCOs.
- Standard procurement rules apply in the designation of an ESCO. The Province has chosen for the concession of services-type (also known as restricted procedure) of tender in two steps, pre-qualification and invitation to tender.
- Once the contract is awarded a Framework EPC Agreement is being signed between the ESCO and the Province as Central Purchasing Body and an Operating Agreement is signed between the ESCO and the individual municipalities (after individual negotiations with the support of the PDU)
- The selected ESCO installs the guaranteed energy efficiency measures and delivers the service during the agreed contract period.
- The Province has chosen for a project financing structure based on third party financing and more specifically financing by the ESCO. The idea is that the majority of the guaranteed energy savings is being used for the reimbursement of the investment to the ESCO and that a small portion of the energy savings is being kept by the municipality as immediate savings on its budgets (shared savings).
- The ESCO has the liberty to finance the investments based on its own funds or, at its discretion from a financial institution or from the funding possibilities set-up by the EIB through the local intermediary commercial bank Mediocredito Italiano (Banca Intesa SanPaolo group).

- PDU was provided to the beneficiaries at no cost as a result of its 1,8M € funding by ELENA (European Local Energy Assistance run by the EIB) and the Province of Milan.

Fig 1. Operational and financial model



The program delivery unit

A dedicated Project Implementation Unit (PIU) is the programme delivery vehicle of the Energy Efficiency Milan Covenant of Mayors energy retrofitting programme. It is basically part of the public service structure of the Province of Milan.

The unit operates as programme marketer or promotor, assessor, aggregator, facilitator and financial advisor.

The role of the PIU is to:

- promote the programme among the municipalities that have adhered to the Covenant of Mayors
- analyse and assess the proposals related to potential investment projects
- coordinate and control of the required energy audits and baseline assessment and standardisation
- provide technical support for the implementation of the projects including follow up and supervision of the works
- Provide legal and administrative support throughout the entire implementation process, including drafting and providing of required documentation related to the tender process, coordination of the tender process, and negotiations with the ESCOs and financial institutions
- provide monitoring and audit related to performance and measurement and verification
- disseminate findings and results and transfer of knowledge to other public authorities

The PIU is structured in different groups. The core of the PIU is its Management Board (basically consisting of the dedicated project members, mostly process managers). It is supported by a Municipalities Committee (representatives from the municipalities) and by the Support Group. The Support Group consist of members of various departments of the Province of Milan. Three other groups, the Technical Group, the Legal-Administrative Group and the Monitoring and Reporting Group are being supervised by the Management Board though most of the tasks have been outsourced to external specialists and consultants.

Since 2010 the PIU operations have been funded for a total amount of 1,8M €. Of this funding amount some 90% or 1,62M € has been provided by ELENA and some 10% or 0,18M € by the Province of Milan.

The PIU aimed at leveraging the ELENA funding amount by 46 times in delivered capital investment or a minimum of 90Mio € by 2014. In the course of the programme the leverage has been downsized to 20.

Legal structure	N/A
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Moderate
Program operational costs	Moderate

Organization and partnerships

Province of Milan: Programme owner and political initiator, drives the programme delivery unit and supports part of the operating costs of the delivery unit.

Province of Milan Project Implementation Unit: Is the project delivery vehicle of the energy efficiency programme. It provides staff, procedures, tools and services for the program. It offers program delivery unit services such as marketing and engagement, project assessment, aggregation services, project facilitation and financial advice.

Municipalities: Are the beneficiaries of the programme if adhered to the Covenant of Mayor initiative.

ELENA (European Local Energy Assistance): Is a program funded by the European Commission's Intelligent Energy-Europe programme and run by the EIB to support local and regional authorities to achieve 20-20-20 targets. It scales up projects and reduces transaction costs and supports project development phases and capacity building

EIB (European Investment Bank): Secured finance to the programme. Acts both as lender for the financing of investments in energy efficiency and as administrator of the ELENA programme. It committed to provide 75% or 65M € of the 90M € investment objective through local financial intermediary Mediocredito Italiano (Intesa Sanpaolo Group).

Financial institutions: Mediocredito Italiano (Intesa Sanpaolo Group): Intermediary commercial bank for the EIB.

Fondazione Cariplo: Is a philanthropic banking foundation. It funded a big scale energy audit programme between 2006 and 2008 in the region of Lombardy with the purpose to stimulate the implementation of energy efficiency measures in smaller municipalities.

ESCOs: Energy Services Companies perform the work planned under the program and guarantee agreed savings to the beneficiaries.

Beneficiaries

Beneficiaries	Municipalities in the province of Milan adhering to the Covenant of Mayors initiative
Type of projects	Energy Efficiency (building retrofits)
Operational support	Project facilitation through the Programme Delivery Unit
Financial support	Project facilitation costs free of charge

Funding mechanism

Program delivery unit funding	The dedicated Project Implementation Unit has been funded by ELENA (1,62M €) and by the Province of Milan (0,18M €)
Projects Funding	Projects are being funded by the ESCOs

Funding Vehicle	Public ESCO Financial institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	EPC Financing

Achievements

To date the Energy Efficiency Milan Covenant of Mayors programme has put in total three calls for tender in the market, of which two have been awarded: the first one, for an investment amount of 13M €, related to 98 buildings in 16 municipalities, the second one concerns an investment of 5,1M € and it included 38 buildings in the Municipality of Milan. The total amount of the investments are around 18M €.

On the first tender the EIB, through Mediocredito Italiano, provided 5M € funding to some members of the ESCO consortium.

The second tender, though already awarded in August 2014, has been put to hold as it has been assigned through a different procurement process.

Some achievement details:

	Beneficiaries Municipalities	Property	Year of award	Investment Million	Energy savings %	Term	Savings used for debt service
EPC1	16	98 public buildings, mainly schools	2012	13,0	35%	15 years	95,0%
EPC3	Municipality of Milan	38 school buildings	2014	5,1	35,5%	15 years	84,5%
				18,1			

Contact details

Province of Milano

Not available

Factsheet

General Info

Country	Italy
Model Name	Energy Efficiency Milan Covenant of Mayors
Date of creation	2009

Model Description

Ownership	Public
Program authority	Province of Milan
Program delivery unit	Dedicated project Implementation Unit
Operating services	Marketer Assessor Aggregator

	Facilitator Financial Advisor
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency (Buildings retrofit)
Beneficiaries	Municipalities in the province of Milan adhering to the Covenant of Mayors initiative
Geographical coverage	Regional 3,84 Million inhabitants

Financial Model Description

Project funding	Private
Project funding vehicle	ESCOs
Financial instruments	EPC Financing
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Unknown
Financial risk	ESCO Financial institutions

Model Requirements

Staff Requirements	Moderate
Equity Requirements	n/a
Funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	18,1M €
Size of project (or project portfolio)	5,1M € to 13,0M €
Level of average energy savings	35%

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Low

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Model 17

ENSAMB

Norway – Sør Østerdal

OWNERSHIP	PUBLIC
Program authority	Regional Council of Sør Østerdal Elverum Engerdal Stor-Elvdal Trysil Åmot Hedmark County Council
Program Delivery unit	ENSAMB (= virtual project team, not a separate legal entity)
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketing Aggregation Facilitation Financial advice Assessment
Type of projects	Energy Efficiency (building retrofits)
Ambition/targets	11,2 million € investment in energy efficiency in buildings to achieve 25% savings, representing 11 GWh/year.
Beneficiaries	Public sector (municipalities)
Funding Vehicle	Property Owners Financial Institutions
Financial Instruments	Equity/Own funds Loans Grants

Summary

ENSAMB (Energy Saving in Municipal Buildings) is a EU financed project through the IEE-program MLEI (mobilising local energy investments). The project started in June 2012 and ended in October 2015.

ENSAMB is a cooperation between a grouping of 5 small municipalities in rural areas of Norway (Elverum, Engerdal, Stor-Elvdal, Trysil and Åmot) that are planning to achieve at least 25% energy savings in all their 133 municipal buildings, representing 11 GWh/year and a foreseen investment of 11,25 M€. The Regional Council for Sør Østerdal organises a part of the energy work in the municipalities, who have also signed the Covenant of Mayors and have a goal of saving up to 25% in municipal buildings in the adopted Energy and Climate Plans.

The Sør Østerdal covers 5 Municipalities, with 35.000 inhabitants. There are 133 municipal buildings covering a surface of 260.000 m², with an energy consumption of 45 GWh/year. Most buildings are from the period 1950 - 80 (when energy costs were very low).

It lays in Hedmark County which is a minority (7%) partner in the project. Secondary schools and some healthcare buildings are managed at the Hedmark County level.

The starting point for the project was the approval of Sustainable Energy Action Plans (SEAP) and the signature of the Covenant of Mayors. With the municipalities having limited resources, the motivation for financial savings dominates.

They are using EPC (Energy Performance Contracts) as a work tool for most measures.

Investments are being bundled into 5 packages:

- EPC for most of the buildings belonging to Elverum Municipality, covering most of the city's municipal buildings
- EPC (similar) for Engerdal, Stor-Elvdal, Trysil and Åmot Municipality
- Conventional (separate contractor based) implementation of measures for buildings belonging to the Hedmark County
- Conventional implementation of measures in the remaining buildings belonging to the municipalities
- Integrated project, i.e. the energy saving part of buildings undergoing a major upgrade

Activities for each bundle include: analysis, preparatory work, inquiry, evaluation, negotiation and contract.

The project also includes training for operating personnel, and documentation for copying and motivation for other similar players/organizations.

Funding for the projects comes from the municipalities and/or banks.

They signed contracts for the first phase (analysis phase) in the EPC for the 4 municipalities Trysil, Engerdal, Åmot and Stor-Elvdal with Norsk Enøk og Energi (NEE). The analysis for the buildings was finished in May 2013. The realization phase started in 2014, and they are now in the beginning of phase 3 (the warranty period).

Some key numbers:

- The contract includes 71 buildings with total area of about 115.000 m²
- Estimated energy savings are about 26 % which represents more than 60.000 €/year (6 million NOK/year)
- The total investment will be approximately 3 million € (30 million NOK)
- The first phase (analysis phase) with NEE has a value of approximately 60.000 € (600.000 NOK)

How does it work?

The methodology that is put into practice covers 3 key tasks:

- Providing technical assistance and technical training
- Modelling inter-municipal cooperation Contracts (EPC)
- Initiate Conventional and Integrated EE investments

The project includes following steps:

- Find out current situation of energy consumption
- Suggest contract strategy for each building
- Bundling into larger packages
- Initiate financing. (Making the measures bankable)
- Initiate investments/actions
- Negotiate, Procurement
- Training of the operational staff
- Documentation, Information and Motivation

Buildings with the same challenges are being bundled (or pooled) for collective purchasing procedures. The categories in the bundling are:

- EPC-contracts
- Conventional purchasing
- Integrated project (Mayor refurbishment with an energy part)

Methodology for EPC

Bundling criteria for EPC's are:

- Time schedule (progress in political processes)
- Volume (optimally between 1-5 M€)

- Willingness to agree on common criteria
 - Calculation interest rate
 - Calculation energy price
 - Selection principles
 - Other contract details

For the EPC projects, they use a negotiated procedure. The process includes an investigation of 2 to 4 pilot buildings, for which the ESCO is asked to provide fixed prices. For the remaining buildings the ESCO is supposed to provide estimated prices.

In the ENSAMB schem, the various phases of an EPC project (from Audit to Approval) typically takes 18 to 27 months, whereas implementation typically takes 1 to 2 years.

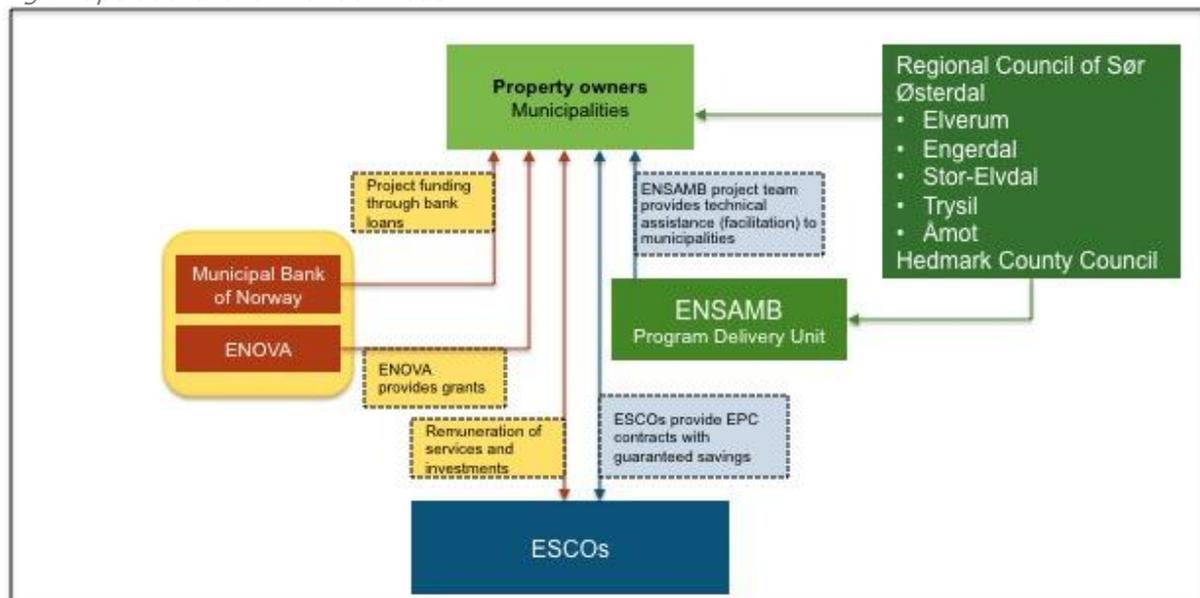
A strong emphasis is put on separate training of the building operators, so that they know about the principles of EPC, the ESCO's obligations and the content of an EPC contract.

The national standardized ESCO contract (Norsk Standard NS 6430:2014) did not exist for this contract (as it was signed early in 2013), but the work is done in close cooperation with the national standardisation authorities. Experience from Sør-Østerdal is reflected in NS 6430.

Financing comes from a mix of sources:

- Municipal Budgets (mostly)
- Some subsidies (ENOVA) (ca. 10%)
- Bank loans in the Municipal Bank of Norway ("green" interest rate 0,1% below nominal)
- Supplier and/or third party (considered not competitive)

Fig 1. Operational and financial model



The program delivery unit

The technical assistance to the municipalities is organized from within the Regional Council from Sør Østerdal.

The EU-program Intelligent Energy Europe covers 75% of the project costs, while Enova (state agency) covers approx. 15%. The rest comes from the partners.

The Program Delivery Unit (PDU) consists in fact of a “virtual” organization made up of 6 project managers from the various stakeholders:

- Municipality of Trysil (leader)
- Municipality of Elverum
- Municipality of Stor-Elvdal
- Municipality of Åmot
- Municipality of Engerdal
- Hedmark County Council

This team is completed with a team of 2 ENSAMB project coordinators from the Regional Council of Sør Østerdal.

Legal structure	Not applicable
Shareholder description	Not applicable
Equity	750 k€ (project funding)
Shareholders	Regional Council of Sør Østerdal and Hedmark County Council
Program dedicated staff	8
Program operational costs	unknown

Organization and partnerships

Not applicable

Beneficiaries

Beneficiaries	Public sector (municipalities)
Type of projects	Energy Efficiency (building retrofits)
Operational support	EPC Projects facilitation through the program delivery unit
Financial support	Facilitation of loans through the Municipal Bank of Norway

	Facilitation of grants through the ENOVA energy agency
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Funding mechanism

Program delivery unit funding	750 k€ grant from the IEE MLEI program
Projects Funding	Projects are funded on municipal budgets, through bank loans (from the Municipal Bank of Norway) and subsidies from the ENOVA energy agency.
Funding Vehicle	Property Owners Financial Institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity/Own funds Loans Grants

Achievements

2 EPC projects were implemented with the following results :

Municipalities	Elverum	Engerdal, Stor-Elvdal, Trysil and Åmot	
Buildings	39	71	
Surface	Ca. 97.000 m2	Ca. 115.000 m2	
Investment	4,3 M€	4,0 M€	6,0 M€
Number of measures	Ca. 300	446	
Energy Savings	23%	26,5%	32,5%
Payback	9 years	6,8 years	9,5 years
NPV (15 years)	2,3 M€	3,1 M€	3,4 M€
Stage	Contract	Bid	Contract

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Factsheet

General Info

Country	Norway
Model Name	ENSAMB
Date of creation	2012

Model Description

Ownership	Public
Program authority	Regional Council of Sør Østerdal Elverum Engerdal Stor-Elvdal Trysil Åmot Hedmark County Council
Program delivery unit	ENSAMB (= virtual project team, not a separate legal entity)
Operating services	Marketing

	Aggregation Facilitation Financial advice Assessment
Implementation model	Energy Performance Contracting (EPC)
Type of projects	Energy Efficiency (building retrofits)
Beneficiaries	Public sector (municipalities)
Geographical coverage	Regional/Local

Financial Mode Description

Project funding	Public Private
Project funding vehicle	Property Owners Financial Institutions
Financial instruments	Equity/Own funds Loans Grants
Repayment model	Guaranteed Savings Agreement

Project risk Profile

Performance risk	ESCO
Recourse	Not applicable
Financial risk	ESCOs

Model Requirements

Staff Requirements	Moderate Less than 10 FTE
Equity or funding requirements	Low Less than 1 million €

Model Key indicators

Investment volume since creation	11,25 million €
Size of project (or project portfolio)	4 - 6 M€
Level of average energy savings	23% – 32,5%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Few examples
Growth of potential	Large
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	High

Sources

<https://ensambprosjekt.wordpress.com/english-summary/>

Alf Kristian Enger, ENSAMB Energy Saving in Municipal Buildings in Small Communities in Rural Districts, April 2015

Regional Council of Sør Østerdal, ENSAMB Energy Saving in Municipal Buildings in Small Communities in Rural Districts,

IEE, Project Fact Sheet Energy Saving in Municipal Buildings in Small Communities in Rural Districts – ENSAMB

Alf Kristian Enger, Energy Saving in Municipal Buildings in Small Communities in Rural Districts, MLEI – ENSAMB, (Regional Project in Sør-Østerdal / Hedmark / Norway), EU SUSTAINABLE ENERGY WEEK, 24-28 June 2013

Alf Kristian Enger, Energy Saving in Municipal Buildings in Small Communities in Rural Districts, ENSAMB, (Regional Project in Sør-Østerdal / Hedmark / Norway), Elverum, 23 October 2012

Alf Kristian Enger, Energy Saving in Municipal Buildings in South Østerdal, (Regional Project in Sør-Østerdal / Hedmark), ManagEnergy – NETCOM, October 2013

Model 18

Brixton Energy Co-op

UK – Brixton

OWNERSHIP	PRIVATE
Program authority	Lambeth Council
Program Delivery unit	Repowering London
Implementation Model	Separate contractor based
Operating Services	Marketing Aggregation Facilitation Financial advice Assessment
Type of projects	Renewable energy Energy Efficiency (building retrofits)
Ambition/targets	Unknown
Beneficiaries	Citizens
Funding Vehicle	Citizens
Financial Instruments	Equity

Summary

Brixton Energy is a not-for-profit cooperative initiative to produce renewable energy through solar PV panels in the South London area of Brixton. It is an example of a so-called REScoop (Renewable Energy Sources COOPERative). The program has allowed the creation of cooperatively owned renewable energy projects, called Brixton Energy Solar 1, Solar 2 and Solar 3. For each of them, a cooperative limited society, owned by the (citizen) investors, is created.

The program itself is run by a not-for-profit organization, called Repowering London, which specializes in facilitating the set-up of the projects.

Citizens finance the projects. Part of the profits of the solar projects are invested in a Community Energy Efficiency Fund (CEEF). The fund is used to improve the energy efficiency of the housing stock in London. The co-operative members together with the community develop the energy saving initiatives in the area. Brixton Energy Solar 1, Solar 2 and Solar 3 demonstrate a best practice in energy savings with their broader social approach. They target via their projects the households who need it the most, e.g. in social housing where energy poverty is a real issue.

For every new project a new share offer is opened to raise sufficient funds. This is open to all British citizens, prioritizing local residents in the case of oversubscription. The community share offers last five weeks, which turns out to be sufficient to raise the money needed.

The expected return on investment is about 3-5%, although it is not the financial benefits that are the most important, but rather the creation of well-being in the community.

The solar projects serve as the means to build a resilient community. Every new project and new REScoop is a "new journey" where new community members are involved in its development. The REScoop raises awareness about energy efficiency and wants to tackle fuel poverty. In addition they provide training and employment for the local people.

The project is not only about renewable energy production or saving of kilowatt-hours. It is also about improving the resilience of a local community. Repowering London wants to create resilience by educating and training young people in the community. Every solar project also offers internships to students, ranging from IT specialist to law students and offers work placements on its renewable energy installation. The aim is to get members of the community involved to learn the trade.

How does it work?

The electricity of the power stations is sold to the grid and partly used on site for communal use at the housing estates. The UK Feed-in Tariff is the principal source of income. This scheme requires electricity suppliers to pay a Generation Tariff of approximately 0,13 £ (0,17 €) per kWh for all the electricity that is generated over a guaranteed period of 20 years. In addition, any surplus that is exported to the grid is eligible for an Export tariff of 0,045 £ - 0,051 £ (0,060 € - 0,065) per kWh. Energy used on site is sold under a separate power purchase agreement (PPA) to the estate at discounted prices.

From every project 20% of the total net profits are set aside for the Community Energy Efficiency Fund (CEEF), which is set up to support energy saving projects and promote energy efficiency. The goal is to make this fund a self-sufficient platform that can exist without government subsidies. The money from the CEEF is used for promotion and installation of relatively low cost energy efficiency measures.

The community members and the co-op members decide which projects (or measures) will be funded. This includes individual home audits, energy surveys, advice sessions and community events. Community members help their neighbours to implement simple changes. This starts with getting a better insight in their own home performance (with an audit), and simple cost saving opportunities such as switching to another cheaper supplier (best prices), draught proofing and changing the lighting.

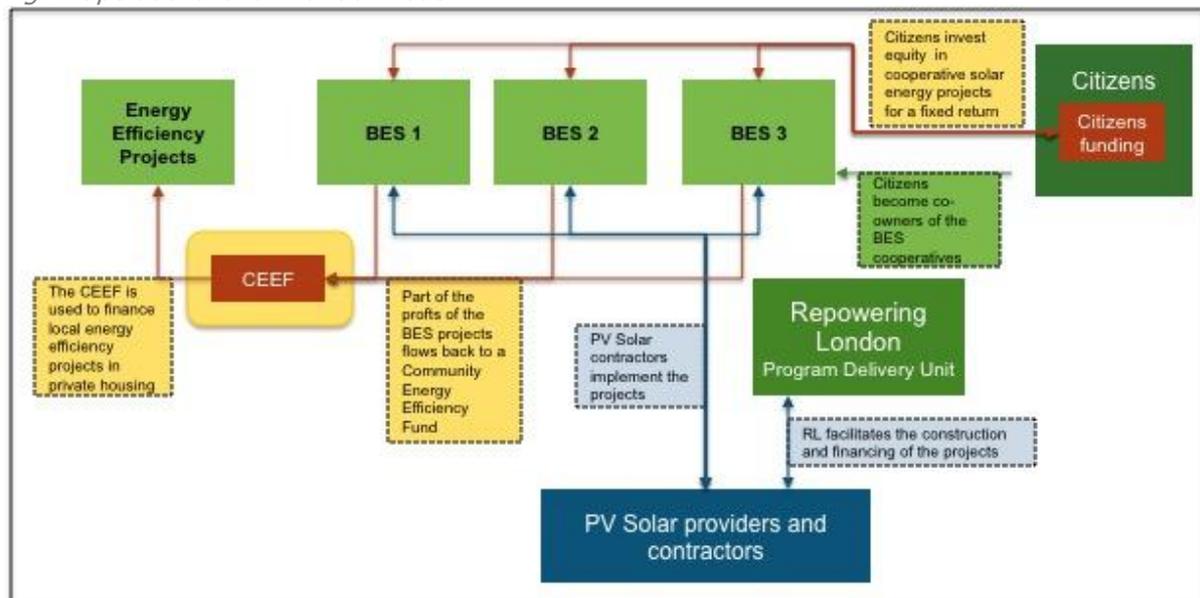
The CEEF is intended to support the delivery of initiatives like:

- The promotion and installation of relatively low-cost energy efficiency measures, such as 'draught-busting'
- Information and guidance about opportunities to install more substantial measures, such as those proposed in the Government's Green Deal
- Local workshops to explore day-to-day practical opportunities and lifestyle changes to reduce energy consumption and costs

The directors are intending to use this fund in order to improve the energy efficiency of the housing stock in Loughborough Estate and Brixton as a whole. The use of the CEEF is determined by the members of the Co-operative and overseen by its directors. Initiatives will be developed with the local residents and community groups such as the Loughborough Tenants and Resident Association and by voting from the full Co-operative members. Projects will be delivered through association and co-production with local residents.

As a co-operative member of Brixton Energy Solar projects, citizens are eligible for tax relief under the Seed Enterprise Investment Scheme. Pursuant to this scheme, qualifying investors can claim a tax relief of 50% of their investment. The relief is given by way of a reduction of tax liability, providing there is sufficient tax liability against which to set it. This tax relief is in addition to the financial return and contribution to the CEEF.

Fig 1. Operational and financial model



The program delivery unit

Repowering London is the program delivery unit and acts as programme marketer, project aggregator, facilitator, project financial advisor and assessor.

Repowering London is a not-for-profit organisation that specialises in facilitating the co-production of community-owned renewable energy projects. Repowering started as a constituted voluntary organisation on September 2011 and registered as an Industrial Provident Society (IPS), more commonly known as a Co-operative since 22 March 2013.

Their service includes the following:

- Essential technical, financial, legal and administrative expertise needed to successfully deliver the projects
- A range of guidance, advisory and project management services
- Access to a network of potential investors, ensuring the necessary financial backing for the community owned renewable energy projects

Initial funds and resources came from local and national government grants such as the Greater London Authority Low carbon zone fund, Department of Energy and Climate Change (DECC), Local Energy Assessment Fund (LEAF), Carbon Energy Saving Program (CESP) and Lambeth Council. Repowering London is also supported by several hundred hours of volunteer time.

They work with 11 employees and volunteers.

Legal structure	Not-for-profit organisation
Shareholder description	Unknown
Equity	Unknown
Shareholders	Unknown
Program dedicated staff	11
Program operational costs	Unknown

Organization and partnerships

Brixton Energy Solar 1, 2 & 3 Co-operatives have been developed in partnership with the following organisations:

Transition Town Brixton: Transition Town Brixton (TTB) a community-based movement with a practical approach to preparing for a low-carbon future. For the last couple of years, TTB have been exploring ways of increasing energy efficiency and using renewable energy in Brixton. Brixton Energy is aligned with the aims of the Transition movement.

The Brixton Pound: The Brixton Pound (£) is money that is anchored to Brixton. It's designed to support Brixton businesses and encourage local trade and production. It's a complementary currency, working alongside (not replacing) pounds sterling, for use by independent local shops and traders.

Lambeth Council: Lambeth Council strives to give people more involvement and control of the services they use and the places where they live by putting council resources in their hands. Brixton Energy Co-operative will see residents generating their own energy and reducing carbon emissions realising Lambeth Council's ambition of moving towards a Cooperative Council.

United Resident Housing: United Resident Housing and Loughborough Estate Management Board have been early champions of Brixton Energy Solar 1. Their support has been instrumental in the development of the project by agreeing to the installation of solar panels on the roofs of the Loughborough Estate.

Southern Solar: Southern Solar are specialists in the design, installation and maintenance of solar thermal and solar electrical systems. Southern Solar believe that renewable energy and energy efficiency have a big role to play in helping the UK to reduce its' dependency on fossil fuels and its' impact on the environment.

Beneficiaries

Beneficiaries	Public sector (municipalities)
Type of projects	Energy Efficiency (building retrofits)
Operational support	EPC Projects facilitation through the program delivery unit
Financial support	Facilitation of loans through the Municipal Bank of Norway Facilitation of grants through the ENOVA energy agency

Funding mechanism

Program delivery unit funding	Initial funds and resources came from local and national government grants such as the Greater London Authority Low carbon zone fund, Department of Energy and Climate Change (DECC), Local Energy Assessment Fund (LEAF), Carbon Energy Saving Program (CESP) and Lambeth Council
Projects Funding	Projects are funded through cooperative citizens funding
Funding Vehicle	Citizens
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Equity

Achievements

3 solar PV projects have been implemented:

- Brixton Energy Solar 1 the UK's first inner-city, co-operatively owned renewable energy project on a social housing estate. The project involved the installation of a 37.24kWp solar power station on the roof of Elmore House on Loughborough Estate in Brixton. The capital cost for the solar photovoltaic (PV) installation was raised through a community share offer. Brixton Energy Solar 1 attracted 103 investors whom mostly live in Lambeth with nine from in and around the Loughborough Estate itself and raised £58,000 in less than a month.
- Brixton Energy Solar 2, saw the installation of 45kW of solar electric (photovoltaic) panels on the roofs of Styles Gardens, five of the housing blocks in the Loughborough Estate, Brixton.

The combined array will save approximately 16 tonnes of CO2 every year by displacing electricity generated by coal and gas power stations. Funding was raised through a

community share offer, with an expected average annual return on investment of 3% and up to 50% tax relief under the Government's Seed Enterprise Investment Scheme.

The Estate is owned by Lambeth Council and managed by the Loughborough Estate Management Board (LEMB). They secured approval from Lambeth Council to install solar panels on the roofs following multiple consultation events with the residents of the estate in June and July 2012. They intend for some of the electricity generated from the solar panels to be used by LEMB directly to power the communal spaces in Styles Gardens. The remainder of electricity generated by the project will be exported to the National Grid.

The electricity exported to the Grid will be used immediately by any household or business that has a need for electricity at the time the electricity is available. For instance, during the summer when the panels are producing their maximum output, the project will be producing the equivalent of enough locally-generated solar power for over 70 households on the estate. Unfortunately, it is not possible to provide a direct supply of electricity from the project to the flats in Styles Garden because they are metered individually. However, they intend that these households should be the first beneficiaries of the social fund generated by income from the project, with initial emphasis on draught-busting, other energy efficiency improvements and education initiatives.

- Using the same community led approach, the solar panels for Brixton Energy Solar 3 have been installed on four buildings within the Roupell Park Estate: Hyperion House, Fairview House, Warnham House and the Community Office. The income from the project will be derived principally from the government's Feed-in Tariff scheme, which is guaranteed for 20 years. Some of the energy generated by the project will be used on site with the remainder energy sold directly back to the grid. After operating costs are deducted, profits resulting from the sale of energy will be used to support local energy efficiency initiatives and provide Co-operative members with an annual return on their investment.
- The combined array for Brixton Energy Solar 3 (52.5kW installed capacity) is expected to save approximately 22 tonnes of CO₂ every year by displacing electricity that would otherwise be generated by coal and gas power stations.

What has been done so far with the Community Energy Efficiency Fund (CEEF) ?

- Work experience: Brixton Energy Solar 1 Co-op provided Kevin Wilson of Nevil House a two-week work placement with Southern Solar on the renewable energy installation.
- Home Energy Audits: Two home energy audits were conducted at Elmore House and Styles Gardens that included installation of energy saving measures such as energy efficient light bulbs and energy saving power down plugs.
- Energy surveys: During the last eight months, the Brixton Energy team has conducted energy surveys on the estate that demonstrated that more than half of those residents spoken to were interested in information on saving money on energy bills and related project activities.
- Energy Advice sessions: Six energy efficiency advice sessions were delivered at the Brixton Customer Centre on Brixton Hill. A total of 132 people were spoken to, of which a significant number were spending more than 10% of their income on space heating and electricity.
- Local leadership: Two members of the Brixton Energy management team are residents of the Loughborough estate and continue to be involved in the decision making and development of the projects.
- Community events: The team delivered a series of events that included draught-proofing workshops, information on energy efficiency and advice on reducing costs on energy bills. These events were held at the Transition Town Brixton shared space events at the Loughborough Centre.

Contact details

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Factsheet

General Info

Country	UK
Model Name	Brixton Energy Co-op
Date of creation	2011

Model Description

Ownership	Private
Program authority	Not applicable
Program delivery unit	Repowering London
Operating services	Marketing Aggregation Facilitation Financial advice Assessment
Implementation model	Separate contractor based
Type of projects	Renewable energy Energy Efficiency (building retrofits)
Beneficiaries	Citizens
Geographical coverage	Local

Financial Mode Description

Project funding	Private
Project funding vehicle	Citizens
Financial instruments	Equity
Repayment model	Not applicable

Project risk Profile

Performance risk	Program owner
Recourse	Assets installed
Financial risk	Citizens

Model Requirements

Staff Requirements	Moderate Less than 10 FTE
Equity or funding requirements	Unknown

Model Key indicators

Investment volume since creation	Ca 210 k£ (270 k€)
Size of project (or project portfolio)	60 k£ – 80 k£ (80 k€ – 105 k€)
Level of average energy savings	Not applicable

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature

Financial development maturity	Mature
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Model Qualification

Level of establishment	Well established
Growth of potential	Moderate
Scalability of the model	Moderate
Replicability of the model	High
Impact on public balance sheet	Low

Sources

<https://brixtonenergy.co.uk>

<http://www.repowering.org.uk>

https://www.youtube.com/watch?v=j4CwDrR_NIE

RESCOOP, Foster social acceptance of RES by stakeholder engagement, Part 2, deliverable 2.3.

Model 19

Bulgarian Energy Efficiency and Renewable Sources Fund - EERSF

Bulgaria

OWNERSHIP	PUBLIC
Program authority	Government of Bulgaria (Ministry of Economy and Energy)
Program Delivery unit	EEE Consortium "Econoler-EnEffect-Elana"
Implementation Model	N/A
Operating Services	Marketer Facilitator Assessor Financier
Projects Financed	Energy Efficiency Renewable Energy Resources
Ambition/targets	To build a sustainable market-based capacity for developing and financing EE projects on commercial terms, demonstrate financial profitability of investments in the EE sector and promote the development of a well-functioning EE market in Bulgaria.
Beneficiaries	Project developers, ESCOs, Project contractors, housing corporations, businesses, public entities e.g. municipalities, local authorities, hospitals and universities, residents
Funding Vehicle	Financial Institutions Investment Funds Project/Property owners ESCOs
Financial Instruments	Loans Equity Guarantees

Summary

The 'Energy Efficiency and Renewable Sources Fund' (EERSF), formerly known as the 'Bulgarian Energy Efficiency Fund' (BEEF), is a revolving energy efficiency fund under the form of an independent legal entity (it operates as a public private partnership) established in 2005. It got initial funding from the Global Environment Fund (GEF) through the World Bank's International Bank of Reconstruction and Development (IBRD), from the Government of Bulgaria, the Government of Austria and from the Bulgarian private sector. It aims at providing revolving project finance and technical assistance for public (municipalities, universities, hospitals) and private sector (businesses and residential) energy efficiency projects in Bulgaria. Since 2011 the Fund also provides funding to demand-side off-grid RES production projects.

The EERSF was part of a broader strategy by the government of Bulgaria to align its policies with EU directives, to enable the necessary institutional development and to reduce the energy intensity of the country which at that time was twice the average value of the European Union and was ranking among the highest in Europe.

Though Bulgaria's low energy efficiency situation, both in terms of consumption and of production, offered huge potential for energy savings in a cost-effective way, estimated to be about 40% for the existing building stock, 30% for the district heating sector and 30% for the industry, there was an almost non-existing or very deficient energy efficiency finance market obstructing the access to commercial financing of energy efficiency investments.

This situation prompted the Bulgarian government to include in its new Energy Efficiency Act (EEA) - adopted by the Bulgarian Parliament in February 2004- the creation of the Bulgaria Energy Efficiency Fund. This dedicated energy efficiency fund had the mission to build a sustainable market-based capacity for developing and financing EE projects on commercial terms, demonstrate financial profitability of investments in the energy efficiency sector and promote the development of a well-functioning energy efficiency market.

With this Fund the Bulgarian Government had also the ambition of reducing greenhouse gas (GHG) emissions and of contributing to its intention of halving the primary energy intensity of the country by 2020 compared to 2005 levels without reliance on continuing public funding. By the end of 2013 its projects expected to have total energy savings of over 95,000 MWH/year and reduced GHG emissions by 75 KT/year.

Though the Fund does not distribute profits and is fully endorsed by the Bulgarian Government it is operated as a commercially oriented public-private finance facility and it serves three major roles: it is a lending institution, a credit guarantee facility and at the same time a technical assistance provider. It provides technical assistance to Bulgarian enterprises, municipalities and residents in developing energy efficiency and RES projects and then provides their financing or co-financing or acts as guarantor towards other financing institutions or commercial lenders.

From 2005 through 2008 EERSF received funding from its grantors and donors of almost 21,9M BGN (Bulgarian Lev) which corresponds to an approximate amount of 11,2M €. Over 70% of that amount has been granted by the Global Environment Fund (GEF). Funds were used to provide first investment capital for EERSF, to cover start-up and operating costs and energy efficiency capacity building until the Fund reached financial self-sufficiency.

The funding has been used to create a revolving fund which by the end of 2014 has contributed 45,8 BGN (23,4 M €) to 170 projects with a total value of over 67,6M BGN (34,6M €). It has gained international recognition for its innovative approach to EE financing and consulting.

How does it work?

EERSF operates as an independent legal entity though manages and allocates its financial resources to energy efficiency projects in line with the Bulgarian National Energy Strategy, the Energy Efficiency Act (EEA), the Energy from Renewable Resources Act (ERSA), current legislation and agreements with the principal donors.

- Four main sources or donors provided capitalisation to the EEFRS during the period 2004 through 2008:
 - Global Environmental Facility (World bank): 15,5M BGN or approximately 8,0M €
 - Government of Bulgaria: 3 million BGN or approximately 1,5M €
 - Government of Austria: approximately 3M BGN or 1,5M €
 - Private donors and contributors: 0,4M BGN or 0,2M €

The initial funds were used to provide investment capital for the Fund, to cover initial setup and operating expenses until the EERSF reached financial self-sufficiency and to partially cover for capacity building expenses such as project development and financial packaging.

In 2013 the Fund has been secured with a 5M € grant from the European Bank for Reconstruction and Development (EBRD) and the Bulgarian Ministry of Economy and Energy to finance further partial credit guarantees for ESCO projects in public buildings and in 2014 another 5M € have been secured from KIDSF (Kozloduy International Decommissioning Support Fund) earmarked to assist municipalities in reducing the energy footprint of public buildings.

- EEFRS' General Donor Assembly, which is represented by the main sources of financing, formulates regulations related to the operation, organisation and management of the Fund, the Fund's assets and overall activity of the Fund. It meets in principle once per two years.
- The Management Board is the managing body of the Fund. It consists of 9 members, 5 elected by the General Donor's Assembly and 4 represented by Bulgarian government

agencies. It is responsible for the overall strategic management of EERSF in compliance with its established objectives and principles of operations. It approves, among other things, the Fund's financing and credit guarantee policy, the Fund's strategy, the criteria for assessment and selection of the projects, the financing of the projects and the contracts related to the credit guarantees. It also elects and releases the Executive Director (leads the Fund manager). The Management Board meets once per month.

- Fund Manager *EEE Consortium*, a Canadian-Bulgarian tri partite consortium comprised of an international EE consulting firm and two local Bulgarian businesses elected through international procurement, is the executive body of the Fund. It is responsible for the entire day-to-day operation of EERSF and for ensuring the successful implementation of the project cycles.
- EERSF supports only projects directly related to:
 - Improved energy efficiency in industrial processes
 - Rehabilitation of buildings in all sectors including industrial, commercial, municipal and residential
 - Improvements to heat sources and distribution systems
 - Rehabilitation of municipal facilities such as street lighting
 - Other energy end-use applications including energy management control systems, power factor correction measures, air compressors and fuel switching
 - demand side off –grid RES small projects and measures
- As a lender, the EERSF provides loans at interest rates of between 4,5% to 9% for up to 5 years. A minimum equity contribution of between 10 and 25% is required from project developers, depending on the proposed financing type i.e.: minimum 10% equity requirement applies to co-financing projects (EERSF and commercial bank lending), the maximum 25% equity requirement applies to projects seeking EERSF-only financing. EERSF focuses on commercially viable projects that use well-proven technologies with maximum payback periods of 5 years, and applicants must undergo detailed energy audits before their projects are considered for funding.
- EERSF provides partial credit guarantees (PCGs) which can cover either 50% (first loss basis after the bank-creditor) or 80% (*pari-passu* basis) of a project's total credit value. Individual guarantees are normally capped at 400K €. The credit guarantees provided by EERSF are recognised as first rate collateral equivalent to bank guarantees.
- The EERSF has also developed two types of portfolio guarantee products:
 - Portfolio guarantee for energy performance contracting: Designed for energy service companies (ESCOs) and derived from Energy Performance Contracting (EPC) this guarantee covers up to 5% of potential delayed payments of the covered portfolio. The guarantee could allow ESCOs to negotiate lower interest rates from commercial lenders.
 - Residential portfolio guarantees: Designed for condominium buildings or a portfolio of condominiums this guarantee covers the first 5% of losses (defaults) within the condominium building or portfolio of condominiums.
- EERSF also offers targeted technical assistance in support of ESCOs in preparing projects and programs for investment and partner financial institution promotion and delivery of energy efficiency projects with a view to stimulate deal flow and uptake of financing offered.
- EEE Consortium and the candidate beneficiaries follow a fixed credit application process including 8 steps:
 - Step 1: Project identification (results of detailed energy audit (DEA) or energy-saving measures implementation proposal)
 - Step 2: Initial project screening
 - Step 3: Completion of the Initial Project Proposal (IPP)
 - Step 4: Submission of IPP and accompanying documents to Fund
 - Step 5: Assistance in project design and completion of related documents
 - Step 6: Project appraisal and creditworthiness assessment
 - Step 7: Formal decision on approval for financing
 - Step 8: Preparation and signing of the contract for financing and disbursement of funds

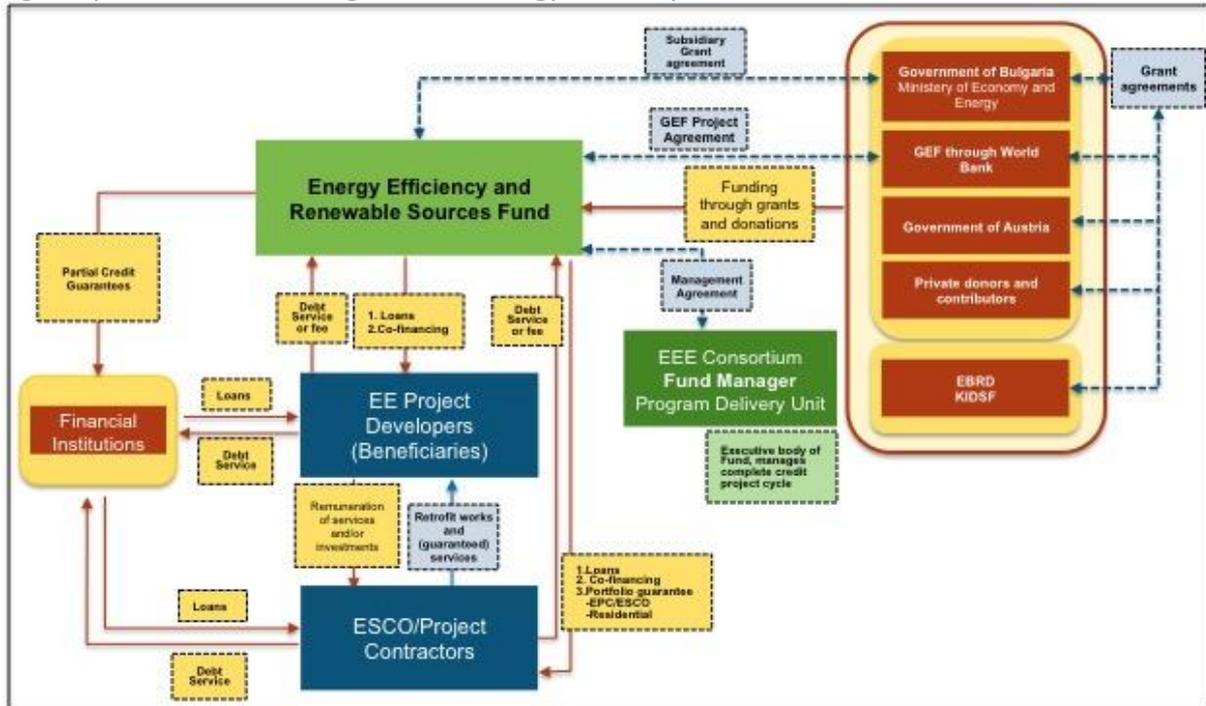
EEFRS proposes credit products at commercial-market interest rates. The fact that it does not distribute profits allows it to be very competitive and offer attractive financing conditions to project developers.

It does apply very low credit fees or not at all, it reimburses administration fees when the credit agreement is signed or when the project is disapproved by EERSF and it does not apply charges for early repayment of the loans. It also lowered its guarantee fees to 0,1% to keep its position in the guarantee market.

At the end of 2014 Municipalities account for 53% of the total loan portfolio in terms of EEFRS funding, 29% were corporates/enterprises and ESCOs and the remainder 19% included mainly universities and hospitals.

The amounts reimbursed by the beneficiaries are being used by EEFRS to fund other energy efficiency projects. Since 2011, all its funds raised through the initial capitalization have been fully invested in projects. As EEFRS is a revolving type fund it has been only relying on revenues from the repayment of the loans.

Fig 1. Operational and funding model of Energy Efficiency and Renewable Sources Fund - EERSF



The program delivery unit

EEE Consortium, in its capacity as Fund Manager of EERSF, is the programme delivery unit of the Bulgarian Government energy efficiency fund programme. It acts as marketer, facilitator, assessor and financier. It operates in accordance with the Fund's investment strategy and its approved regulations. The Fund Manager has been appointed for a period of 5 years.

Its main objective is to operate the Fund as a profit-oriented business in a way that promotes EE investments and helps a sustainable EE market to develop in Bulgaria. The Fund Manager selects, develops and applies the appropriate financing tools based on specific project requirements and overall project portfolio management considerations.

The Fund Manager is led by a full-time Executive Director, proposed by the EEE Consortium and appointed by the Management Board.

The Executive Director manages the day-to-day operations and administration and its main responsibilities and tasks include:

- Representing and serving as the executive body of the Fund.
- Work out the draft-strategy for the Fund's operation;
- selecting and developing commercially viable EE projects and building their financial structures
- developing, managing, and evaluating the product portfolio;
- managing the Fund's financial resources;
- performing the monitoring, reporting, and budgeting functions, and any other required tasks

The Fund management and staff consists of 6 people, i.e. the Executive Director, a Financial and Credit Analyst, a Technical Energy Efficiency Expert, a Technical and Business Plan Expert and 2 administrative staff.

Legal structure	Legal entity
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Low
Program operational	Low

costs	
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Organization and partnerships

Government of Bulgaria through the Ministry of Economy and Energy: program owner and political initiator, initial donor to the capitalisation of EEFRS.

Republic of Austria: initial donor to the capitalisation of EEFRS

Global Environment Facility - GEF: initial and principal donor to the capitalisation of EEFRS through its Implementation Agency IBRD. GEF helps developing countries and countries with economies in transition fund projects and programs that protect the global environment and promote sustainable livelihoods in local communities

Private donors and contributors: private donors of EEFRS. Since 2004 the following donors have contributed to the capitalisation Brunata Bulgaria, Lukoil Bulgaria, DZI Bank (now Eurobank Bulgaria AD), Enemona AD, EVN, Minev & Partners EOOD, Ena Optima EED.

EEE Consortium "Econoler-EnEffect-Elana": Fund Manager of Energy Efficiency Fund EEFRS and acts as the programme delivery unit. Offers the program delivery unit services: marketer, facilitator, assessor and financier.

Energy Efficiency and Renewable Sources Fund - EEFRS: The energy efficiency fund was established in 2005 by the Government of Bulgaria to provide revolving finance, guarantees and technical assistance to public (municipalities, universities, hospitals) and private sector (businesses and residential) energy efficiency projects in Bulgaria.

Kozloduy International Decommissioning Support Fund (KIDSF): Set up with EU funds to support projects related to the decommissioning of four nuclear reactors at Kozloduy power plant as well as to support projects for restructuring and upgrades in Bulgaria's energy sector.

European Bank for Reconstruction and Development (EBRD): Acts as administrator of KIDSF. EBRD fosters transition to market economies, through financial investments, business services and involvement in high-level policy dialogue, in countries from central and eastern Europe to central Asia and the southern and eastern Mediterranean.

International Bank for Reconstruction and Development: - IBRD (World Bank): Is the Implementation Agency of GEF. Provides loans and other assistance primarily to middle income countries. IBRD is the original World Bank institution. It works closely with the rest of the World Bank Group to help developing countries reduce poverty, promote economic growth, and build prosperity.

Local Financial Institutions: provide financing and co-financing to the beneficiaries, to project contractors and to the ESCOs.

Beneficiaries

Beneficiaries	Project developers, ESCOs, Project contractors, housing corporations, businesses, public entities e.g. municipalities, local authorities, hospitals and universities, residents
Type of projects	Energy Efficiency Renewable Energy Sources
Operational support	Technical Assistance to targeted beneficiaries (ESCOs)
Financial support	Technical assistance for free, very low guarantee fees, very low credit fees or not at all, reimbursement of administration fees when credit agreement is signed or when the project is rejected, no charges for early repayment of the loans.

Funding mechanism

Program delivery unit funding	PDU's (Fund Manager) start-up and capacity building has been initially supported by initial donor capitalisation and later by own resources from credits and guarantees granted.
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Projects Funding	Projects are being funded by the beneficiaries' own funds or by their financial institutions, by ESCOs, by project contractors and by EERSF.
Funding Vehicle	Investment Fund Financial Institutions Project/Property owners ESCOs Project contractors
Fund size	Initially 11,2M €, as of 31/12/2014 9,0M€.
Fund type	Revolving fund
Fund sources	Global Environment Fund (GEF), the Government of Bulgaria, the Government of Austria, European Bank for Reconstruction and Development (EBRD), Kozloduy International Decommissioning Support Fund (KIDSF) and from the Bulgarian private sector
Financial Instruments	Loans Guarantees

Achievements

As of 31 December 2014 EERSF has funded or provided guarantees to 170 energy efficiency projects for a total amount of 45,8 BGN (23,4 M €) with a total project investment value of 67,6M BGN (34,6M €).

The 160 projects funded by the EERSF as of 31 December 2013 (compared to 170 projects by 31 December 2014) are estimated to have achieved 95,4K MWh/year energy savings and CO2 reductions of 75K tonnes/year.

As of 31 December 2014 there were 17 active ESCOs with which EERSF had collaboration agreements it has partnership agreements with 4 financial institutions and has general framework agreements for joint operation with 5 other financial institutions.

Despite significant changes in the market environment since 2005, affecting the EERSF program's design and performance, the EERSF has proven to be a successful revolving fund in the energy efficiency market. The Fund has helped develop a new EE market in Bulgaria by identifying the credit demand from municipalities, small and medium enterprises, hospitals and universities.

Project details are shown hereafter:

Type of Beneficiaries	# projects	Share in %	Projects value in million BGN	Share in %	EERSF funded in million BGN	Share in %
Municipalities	98	57,6%	36,9	54,6%	24,2	52,8%
Corporates/Enterprises	53	31,2%	18,6	27,5%	13,1	28,6%
Other (Universities, Hospitals)	19	11,2%	12,1	17,9%	8,5	18,6%
	170		67,6		45,8	

Contact details

Energy Efficiency and Renewable Sources Fund

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Factsheet

General Info

Country	Bulgaria
Model Name	Energy Efficiency and Renewable Sources Fund - EERSF
Date of creation	2005

Model Description

Ownership	Public-Private, majority Public
Program authority	Government of Bulgaria through the Ministry of Economy and Energy
Program delivery unit	EEE Consortium "Econoler-EnEffect-Elana"
Operating services	Marketer Facilitator Assessor Financier
Implementation model	N/A
Types of projects financed	Energy Efficiency Renewable Energy
Beneficiaries	Project developers, ESCOs, Project contractors, housing corporations, businesses, public entities e.g. municipalities, local authorities, hospitals and universities, residents
Geographical coverage	National (7,4M inhabitants)

Financial Mode Description

Project funding	Projects are being funded by the beneficiaries' own funds or by their financial institutions, by ESCOs, by project contractors and by EERSF
Project funding vehicle	Investment Fund Financial Institutions ESCOs Project contractors Property owners Financial institutions
Financial instruments	Loans Guarantees
Repayment model	Partially based on energy savings (sometimes guaranteed savings)

Project risk Profile

Performance risk	Unknown
Recourse	Unknown
Financial risk	Investment Fund Project Owners Financial institutions ESCOs Project contractors

Model Requirements

Staff Requirements	Low About 5 FTE
Equity or funding Requirements	Moderate Less than 5 million €

Model Key indicators

Investment volume since creation	+/- 23,4M €
Size of project (or project	20K € to +740K€

portfolio)	
Level of average energy savings	As of 31/12/2013: 95,4K MWh/year energy savings and CO2 reductions of 75K tonnes/year

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth of potential	Moderate
Scalability of the model	Moderate
Replicability of the model	Moderate
Impact on public balance sheet	Moderate

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SUNShINE

Latvia

OWNERSHIP	PRIVATE
Program authority	Not applicable
Program Delivery unit	LABEEF
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketing Facilitation Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits)
Ambition/targets	Deep retrofit of minimum 200.000 m2 of Multifamily Buildings (ca. 80 buildings) for ca. 30 M€ investments
Beneficiaries	Residential Multifamily Buildings (MFB)
Funding Vehicle	Investment funds
Financial Instruments	EPC financing On bill financing Forfeiting

Summary

The SUNShINE (Save your bUildiNg by SavINg Energy) project is a Horizon2020 funded project running from 1 March 2015 to 1 March 2018. The project builds upon an existing programme that is aimed at the deep retrofit of Multifamily Buildings (MFB) in Latvia.

Under the existing scheme, a private ESCO, called RenEsco, has renovated, over the last 5 years, 15 typical soviet era apartment buildings using Energy Performance Contracting. These buildings are very old, overcrowded and of poor quality. They are typically heated through district heating. The focus of the investment is building envelope, heat distribution pipes, heat control and energy management. Projects are eligible for ERDF (European Regional Development Fund) support of 40% which gives a simple payback time of 9 – 10 years.

RenEsco's business model uses EPC as a tool for renovating the buildings, in combination with on-bill financing (i.e. the homeowner continues to pay the same amount, while the ESCO recovers the amount saved through the House Maintenance Company). EPC contracts are typically signed for 20 years. The homeowners get a modernized apartment, with an increased value by about 20% – 30% right after renovation and an extended life time of the building by 30 years.

Financing to RenEsco was provided by local commercial banks (60%) in combination with a third party guaranteed loan (40%) from the Dutch Housing Institute (guaranteed by the Dutch Housing Corporation) based on project cash flows. No other collateral was foreseen.

Homeowners have an extraordinary payment discipline, with 97% of payments on time and 0% non-payment during the 6 years of existence of the program.

One of the problems of the scheme is the fact that the balance sheet of the ESCO gets charged too much as the amount of projects increases.

This has led to the creation of the SUNShINE project in which a forfeiting fund, called LABEEF (Latvian Building Energy Efficiency Fund), has been created. After having shown the energy savings, typically after 1 to 2 years, this forfeiting fund purchases the future receivables from the ESCO, allowing the ESCO to take on new loans. This forfeiting scheme is key in growing the amount of investment in the buildings.

In addition, one aim of the project is to create an online platform with information on how to renovate a MFB, with several technical, economic and financial tools and with various templates and applications (e.g. contracts, protocols, reporting).

How does it work?

The project uses a combination of an operational scheme based on EPC and a financial scheme using the forfeiting fund.

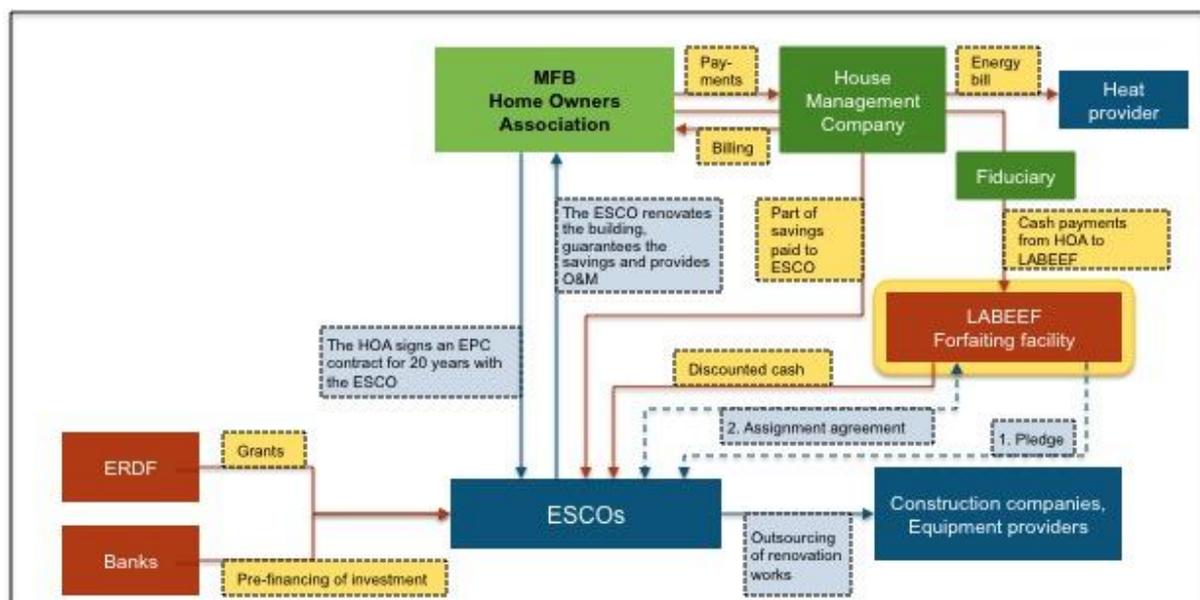
The EPC scheme

- The ESCO signs a 20 year EPC contract with the Home Owner Association (HOA)
- The ESCO takes on a loan from a Financial Institution (FI)
- The ESCO renovates the building to reach typically 45% – 65% savings, while subcontracting to construction companies and equipment providers
- The House Maintenance Company (HMC) bills the same amount as before the renovation works, and pays the ESCO a percentage of those bills, based on the realized savings.
- The HMC pays the lowered energy bill to the heat provider

The forfeiting scheme

- Using the (Multisided) Sharing Platform, the owners and the service company would download the current version of the EPC+ agreement and the Forfeiting agreement. Upon review and approval of the combined documents (quality/comfort standards and savings must be the same), these documents would be signed. Upon meeting these conditions precedent within the required time frame, the funds would be released to the company or its bank.
- Once the project is implemented and the savings are proved, an Assignment agreement is signed. The ESCO receives discounted cash for the future receivables, minus an amount for Operations & Maintenance (O&M) and guarantee.
- The cash flow will then flow from the homeowners, via the HOA, to the Forfeiting facility, which will keep paying the ESCO for high-level O&M. A Fiduciary is in charge of assuring a transparent transaction.

Fig 1. Operational and financial model



The program delivery unit

The scheme essentially involves a financial (forfaiting) fund and ESCOs that work under market conditions. There is no separate program delivery unit.

Legal structure	N/A
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Unknown
Program operational costs	1.555.991 €

Organization and partnerships

The program includes following partners:

- RIGAS TEHNISKA UNIVERSITATE
- EKU SAGLABASANAS UN ENERGETAUIBAS BIROJS
- FUNDING FOR FUTURE BV
- EKODOMA
- SIA SALASPILS SILTUMS
- ECO.NRG SIA
- RenEsco SIA

Beneficiaries

Beneficiaries	Residential Multifamily Buildings (MFB)
Type of projects	Energy Efficiency (building retrofits)
Operational support	Implementation of EPC projects
Financial support	On bill financing of EPC projects, supplemented by a forfaiting facility

Funding mechanism

Program delivery unit funding	Not applicable
Projects Funding	Projects are funded through bank loans, which are then refinanced as discounted cash flows through the forfaiting facility
Funding Vehicle	Investment funds

Fund size	30 M€
Fund type	Public fund
Fund sources	Unknown
Financial Instruments	EPC financing On bill financing Forfaiting

Achievements

The initial program with RenEsco has allowed for the deep renovation of 15 multifamily buildings for a total Capital Expenditure (CAPEX) or investment of 4 M€. Energy savings ranged from 45% to 65%. The simple payback time (including ERDF grants) is typically 9 - 10 years.

Contact details

SUNShINE

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Factsheet

General Info

Country	Latvia
Model Name	SUNShINE
Date of creation	2009 (RenEsco)/2015 (SUNShINE)

Model Description

Ownership	Private
Program authority	Not applicable
Program delivery unit	Not applicable
Operating services	Marketing Facilitation Financial advice Financing Assessment
Implementation model	Energy Performance Contracting (EPC)
Type of projects	Energy Efficiency (building retrofits)
Beneficiaries	Residential Multifamily Buildings (MFB)
Geographical coverage	National

Financial Mode Description

Project funding	Public Private
Project funding vehicle	Investment funds
Financial instruments	EPC financing On bill financing Forfaiting
Repayment model	Guaranteed savings agreement

Project risk Profile

Performance risk	ESCOs
Recourse	Pledged receivables
Financial risk	Investment funds

Model Requirements

Staff Requirements	Not applicable
Equity or funding requirements	Not applicable

Model Key indicators

Investment volume since creation	4 M€
Size of project (or project portfolio)	Unknown
Level of average energy savings	45% - 65%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Start-up

Model Qualification

Level of establishment	Few examples
Growth of potential	High
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	High

Sources

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Model 21

Warm Up North

UK – North East England

OWNERSHIP	PUBLIC-PRIVATE
Program authority	Northumberland County Council Gateshead Council Durham County Council Darlington Borough Council Newcastle City Council South Tyneside Council Sunderland City Council Hartlepool Borough Council Redcar & Cleveland Borough Council
Program Delivery unit	British Gas
Implementation Model	Separate Contractor Based
Operating Services	Marketing Integration Financial advice Assessment
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Ambition/targets	200 M£ (260 M€) investment in up to 50.000 homes. The creation of 75 direct job opportunities regionally and 500 indirect jobs in the local supply chain.
Beneficiaries	Residential buildings Non-domestic public buildings
Funding Vehicle	Property owner (own funds) Financial institutions
Financial Instruments	Loans Grants

Summary

Warm Up North is an energy retrofit program in housing and public non-domestic properties in the North East of England. It addresses both landlords and tenants.

It is a Local Authority partnership who has procured a private sector delivery partner (public-private partnership) to be an exclusively endorsed Green Deal (GD) & Energy Companies Obligation (ECO) Provider. The main contract is between Newcastle City Council and British Gas. Beneficiaries do not need to be British Gas customers to apply. An Inter Authority Agreement exists between Newcastle and the other 8 Authorities:

- Northumberland
- Gateshead
- Durham
- Darlington
- Newcastle
- South Tyneside
- Sunderland
- Hartlepool
- Redcar & Cleveland

The program covers energy efficiency measures e.g. cavity, loft, solid wall insulation, boilers and solar photovoltaic etc.

Warm Up North is committed to delivering 60% of its installations through local small and medium sized companies (SMEs).

The service contract covers a 5 years period from 2013 to 2018 (plus 3 year optional extension) and targets households and non-residential buildings in the North East region who can access works through the contract.

The objectives of Warm Up North are to:

- Improve energy efficiency / reduce energy consumption
- Reduce carbon emissions
- Reduce consumer energy bills / alleviate fuel poverty
- Safeguard / create employment

The investment and financing model is based on a minimum range of 10,000 to 15,000 domestic properties across all tenures to be retrofitted with a mix of measures appropriate to the property / household.

If the scheme is successful it will:

- Help homeowners install energy efficiency measures
- Improve the quality and quantity of energy advice
- Support the regional economy by safeguarding and creating employment and skills
- Help maintain decent neighbourhoods by reducing carbon emissions
- Tackle inequalities by providing residents with mitigating the risk of rising energy costs.

It is the UK's largest regional scheme delivering energy efficiency measures for the residential sector. Procurement is predominantly funded by a European (IEE) grant. British Gas was appointed as exclusively endorsed Green Deal Provider. Green Deal Providers arrange Green Deal Plans, provide finance, and arrange for the installation of the agreed energy efficiency improvements through an authorised Installer. The Green Deal Provider is responsible for:

- Offering a Green Deal Plan to customers, based on recommendations from an accredited Assessor Organisation;
- Arranging for the installation of energy efficiency improvements, carried out by an authorised Installer; and
- Ongoing obligations in relation to Green Deal Plans, including dealing with customer complaints and providing information when a new bill payer moves into a property with a Green Deal.

The Green Deal Plan sets out the financial terms of the agreement and includes consumer protections, such as warranties, to cover the energy efficiency improvements and installation. Only an authorised Provider can offer a Green Deal Plan.

British Gas committed significant levels (albeit reducing) of ECO funding to invest in homes across the partner authorities. In addition they provide programmes of behavioural change, helping consumers to reduce their energy consumption. The EU procurement started in June 2012 and British Gas was selected in July 2013.

The Warm Up North Regional partnership received around 1,24 M £ (1, 6 M€) of DECC (Department of Energy & Climate Change) Grant for Demonstration Projects. Because of the nature of the proposed measures they were able to draw in an additional 750k£ (1M€) 'Energy Company Obligation' (ECO) contributory funding from Energy Companies.

How does it work?

The program uses 2 schemes, Green Deal and Energy Companies Obligation:

Green Deal (GD)

"Green Deal" will provide the new national UK mechanism for improving the energy efficiency of buildings. It is a legislative and regulatory framework being established through the Energy Act 2011 by the UK Government's Department of Energy and Climate Change (DECC), to enable authorised

organisations (Green Deal Providers) to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost. These consumers can recoup repayments through a charge on instalments on the electricity bill, with the Green Deal repayments being collected by UK energy companies on behalf of the Green Deal Provider. A Green Deal Plan can be entered, provided the cost does not exceed the savings; this is known as the "Golden Rule".

- It's a way of paying for the cost of solid wall insulation, boiler replacements and double glazing etc. from the projected savings people make on their energy bills
- Homeowners repay through their electricity bill. So the idea is that their bills (they may save on gas or oil bills, not necessarily electricity) decrease enough to cover the repayments, so total energy bills stay about the same until the loan is paid back
- If the homeowner chooses to get a Green Deal loan, the effective minimum repayment period is 10 years, the maximum 25. The exact length depends on the energy efficiency improvements they choose. Combining improvements can make Green Deal loans more affordable

Since project launch the take up by citizens in the Green Deal 'pay as you save' model has been very weak and UK subsidy levels have been substantially reduced by government. In July 2015 the Green Deal was scrapped.

The Government announced that in light of low take-up and to protect taxpayers from further losses there would be no further funding to the Green Deal Finance Company.

The Government's flagship Green Deal scheme to insulate homes was effectively axed and closed with immediate effect.

Energy Companies Obligation (ECO)

The Energy Act 2011 also imposes new obligations on UK electricity companies, which will support the Green Deal by providing extra support for more expensive improvements to meet the Golden Rule and provide separate, specific help for the lowest income and vulnerable households. This is known as the Energy Company Obligation ("ECO").

ECO creates a legal obligation on energy suppliers to improve the energy efficiency of households through the establishment of originally three distinct targets:

- Hard-to-treat homes and, in particular, measures that cannot be fully funded through the Green Deal. Solid wall insulation and hard-to-treat cavity wall insulation are two examples (standard insulation now included as per amended legislation)
- Provision of standard insulation measures and connections to district heating systems to domestic energy users that live within an area of low income.
- New boilers for low income and vulnerable households to affordably heat their homes.

The following paragraph describes a typical process of any given project, covering an advice visit and assessment, a financial proposal, installation and repayment:

- General marketing and advertising of services and products. Direct marketing to low-income households for boiler replacement.
- No cold calling over the phone allowed within the Contract
- House visits by qualified Surveyor employed by British Gas - assessment made as whether any benefits for energy efficiency measures, recommendations, cost of works and whether they will pay for themselves through reduced energy bills
- Quotation sent from office (cooling period required)
- For private properties the Contract (Green Deal Plan) is between resident and the GD Provider (British Gas) – it sets out the work that will be done and (if GD Loan with GD Finance Company taken out) the repayments
- For socially rented properties the Contract (standard construction) is between Local Authority and British Gas.
- Installations are carried out. For private properties the 'Green Deal' repayments will be automatically added to the electricity bill (which in turn is paid back to the GD Finance Company)

Financing options

There are 2 financing options:

- Consumer Finance: as a credit broker, Warm Up North can arrange a monthly finance agreement with Barclays Partner Finance, meaning customers can choose to spread the cost of their new installation over three to ten years.
 - 9.9% representative annual percentage rate (APR)
 - No upfront deposit required
 - Make additional payments at any time
- Self Funding: customers can pay for their installation in full with major debit and credit cards. Once they agree to an installation, Warm Up North usually takes a 10% deposit. The full amount is only paid once their new installation is complete.

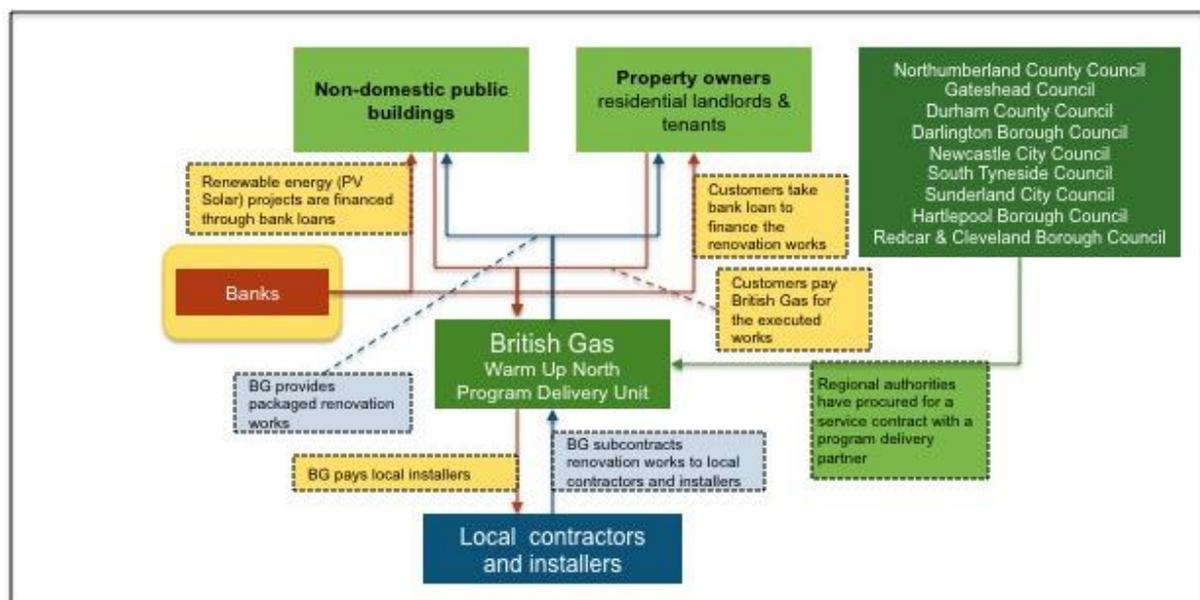
Non-Domestic scheme

In addition to the domestic residential programme, a non-domestic program of PV solar projects on public buildings (leisure centres, colleges, schools) has been developed.

It uses an Energy Performance contracting model. There is no upfront investment necessary, but annual guaranteed savings are used to repay the capital investment. Typical contract term is more than 5 years.

British Gas carries out investment grade audits and provides design, installation and maintenance services.

Fig 1. Operational and financial model



The program delivery unit

British Gas is the program delivery unit for the Warm Up North program. It acts as marketer, integrator, financial advisor and assessor.

The service contract between Warm Up North and British Gas, cover "People services" offered to the end customers and "Physical measures" in the buildings.

British Gas, through its delivery structure, takes the lead on:

- People services
 - Marketing and sign up
 - Building customer confidence
 - Lead on behavioural change
 - Deal with customer services
- Physical Measures
 - Deliver physical improvements/installs
 - Ensure compliance with legislation
 - Ensure high quality work
- As a counterpart, British Gas gets from the Partner Authorities:
 - Endorsement exclusivity
 - Access to Marketing routes at no charge
 - Access to Data to enable clear targeting
 - Awareness raising events / community events
 - Referrals (i.e. customers being directed to them) to Warm Up North

It is unknown how many people at British Gas work on the programme. Also, there is no data available on the costs of the programme.

Legal structure	Unknown
Shareholder description	Private
Equity	Unknown
Shareholders	British Gas
Program dedicated staff	Unknown
Program operational costs	Unknown

Organization and partnerships

Social Housing Providers: Warm Up North provides a business-to-business approach and a tailored package to fully service the housing stock of social housing providers. They can also act as referral partners.

Organizations in the NHS or health sector: They can act as referral partners.

Charity or not for profit organisations: They can act as referral partners.

Beneficiaries

Beneficiaries	Residential buildings (landlords and tenants) Non-domestic public buildings (for PV solar)
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Operational support	Coordination of renovation works
Financial support	Facilitation of financing that is delivered by financial institutions

Funding mechanism

Program delivery unit funding	Unknown
Projects Funding	Unknown
Funding Vehicle	Property owner (own funds) Financial institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Loans Grants

Achievements

- Contract signed with British Gas in July and public launch in Sept 2013
- Offices set up in Newcastle – contact centre
- Staffing ranges between 35 - 45 direct employees to date
- Contracting with local SMEs via British Gas frameworks
- Marketing launched, withdrawn, re-launched, withdrawn, and re-launched!
- 3.600 installations by end December 2015 in more than 3,000 homes
- 24 M€ of works to be contracted by July 2015
- Further more than €35 Million of works expected to be delivered by 2018
- 7k tonnes of CO₂/year saved to date
- For the non-domestic PV solar project, the Warm Up North 'pipeline' is circa. 6 M€ (8 M€), incl. PV installations in social rented houses

Contact details

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Factsheet

General Info

Country	UK
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Model Name	Warm Up North
Date of creation	2012

Model Description

Ownership	Public-Private
Program authority	Northumberland County Council Gateshead Council Durham County Council Darlington Borough Council Newcastle City Council South Tyneside Council Sunderland City Council Hartlepool Borough Council Redcar & Cleveland Borough Council
Program delivery unit	British Gas
Operating services	Marketing Integration Financial advice Assessment
Implementation model	Separate Contractor Based
Type of projects	Energy Efficiency (building retrofits) Renewable energy
Beneficiaries	Residential buildings Non-domestic public buildings
Geographical coverage	Regional

Financial Mode Description

Project funding	Private
Project funding vehicle	Property owner (own funds) Financial institutions
Financial instruments	Loans Grants
Repayment model	Not applicable

Project risk Profile

Performance risk	Property Owner
Recourse	Not applicable
Financial risk	Property Owner

Model Requirements

Staff Requirements	Unknown
Equity or funding requirements	Unknown

Model Key indicators

Investment volume since creation	30 M€
Size of project (or project portfolio)	Unknown
Level of average energy savings	Unknown

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Well established
Growth of potential	High
Scalability of the model	High

Replicability of the model	High
Impact on public balance sheet	Low

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Model 22

SPEE Picardie

France – Picardie Region

OWNERSHIP	PUBLIC-PRIVATE
Program authority	Regional Council of Picardie (Conseil Régional de Picardie)
Program Delivery unit	SPEE Picardie
Implementation Model	Separate Contractor Based
Operating Services	Marketing Integration Financial advice Financing Assessment
Type of projects	Energy Efficiency (building retrofits)
Ambition/targets	Renovate 2000 residential homes over a 3 year period with 50 to 75% energy savings through a 50 Million € investment and the creation of 33 direct jobs and 650 indirect jobs in the construction sector. Over the next 5 years, 10,000 renovations per year, for 300 Million € investment and the creation of 3.500 jobs in the construction sector.
Beneficiaries	Residential buildings
Funding Vehicle	Property owner (own funds) Financial institutions
Financial Instruments	Loans Grants Utility incentives (white certificates)

Summary

The Regional Council of Picardie has decided the creation of a Public Energy Efficiency Service (Service Public de l'Efficacité Energétique or SPEE), which is an integrated service for the energy renovation of residential buildings, which offers advice, accompaniment, and financing of thermal retrofit projects of private homeowners.

This creation must be seen in the light of objectives of the Picardie Region within the boundaries of the Regional Climate Air Energy Scheme 2020 and 2050:

- Massive thermal retrofit of residential homes
- Experiment financing schemes that lift the barrier of advanced payment (i.e. third party financing) and current commercial bank financing logic (i.e. banks are not used to do EE investment, high interest received due to perceived risk, collateral requests...).
- Substantial level of job creation
- Organise the chain of professional contractors to ensure a minimum level of energy performance
- Develop an integrated approach based on the qualification of local contractors
- Lift the barriers of the development of energy renovation projects
 - Mobilise the local offerings of advice and works
 - Propose a thermal audit and advice to households
 - Propose a financing solution
 - Accompany homeowners during and after the works

Several initiatives were taken to stimulate both the demand and the offer for thermal retrofit:

- Creation of an Energy Information Space network with 15 advisors
- Management of contractors by local actors (e.g. Globe 21, MEF of Vermandois,...)

- Regional experiment with zero interest rate loans for energy efficiency and renewable energy investments for residential homeowners (10.000 cases in 4 years)

Other initiatives were taken to stimulate the thermal retrofit market:

- Deployment of the Energy Information Space network towards a more upstream accompaniment of residential homeowners during and after the works: retrofit technicians
- Organisation of thermal retrofit contractors by stimulating grouping of companies
- Assurance of the financing of retrofit works based on long term financial savings

All of this has led to the creation of the SPEE Picardie, that aims to put in place pilot projects over a 3-year period, following 3 major steps:

- Regional deliberation on the creation of the SPEE
- Creation of the regional agency (SPEE)
- Installation of the agency in the different territories

The objective of the SPEE is to achieve thermal retrofit projects with a goal to save 50% to 75% of final energy consumptions, depending on the configurations.

The investments of the thermal retrofits have to generate financial energy savings equal to the reimbursement of the loan over the duration of the investments, without additional subsidies.

How does it work?

The operator of the SPEE assures different services, creating important economies of scale:

Centralized operations:

- Service development and marketing
- Development of the information system
- Administrative management, management control and audits
- Creation and management of IT and internet tools
- Financial engineering
- Regional partnerships and training
- Refinancing management, i.e. creating a revolving structure

Local operations

- Management of customer facing personnel
- Management of local partners (construction contractors, experts)
- Customer contacts and project follow-up

The SPEE incorporates a third party financing offering. The financing capacity of the retrofit works through third party financing is:

- Ratio of gains through savings on the heating bill:
 - 85% to finance the thermal retrofit works
 - 15% for the end customer (without taking in to account any subsidies)

From the residential homeowner's point of view:

- Classical loan today for the retrofit of a home: costs 330 €/month with a reimbursement over an 8 years period
- Monthly contribution in the framework of the SPEE: 120 €/month over a 25 years period
- Systematic access to pre-financing even without availability of additional debt capacity

The SPEE has identified 3 main typologies of works:

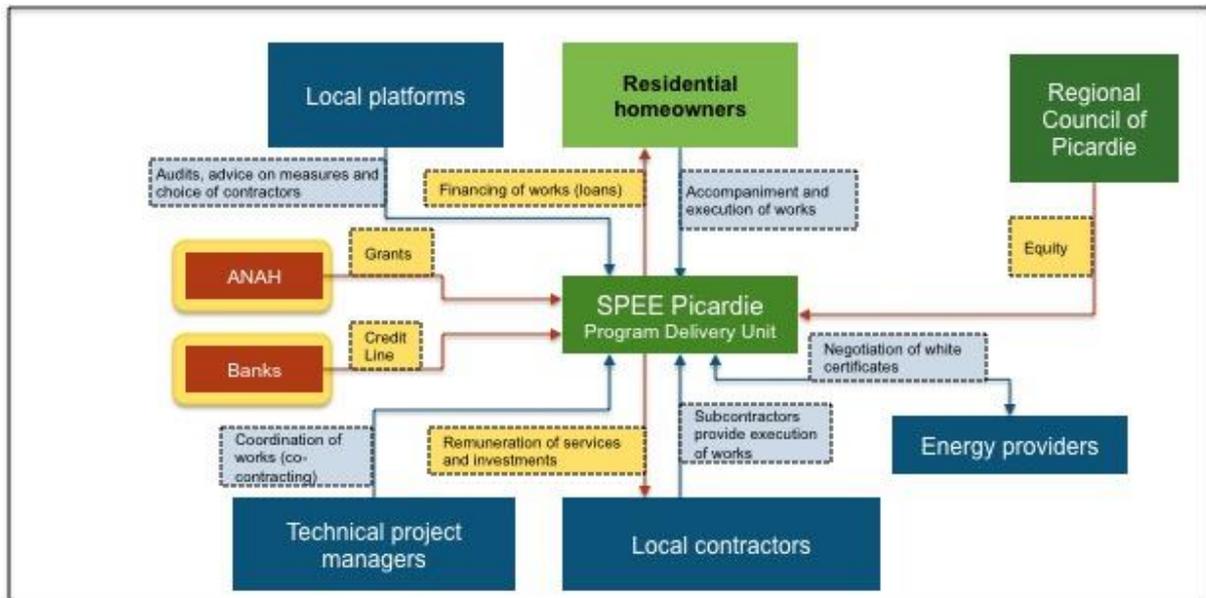
- Scenario 1: Insulation of walls, roofs, floors, double glazing, ventilation
- Scenario 2: Scenario 1 + thicker insulation
- Scenario 3: Scenario 2 + triple glazing on North side + dual flow mechanical ventilation + heat pump

The average cost of the measures is 30.000 € VAT excl. for a home and 15.000 € VAT excl. for an apartment.

In addition to the availability of white certificates, homeowners can benefit from grants from the ANAH (Agence National de l'Habitat).

Associated with the program of the SPEE is a training program for local contractors, called PRAXIBAT, implicating 17 partner schools and technical training centres.

Fig 1. Operational and financial model



The program delivery unit

The management of the SPEE is ensured by the creation of a personalised agency that plays the role of project management assistant towards residential homeowners. The SPEE ensures following services:

- Advice to residential homeowners (realisation of a thermal audit and proposal of measures)
- Assistance to the execution of the works (support in choosing contractors, follow-up of the measures, post-works follow-up)
- Third party financing ensured by the SPEE or by partner financial institutions (long term loan) in accordance with the debt capacity of the homeowner
- Long term accompaniment and maintenance of the equipment

The SPE has streamlined a process along the following steps:

- Receipt of demands by phone, sorting between simple requests for information and real projects
- On site visit
- Complete thermal diagnosis and determination of scenarios of works
- Contractual agreement with the SPEE
- Request for proposals from and choice of contractors
- Implementation of the financial proposal
- Execution of works (with initial and intermediate meetings)
- Reception (i.e. approval) of works
- Post-works visits (1/year during 5 years)
- Management of financial "events" (defaults, mutations...)

The cost for one technician to accompany 90 households is 50.000 €/year, with 45 projects implemented. 6 technicians were put in place in 2015, with an aim of 12 in 2015, 18 in 2016 and 24 in 2017.

The financing need for the operator of the SPEE is 58 M€ for 2000 projects:

- 50 M€ for the works
- 8 M€ for the operations (agency, renovation technicians, pilot sites, first loss guarantee fund)

The hypotheses on the operator's financing needs are:

- 8 M€ initial public regional financing grant
- 42 M€ of debt (European Investment Bank and Caisse des Dépôts et Consignations)
- 3 M€ contribution to Public Service
- 2 M€ technical assistance (EIB ELENA), still running until 2017
- 2 M€ valorisation of white certificates (CEE), up to 9% of the amount of works
- 1 M€ CPER (Contrat de Plan Etat-Région) Picardie/FEDER grant

From an initial model of partial integrator/facilitator in which the SPEE coordinated the work of the contractors (for applying the measures) and local partners (for audits and choice of contractors), because of the difficulty to work with the monopoly of banks on financing, a new model was put in place in which the SPEE plays the role of a full integrator, subcontracting the works to the contractors and local partners.

Legal structure	Public local industrial and commercial entity (Etablissement public local à caractère industriel et commercial (EPIC))
Shareholder description	Public
Equity	8 M€
Shareholders	Regional Council of Picardie
Program dedicated staff	Unknown
Program operational costs	8 M€

Organization and partnerships

Not applicable

Beneficiaries

Beneficiaries	Residential buildings
Type of projects	Energy Efficiency (building retrofits)
Operational support	Full facilitation of renovation works
Financial support	Third party financing and facilitation of financing through banks

Funding mechanism

Program delivery unit funding	8 M€ through public regional grant 2 M€ of technical assistance grant
Projects Funding	42 M€ of debt 2 M€ of white certificates
Funding Vehicle	Property owner (own funds) Financial institutions
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	Loans Grants Utility incentives (white certificates)

Achievements

1000 homes renovated through 25 M€ of investments for 50% to 75% savings.

Contact details

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Factsheet

General Info

Country	France
Model Name	SPEE Picardie
Date of creation	2013

Model Description

Ownership	Public
Program authority	Regional Council of Picardie (Conseil Régional de Picardie)
Program delivery unit	SPEE Picardie
Operating services	Marketing Integration Financial advice Financing Assessment
Implementation model	Separate Contractor Based
Type of projects	Energy Efficiency (building retrofits)
Beneficiaries	Residential buildings
Geographical coverage	Regional

Financial Mode Description

Project funding	Private
Project funding vehicle	Property owner (own funds) Financial institutions
Financial instruments	Loans Grants Utility incentives (white certificates)
Repayment model	Not applicable

Project risk Profile

Performance risk	Property Owner
Recourse	Not applicable
Financial risk	Property Owner

Model Requirements

Staff Requirements	Unknown
Equity or funding requirements	8 M€

Model Key indicators

Investment volume since creation	25 M€
Size of project (or project portfolio)	15 k€ - 30 k€
Level of average energy savings	50% - 75%

Development maturity

Development/implementation stage	Growth
Operational development maturity	Growth
Financial development maturity	Growth

Model Qualification

Level of establishment	Well established
Growth of potential	High
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	High

Sources

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Model 23

KredEx Revolving Fund for energy efficiency in apartment buildings

Estonia

OWNERSHIP	PUBLIC
Program authority	Estonian Ministry of Economic Affairs and Communications
Program Delivery unit	Kredex Foundation
Implementation Model	N/A
Operating Services	Marketer Assessor Financier
Projects Financed	Energy Efficiency Renewable Energy Sources
Ambition/targets	To renovate at least 1000 buildings by the end of 2013 and to target energy savings of at least 20% for buildings with a net area of less than 2000 m ² and at least 30% for buildings with a net area of more than 2000 m ² .
Beneficiaries	Housing associations (apartment associations and building associations) and communities of apartment owners of buildings constructed before 1993 and local authorities (owners of social housing)
Funding Vehicle	Financial Institutions Investment Fund Risk Guarantee Fund Project/Property owners
Financial Instruments	Loans Grants Equity Guarantees

Summary

The 'KredEx Revolving Fund', or 'KredEx Fund', a revolving energy efficiency fund founded in 2009, is part of the KredEx Foundation, a government owned non-profit provider of financial services established in 2001 by the Estonian Ministry of Economic Affairs and Communications (MoEAC). The revolving Fund's funds have been provided by the European Regional Development Fund (ERDF), the Government of Estonia, the Council of Europe Development Bank (CEB) and by the KredEx Foundation.

The KredEx Fund aims at providing revolving project finance, under the "Apartment building renovation loan programme" to multi-family apartment building owners and housing associations in Estonia who wish to improve the energy performance and living conditions of their homes, achieve substantial energy savings and reduce their energy consumption. It also administers grants in the energy efficiency and housing sector on behalf of the Estonian national and local authorities.

The establishment of the KredEx Fund renovation loan scheme in 2009, whose conception goes back to dialogues and collaboration in 2007 between the MoEAC, KredEx Foundation and representatives from KfW Bankengruppe, the German development bank, marked the switch of the Estonian government's energy efficiency support strategy from a focus on a grant-only scheme –such as the one in place from 2003 through 2007- to a more adequate support system based on a combination of loans, loan guarantees and grants. This strategy responded to the Estonian government's wish to align with the EU policies and directives set forth in the EU 2020 climate and energy package as laid down in the following plans and policies:

- the National Housing Development Policy adopted in 2008 with specific objective, among other things, to create a high-quality, energy efficient and sustainable residential building stock
- the Energy Conservation Target Plan for 2007-2013 specifically foreseeing the increase in energy efficiency in residential buildings
- and the National Development Plan for the Energy Sector until 2020.

This new strategy was also in full alignment with the European Commission's wish to have an alternative use of the available ERDF (European Regional Development Fund) funds for sustainable urban development which were before mainly used as a grant instrument by the regions.

Setting up a support system for the renovation of the low quality and low energy efficient apartment buildings was a key measure of the Estonian Government in achieving its energy efficiency objectives. The rationale was to be found in the fact that, at that time, the Estonian building stock accounted for up to 50% of the total national final energy consumption, significantly above the average of 37.5% across all EU countries, that around 60% of the Estonians were living in apartment buildings built primarily between 1961 and 1990 (30% even before 1960) and that energy efficiency and indoor climate were especially in need of improvement.

KredEx Fund's objective is to incentivise apartment building owners to reduce energy consumption and increase the energy efficiency of their homes by at least 20% and to use renewable energy by providing access to preferential loans and grants under certain conditions.

In 2009, its ambition was to renovate at least 1,000 buildings by the end of 2013 and to target energy savings of at least 20% for buildings with a net area of less than 2000 m² and at least 30% for buildings with a net area of more than 2000 m².

Kredex Fund serves basically as a lending institution, through its financial intermediaries Swedbank and SEB, it provides financial products such as preferential loans and loan guarantees (for renovation of apartment buildings).

Through KredEx Foundation it has two additional roles: it acts as an intermediary for reconstruction grants and grants related to efficiency audits, expert evaluation and project design documents and as promotor or marketer of energy efficiency it has put considerable effort in promoting a more efficient use of energy resources and in raising energy efficiency awareness in Estonia.

KredEx Revolving Fund got funding for a total of 72M € to be allocated as renovation loans to multi-family apartment building owners and housing associations. The available grants for renovation are not paid from the KredEx Revolving Fund but from a separate budget coming from the ERDF (€ 3 M) and from the Green Investment Scheme, which is the sale of CO₂ emission allowances by Estonia to Luxembourg and in the European trade market (about 40M €).

As of today the whole funding (72M €) has been exhausted. Notwithstanding its depletion the KredEx Fund is still taking applications in the hope that it can secure new funding. The loan scheme has been successful in promoting the take-up of innovative solutions to improve energy efficiency in buildings often by as much as 40%. The fund has not really yet begun its revolving potential as it is still reimbursing the obtained loans from some of its funders (CEB and Estonian Government).

How does it work?

KredEx Foundation ("KredEx") is a legal person governed by private law and operates independently in the form of a foundation though manages and allocates the dedicated financial resources to energy efficiency projects in building apartments in line with the Estonian government's energy efficiency support strategy and the objectives of the "Apartment building renovation loan programme". It operates by the principles of a credit insurance provider, earning profit from guarantee fees and interest, and investment income from which losses as well as administration expenses are covered. In addition, KredEx provides for the Estonian state the administration service of available grants in the housing area.

Its financial experts worked out the design of the renovation loan scheme (terms, beneficiaries, etc.), ran negotiations with the partners (CEB, ERDF, local commercial banks) and managed the relations

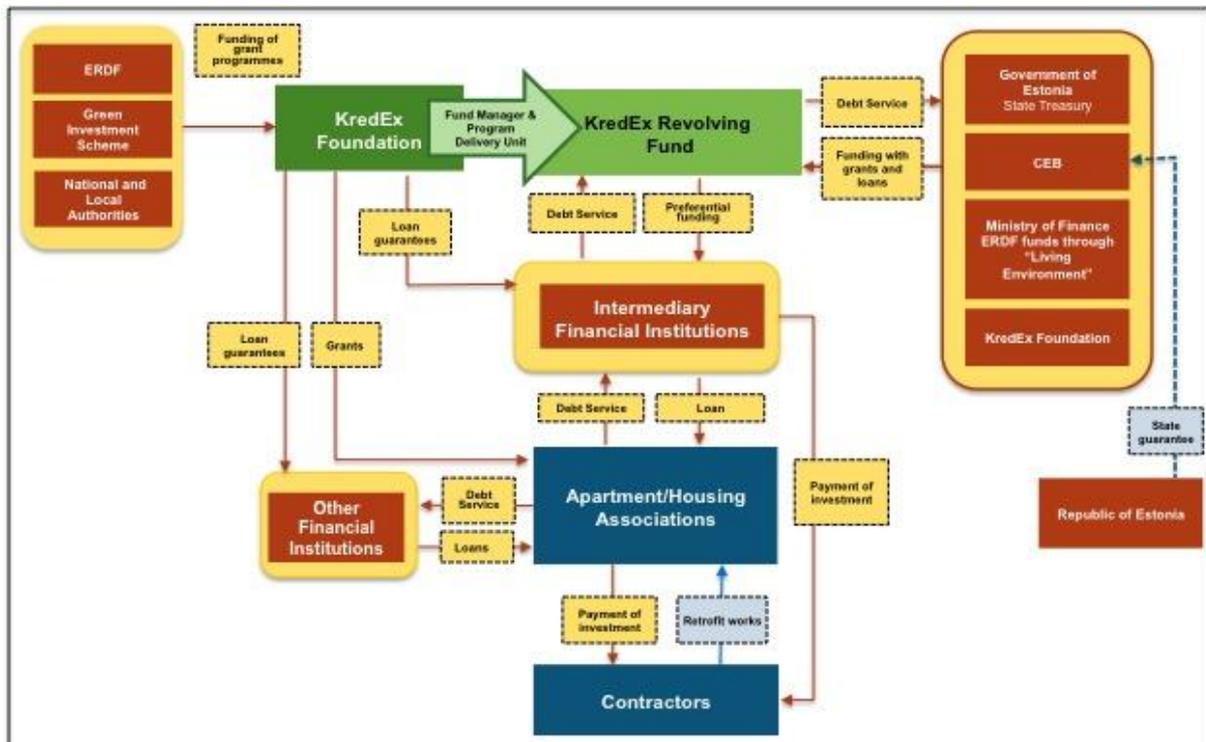
with the beneficiaries of the dedicated Fund (Union of Housing Associations, Builders Associations,...), together with representatives from MoEAC

- Three main sources provided initial funding of about 49M € (766M Estonian Kroon) to the KredEx Fund:
 - Council of Europe Development Bank (CEB), chosen through international bidding: loan of 28,8M €, guaranteed by the Estonian Government
 - European Regional Development Fund (ERDF) through Regional Operational Programme 'Living Environment' (Management Authority Ministry of Finance): grant of 17,0M €
 - KredEx Foundation: 3,2M €
- KredEx Fund has the obligation to pay out all funds received from ERDF to projects by 31 December 2013.
- In May 2013 the revolving Fund secured additional funding of 16,0M € from the Estonian Government (loan) and 7,0M € from Kredex, thus achieving 72,0M € funding.
- The funds have been used to provide soft loans to two intermediary commercial financial institutions, Swedbank (2/3 of the funds) and SEB (1/3 of the funds) chosen through public tendering to administer the renovation loan scheme and to provide further lending to the intended beneficiaries.
- Kredex Foundation has a Council whose main task is to make strategic decisions related to the Foundation's operations and the approval and amendment of documents most important for the operations (budget, strategy, activity goals, risk management, cooperation principles with credit institutions). The council also approves all projects for which the individual total amount of the loan or guarantee issued by KredEx exceeds one million euro. The council consist of maximum 7 members including representatives from MoEAC and the Ministry of Finance.
- The Board is the managing body of the Fund. It is responsible for managing the daily activities of the foundation, ensuring the implementation of the council's decisions and taking responsibility for the fulfilment thereof.
- KredEx Fund supports only renovation and reconstruction projects of multi-apartment buildings where at least three apartment owners want to make use of the loan possibility, preferably represented by a housing association. A minimum commitment of 20% energy savings is required in buildings up to 2000 m², while in larger buildings this increases to 30%.
- As a lender, KredEx Fund has been providing renovation loans at fixed 10-year term interest rates of between 3,5% and 4,5% (the latter interest rate was applied at the beginning), the average being approximately 4,0%, for up to 20 years. For the period 2009 – 2014 the average maturity of the loans is about 17 years. A minimum own contribution of 15% is required from the beneficiaries (this can be own funds, or grants or any other loan) and the maximum amount has been capped to 1,35M € per building. There is no collateral required and the loans are mostly being reimbursed with the achieved energy savings. The building has to be insured during the whole term of the loan. The applied interest rates by KredEx Fund are below commercial-market interest rates and these favourable conditions have been possible because it received (zero cost) grants from ERDF and favourable interest rates from CEB and because, as a not for profit organisation, it does not distribute profits. The KredEx Fund only applies 0,5% to 0,75% of the loan amount as contract fee which is also below commercial market terms.
- Grants are available through KredEx for those housing associations who wish to undertake deep retrofit or reconstruction.
 - Beneficiaries can obtain grants of 15%, 25% or 35% depending on the level of energy savings achieved:
 - For 15% grants the beneficiaries must meet the terms for renovation loan, achieve energy savings of 20% for buildings up to 2000m² or 30% for buildings with a size of more than 2000m², obtain energy label E and limit energy consumption to less than 250 kWh/m²;
 - For 25% grants the beneficiaries need to include roof, facade, windows (U-value 1,1) heating system, achieve energy saving of at least 40%, obtain energy label D and limit energy consumption to less than 200 kWh/m²;
 - For 35% grants the beneficiaries need to include roof, facade, windows (U-value 1,1) heating system, heat-recovery ventilation system, achieve energy

- saving of at least 50%, obtain energy label C and limit energy consumption to less than 150 kWh/m²
 - Beneficiaries can obtain grants up to 50% of the expenses for energy audit and building expert evaluations and project design documents. The purpose of these grants is to motivate representatives of apartment buildings to consult with an expert before planning and performing any reconstruction work, and to have the works carried out in accordance with the expert's suggestions and the Estonian Building Act.
- KredEx provides also apartment building loan guarantees covering up to 75% of the loan amount with no collateral requirement. These guarantees are intended for higher risk rated building apartments (number of debtors, rural area, low market value, payment risk) and when reconstruction cost per m² is higher due to complex reconstruction. Guarantee fee charges of 1,2% - 1,7% apply.
- The loan or grant application process includes basically the following steps:
 - Apartment building associations wishing to undertake retrofit need first to contract an energy audit. Up to 50% of the cost of the energy audit can be financed by grants through KredEx.
 - Based on the energy audit the beneficiary needs to prepare the project design or building design documents (energy audit, energy consumption reports, selected energy efficiency measures, feasibility, required budget, building permit,...). Up to 50% of the building design costs can be financed by grants through KredEx.
 - Request for price quote is being organised by the beneficiary. At least 3 formal price quotes for the works to be carried out are required.
 - Submission of the project and related documents to the intermediary bank and application for loan and/or grants.
 - Project appraisal and creditworthiness assessment by the intermediary banks
 - Formal decision on approval for financing by intermediary banks
 - Forwarding of grant application by intermediaries to KredEx.
 - Formal decision on approval of grants by KredEx
 - Signatory of loan agreement with intermediaries and grant agreement with KredEx
 - The service suppliers (works contractor, project management, supervision,...) are being chosen and contracted by the beneficiary
 - During the works phase the invoices related to the works and the related services are being financed by the bank (funds made available to the beneficiary or paid directly to the service providers).
 - At the end of the works the construction grants (15%- 35%) can be paid out to the beneficiary.

The KredEx Fund's final financing or grants recipients are cooperative housing associations and communities of apartment owners (built before 1993) and local governments (as owner of social housing).

Fig 1. Operational and funding model of KredEx Revolving Fund



The program delivery unit

KredEx Foundation ("KredEx"), in its capacity as Fund Manager of the dedicated KredEx Fund, is the programme delivery unit of the Estonian Government's "Apartment building renovation loan programme". It acts as marketer, assessor and financier. It coordinates the functioning of the revolving fund and operates in accordance with the tasks laid down in the agreement with the Ministry of Economic Affairs and Communications.

It provides regular feedback on the management and performance of the fund and the individual projects progress to the MoEAC..

KredEx also manages the relations with the intermediary banks and the CEB

On a monthly basis KredEx receives specific information from the intermediary banks including information about the building and beneficiaries, description of the investments, the number of dwellings concerned, date of energy audit and possible savings, investment amounts, loan amount and terms and information on additional loans.

KredEx engages into energy efficiency awareness raising activities and public campaigns to promote building renovation and the renovation loan programme. It has organised information days and events, training seminars, and workshops for end beneficiaries, builders, energy auditors, project designers and municipalities and disseminates information through several campaigns in public places and advertisements in different media.

KredEx has two staff dedicated to the programme through its Housing and Energy Efficiency Division, the Department Head and a Project Manager. This division is being assisted by other disciplines and departments of KredEx Foundation, especially by the internal audit unit and financial division who follow up on the implementation of the supported projects.

KredEx has been able to keep the KredEx Fund's running and administrative costs rather low, firstly because nearly all expertise is available in-house and also because a lot of the work during the loan application process is being done by the intermediary banks.

The intermediary banks are indeed taking investment decisions regarding apartment building investment projects and initiatives of final beneficiaries and handle most of the required administrative

formalities of the loan application process up to the drafting and signing of the loan agreement with the final beneficiary.

The KredEx costs related to the setting up of the Fund are estimated to be 200K €, the yearly operational costs are below 100K € and the scheme promotional costs are about 150K € per year.

Legal structure	Legal entity
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Low
Program operational costs	Low

Organization and partnerships

Government of Estonia through the Ministry of Economic Affairs and Communications (MoEAC): program owner and political initiator. Provided funding to the KredEx Fund by means of a loan. Steers the general progress of the loan programme.

KredEx Foundation "KredEx": a government owned non-profit provider of financial services established in 2001 by the Estonian Ministry of Economic Affairs and Communications (MoEAC). Is responsible for coordinating the functioning of the revolving fund and reporting progress to the MoEAC. Acts as the programme delivery unit. Offers the program delivery unit services: marketer assessor and financier.

KredEx Revolving Fund "KredEx Fund" : Is the energy efficiency fund established in 2009 by the Government of Estonia to provide revolving finance to multi-family apartment building owners and housing associations in Estonia who wish to improve the energy performance of their homes, achieve substantial energy savings and reduce their energy consumption

European Regional Development Fund (ERDF): aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. ERDF provided funding in KredEx Fund through funds made available to Management Authority Ministry of Finance and Operational Programme "Living Environment".

Council of Europe Development Bank (CEB): Through the provision of financing and technical expertise for projects with a high social impact in its member states, CEB actively promotes social cohesion and strengthens social integration in Europe. It contributed to the initial funding of the KredEx Fund by means of a loan. Was selected out of several international financial institutions' offers.

Local Commercial Financial Institutions: SwedBank and SEB provide financing to the beneficiaries, take decisions on the projects that will be financed, bear the full financial risk together with the beneficiaries. Have been chosen through a tendering process.

Apartment/Housing Associations: are responsible for obtaining agreement of all flat owners to implement the renovation works and take up a loan. They prepare all required documentation. They commission the energy audit and contract the construction or building companies. They report annually to KredEx on energy savings and to the intermediary banks on the renovation progress during the works phase. They collect loan reimbursements from the flat owners and forward these to the bank.

Beneficiaries

Beneficiaries	Housing associations (apartment associations and building associations) and communities of apartment owners of buildings constructed before 1993 and local authorities (owners of social housing)
Type of projects	Energy Efficiency Renewable Energy Sources

Operational support	No operational support
Financial support	Preferential loans (lower than market interest rates), very low guarantee fees, very low credit fees, longer loan terms

Funding mechanism

Program delivery unit funding	Own resources from guarantee fees, interest and investment income.
Projects Funding	Projects are being funded by the beneficiaries' own funds (at least 15%), by their financial institutions, by KredEx Fund through the intermediary banks and by different grants programmes.
Funding Vehicle	Financial Institutions Investment Fund Risk Guarantee Fund Project/Property owners
Fund size	72M €
Fund type	Revolving fund
Fund sources	Government of Estonia, ERDF, CEB and KredEx Foundation
Financial Instruments	Loans Grants Equity Guarantees

Achievements

As of 31 December 2014 KredEx Fund has exhausted its 72M € funding providing renovation loans for the renovation or reconstruction of 615 apartment buildings with a total programme investment value of almost 103M €. This compares to an initial ambition of financing at least 1000 buildings. Much of the explanation of this shortfall is to be found in the increase of the average loan amount which in 2010, for instance, was about 75K € and has increased over time to an average of 117K € for the whole period 2009-2013.

The average predicted savings achieved with the reconstruction works is about 40%, way above the initial targets of 20 or 30%.

The renovation loans have been mainly used to carry out the following works: insulation of façades (518 cases) and roofs (320 cases) and renovation of the insulation and ventilation (233 cases) and heating systems (327 cases) .

From 2010 through 31 December 2014 reconstruction grants for a total amount of 35,9M € have been paid to support the renovation or reconstruction of 659 apartment buildings, representing some 135M € of total programme investments value.

During the period 2009-2014 loan guarantees of apartment buildings were issued totalling 18,2M €.

As to the grants related to the costs for energy audit, expert evaluations and project design, a total number of 4.014 grants have been paid-out representing 2,1M €.

Despite the fact that the KredEx Fund has not been able yet to leverage on its revolving capacity it has proven to be a successful fund supporting the Estonian Government's objective of improving the energy efficiency and indoor climate in targeted buildings. Through its focused and intense promotional activities it has been instrumental in increasing the energy efficiency awareness in Estonia.

Some programme details are shown hereafter:

Renovation loan programme	
Number of renovated buildings	615
Number of apartments/flats	22.534
Number of inhabitants	51.828

Total net area in m ² of apartment buildings	1.492.824
Total loan amount in million € through KredEx	71,97
Total investment amount in million €	102,74
Average loan in thousand €	117
Expected energy savings	40%

Reconstruction grants issued	
Number of reconstructed buildings	659
<i>Grant type 15%</i>	276
<i>Grant type 25%</i>	182
<i>Grant type 35%</i>	201
Total amount grants paid in million €	35,9
Total amount investment in million €	135

Other grants	Number Paid	Amount (thousand €)
Energy audits	2.442	856
Expert evaluations	210	49
Project design (post energy audit)	1.362	1.210
	4.014	2.115

Contact details

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Factsheet

General Info

Country	Estonia
Model Name	KredEx Revolving Fund for energy efficiency in apartment buildings
Date of creation	2009

Model Description

Ownership	Public
Program authority	Government of Estonia through the Ministry of Economic Affairs and Communications
Program delivery unit	Kredex Foundation
Operating services	Marketer Assessor Financier
Implementation model	N/A
Types of projects financed	Energy Efficiency Renewable Energy Sources
Beneficiaries	Housing associations (apartment associations and building associations) and communities of apartment owners of buildings

	constructed before 1993 and local authorities (owners of social housing)
Geographical coverage	National (1,3M million inhabitants)

Financial Mode Description

Project funding	Projects are being funded by the beneficiaries' own funds or by their financial institutions, by ESCOs, by project contractors and by EERSF
Project funding vehicle	Financial Institutions Investment Fund Risk Guarantee Fund Project/Property owners
Financial instruments	Loans Grants Equity Guarantees
Repayment model	Basically based on energy savings

Project risk Profile

Performance risk	Unknown
Recourse	None
Financial risk	Financial institutions

Model Requirements

Staff Requirements	Low About 2 dedicated FTE
Equity or funding Requirements	Moderate Less than 5 million €

Model Key indicators

Investment volume since creation	72M €
Size of project (or project portfolio)	Unknown
Level of average energy savings	40%

Development maturity

Development/implementation stage	Mature
Operational development maturity	Mature
Financial development maturity	Mature

Model Qualification

Level of establishment	Well established
Growth of potential	Moderate
Scalability of the model	High
Replicability of the model	High
Impact on public balance sheet	Moderate

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Padova's apartment building retrofit programme PadovaFIT!

Padova urban area – Italy

OWNERSHIP	PUBLIC
Program authority	Municipality of Padova
Program Delivery unit	PadovaFIT! Consortium
Implementation Model	Energy Performance Contracting (EPC)
Operating Services	Marketer Assessor Aggregator Facilitator Financial Advisor
Projects Financed	Energy Efficiency (building retrofits) Renewable Energy Resources
Ambition/targets	Investment of 14,8M € in energy efficiency measures
Beneficiaries	Residential apartment buildings and public housing and service facility buildings in the Padova urban area (city of Padova and the municipalities in the area adhering to the project)
Funding Vehicle	ESCOs Financial institutions Investment Fund Risk Guarantee Fund
Financial Instruments	EPC Financing

Summary

PadovaFIT! is a programme initiated by the Municipality of Padova in 2012 aiming at implementing a large scale housing retrofit programme of energy efficiency and renewable energy sources (RES) measures addressing private households -in particular apartment buildings- and, to a smaller extent, public housing and service facility buildings in the Padova urban area (city of Padova and the municipalities in the area adhering to the project). The retrofit programme is based on the principle of Energy Performance Contracting (EPC).

The programme is designed to facilitate and finance energy efficiency retrofits for mainly private apartment buildings in order to improve their energy performance and achieve substantial energy savings. It specifically intends to support these energy efficiency retrofits based on standardised energy conservation measures per type of building, on ESCO financing and on the creation of the role of "apartment building facilitator".

PadovaFIT's purpose was also to contribute to the implementation of the Municipality of Padova's Sustainable Energy Action Plan (SEAP) which was building on previously adopted local energy plans. The SEAP, adopted in 2011 by the Municipality (as a signatory of the Covenant of Mayors since 2009) and approved by the European Union in 2012, crystallised the municipality's commitment to meet the energy reduction targets set out by the Covenant.

Within the framework of its SEAP the municipality was actively pushing local policies to support the implementation of energy efficiency and RES measures to retrofit the public and private building stock. This was most desired as the building stock in the Padova urban area was to a large extent built with no attention to energy consumption, e.g. the low energy efficient apartment buildings were averaging building energy efficiency class G, and many households did not have the financial resources or borrowing capacity or lacked the knowledge to improve the living conditions of their dwellings.

PadovaFIT's approach, based on the municipality's previous experiences with public district heating of its own buildings, is to aggregate apartment buildings, representing rather small and differentiated

investment projects, in order to increase the scale of the project, allowing for energy efficiency and transaction cost optimisation and making the project bankable.

To this end, the Municipality, as coordinator of the programme, has formed a consortium with experienced local private stakeholders, a cooperative bank, an Energy Services Company (ESCO), a higher education non-profit foundation and an engineering company, willing to collaborate and invest in the development of the PadovaFIT! scheme.

This consortium, which is actually the programme delivery unit (PDU), coordinates and facilitates the whole implementation process, it provides technical support to its beneficiaries and plays an active role in the promotion of the programme and in the training of the apartment building facilitators. It acts as marketer, aggregator, facilitator, assessor and financial advisor.

Based on a foreseen investment amount of around 15,8M €, the programme's ambition is to retrofit by the end of the programme in 2016 at least 200 buildings in the private housing sector and achieve average energy savings of 25%. The investment would target about 2250 apartments, decrease CO2 emissions by around 3,7K tonnes/year, save 15,7 GWh/year of primary energy and produce 2,3 GWh/year of renewable energy.

Based on its 15,8M € investment initiative the programme was able to secure 0,59M € funding from Intelligent Energy Europe (IEE) under the initiative "Mobilising Local Energy Investments – Project Development Assistance" (MLEI-PDA) or 75% of the expected programme delivery costs of about 0,8M € for the period June 2013 through May 2016. The investment initiative would be leveraging the grant way above 25.

In October 2015 5 apartment buildings, representing 97 apartments, had formally adhered to the PadovaFIT! programme. Another 44 apartment buildings, representing 900 apartments and 25 businesses, were in the pace of deliberating their adherence to the programme.

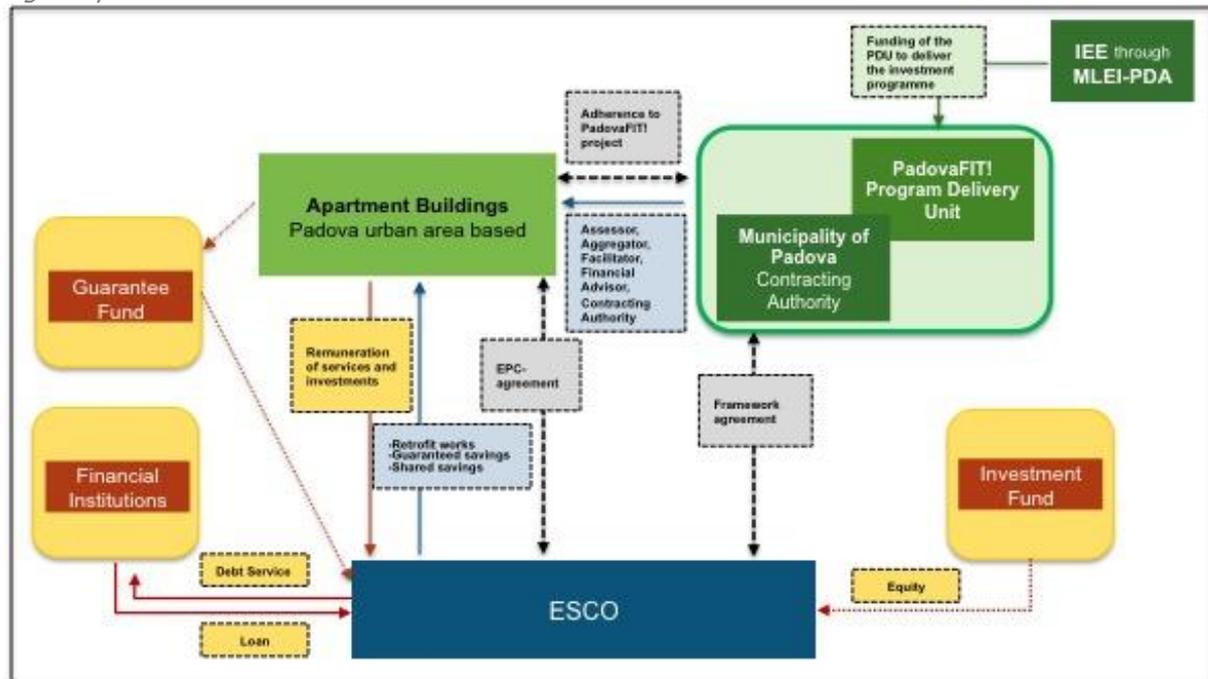
How does it work?

PadovaFIT! retrofitting programme is based on the principle of aggregation of selected apartment buildings and targets the following types of investments: structural refurbishment or renovation of the building envelope, replacement, improvement or insulation of heating equipment, electrical equipment and distribution systems and installation of renewable energy sources.

- After apartment or building owners or building administrators have expressed their interest to the PadovaFIT! programme they are contacted by a representative of the PadovaFIT! Consortium (i.e. the apartment building facilitator) in order to collect preliminary information and to assess if the apartment building has the necessary characteristics for joining the project.
- For apartment buildings matching the criteria a free of charge high level or "light" energy audit will be performed, and if assessed positively for retrofitting it will be followed by a second in-depth energy audit.
- A full retrofit project, including the results of the energy audit, the design of possible energy efficiency measures and their related energy savings, indication of investment amounts, contract periods and pay back is being provided to the candidate beneficiaries (owners and administrators) with the possibility of detailed explanation by the expert of the PDU and the representative of the municipality during a general meeting of the apartment owners. The meeting deliberates the retrofit project proposal and can give its approval to the formal, though not binding, adherence to the project PadovaFIT!.
- Formal adherence, even if not binding, mandates the PDU to include the adhered project into the procurement process of a Delivery Partner, which could be one ESCO or a group of companies including an ESCO. Before starting the procurement process the PDU aggregates the final retrofit projects of the apartment buildings having formally adhered to the project PadovaFIT!.
- Standard public procurement rules apply in the designation of an ESCO and to this end the UDP, through the Municipality of Padova, initiates a tender process for the execution of the aggregated projects works .

- The ESCO that has been awarded the contract in the framework of the tendering process (based on most technically and economically advantageous offer) will need to present and explain in detail its offer to the different meetings of the apartment owners adhered to the project. It is only after formal approval of the ESCO's bid by these meetings that the Energy Performance Contract between the ESCO and the beneficiary can be drafted and eventually signed. An agreement between the ESCO and the Municipality of Padova is also concluded.
- The selected ESCO installs the guaranteed energy efficiency measures (foreseen in the course of 2016), delivers the service and carries out measurement and verification during the agreed contract period (typically 10 years).
- PadovaFIT! has chosen for a project financing structure based on third party financing and more specifically financing by the ESCO. The idea is that the majority of the guaranteed energy savings is being used to the reimbursement of the investment to the ESCO and that a small portion of the energy savings, about 5%, is being kept by the beneficiaries as immediate savings on their energy bills (shared savings). Each apartment owner needs to deposit a guarantee of 150€ to the benefit of the ESCO.
- The ESCO can finance the investments based on its own funds (contractually this has to be at least 20%) or, at its discretion from a financial institution or from a funding structure, an investment fund or participation fund. PadovaFIT! , through Banca Popolare Etica, is currently investigating the establishment of an Investment Fund (or Participation Fund) and a Guarantee Fund.
- PDU is provided to the beneficiaries at no cost as a result of its 0,59M € funding by MLEI-PDA

Fig 1. Operational and financial model



The program delivery unit

A consortium, consisting of the Municipality of Padova and four experienced local private stakeholders is the programme delivery vehicle of the PadovaFIT! energy retrofitting programme. The consortium operates as programme marketer or promotor, assessor, aggregator, facilitator and financial advisor and through the Municipality of Padova as Contracting Authority.

The consortium consists of the following members:

- Municipality of Padova: Programme coordinator. Acts as facilitator and “institutional guarantor” for the aggregation of smaller investment projects.
- Banca Popolare Etica : Is a cooperative bank inspired on the principles of ethical finance. Within the consortium it is responsible for financial engineering and the financing scheme. It has also responsible for investigating the creation of a private Investment Fund and a Guarantee Fund to partially fund the PadovaFIT! investment programme.
- ITS RED Foundation: a higher education non-profit foundation focused on energy efficiency. The foundation facilitates the adherence of the apartment owners to the initiative (facilitator of the decisional process).
- INNESCO S.p.a.: Is a socially and ecologically responsible ESCO. It is responsible for the projects feasibility studies and for the selection of the Delivery Partner/ESCO.
- SOGESCA s.r.l.: Engineering and consulting company. Is responsible for the preliminary technical planning and design of selected buildings and for the GIS (Geographic Information System) database for monitoring.

The PDU manages the implementation process of the programme, from promotion of the programme and analysis and assessment of the projects, over assistance to the general meetings of the apartment owners, to public tendering. It provides legal, technical and administrative support throughout the entire implementation process, including drafting and providing of required documentation related to the tender process, technical support for the implementation of the projects, coordination of the tender process, and assistance and mediation during the contract phase between the ESCO and the beneficiaries. It acts thus as programme marketer, assessor, aggregator, facilitator and financial advisor.

The PDU (through ITS RED Foundation) plays a key role in the training of the apartment building facilitator. It has set-up an 80 hours vocational training course, specifically for building managers and administrators, small owners associations, builders associations, owners or tenants unions, etc.,

aiming at developing diverse competencies in the area of energy efficiency (building law and regulation, energy efficiency measures, energy audit methodology, financial and technical planning) to become facilitator of energy efficiency retrofit processes of private buildings in Padova. From the 24 participants 18 have followed successfully the course.

To assure the working of the PDU a budget of nearly 0,8M€, for the period June 2013 through May 2016, has been made available. Of this funding amount some 75% or 0,59M € has been provided by the IEE under its initiative MLEI-PDA.

Legal structure	None
Shareholder description	N/A
Equity	N/A
Shareholders	N/A
Program dedicated staff	Not available
Program operational costs	Moderate

Organization and partnerships

Municipality of Padova: programme owner and political initiator and project coordinator, drives the programme delivery unit and supports part of the operating costs of the delivery unit.

Apartment Buildings: Are the beneficiaries of the programme if adhered to the PadovaFIT! initiative.

PadovaFIT! Consortium: is the project delivery vehicle of the PadovaFIT! energy efficiency programme. It is a consortium of the Municipality of Padova with the following experienced local private stakeholders: Banca Popolare Etica, INNESCO S.p.a., ITS RED Foundation and Sogesca s.r.l.. It provides staff, procedures, tools and services for the program. It offers program delivery unit services such as marketing and engagement, project assessment, aggregation services, project facilitation and financial advice.

Mobilising Local Energy Investments – Project Development Assistance (MLEI-PDA): Funded under the Intelligent Energy Europe II programme. Addresses local and regional authorities or their groupings to develop projects or packages of sustainable energy projects which are of relevance for the local/regional territorial development and considered to be of 'bankable' scale by financing institutions and/or suitable for grant funding by EU financing schemes such as the cohesion or structural funds.

ITS RED Foundation: Member of the Padovafit! Consortium. Facilitates the adhesion of the apartment/housing/real estate owners to the initiative (facilitator of decisional process)

INNESCO S.p.a.: Member of the Padovafit! Consortium. Feasibility studies and responsibility for selection of Delivery Partner/ESCO. Has performed the preliminary technical and financial engineering.

Sogesca s.r.l.: Member of the Padovafit! Consortium. Responsible for preliminary technical planning and design of selected buildings and GIS database for monitoring.

Banca Popolare Etica S.c.p.a.: Member of the Padovafit! Consortium. Is a cooperative bank inspired on the principles of ethical finance. Responsible for financial engineering and the financing scheme. It has also responsibility for investigating the creation of a private Investment Fund and a Guarantee Fund to partially fund the PadovaFIT! Investment programme.

Apartment Building Facilitators: Building and energy efficiency technical experts appointed by the Municipality of Padova to perform energy audits, convene meetings of the condominium/building owners and participate to the meetings to explain the project and collect the adherences. Have followed successfully the 80 hours training course "Facilitator of Energy Efficiency Retrofit Processes of private buildings/constructions in Padova" (2012).

Investment Fund (*Fondo di Partecipazione*) and Guarantee Fund: To fund and guarantee the bankability of the projects/works. Creation of funds under investigation.

ESCO/Service Delivery Partner: Energy Services Company selected through public tendering. Performs the work planned under the program and guarantee agreed savings to the beneficiaries.

Beneficiaries

Beneficiaries	Residential apartment buildings and public housing and service facility buildings in the Padova urban area (city of Padova and the municipalities in the area adhering to the project)
Type of projects	Energy Efficiency (building retrofits)
Operational support	Project facilitation through the Programme Delivery Unit
Financial support	Project facilitation costs and energy audits free of charge

Funding mechanism

Program delivery unit funding	The dedicated Project Implementation Unit has been funded by MLEI (0,59M €) and by the Consortium members (0,2M €)
Projects Funding	Projects are being funded by the ESCOs
Funding Vehicle	ESCOs Financial institutions Investment Fund Risk Guarantee Fund
Fund size	Not applicable
Fund type	Not applicable
Fund sources	Not applicable
Financial Instruments	EPC Financing

Achievements

PadovaFIT's programme implementation planning is as follows:

- 2013-2015: collecting of adhesions to the project through meetings with stakeholder organisations (building administrators, constructors/building contractors,...), project dissemination and promotional activities, public events, conferences and roadshows and dedicated website
- 2015: tendering and awarding of works to one or more ESCO and drafting of necessary agreements and documents
- 2015-2016: signature of agreements between ESCO and beneficiaries and execution of work

Currently 5 apartment buildings, representing 97 apartments, have formally adhered to the PadovaFIT! programme. Another 44 apartment buildings, representing 900 apartments and 25 businesses, have had an energy audit and are deliberating their adherence to the programme.

PadovaFIT! Is still working on the financing possibilities of the Delivery Partner as the project is too small to readily attract the interest of private investors (private equity or venture capital), and because of the high costs to create a capital fund and the high transaction costs due to involvement of finance consulting. PadovaFIT! Is also exploring possibilities of issuance of bonds or mini bonds.

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Factsheet

General Info

Country	Italy
Model Name	PadovaFIT!
Date of creation	2011

Model Description

Ownership	Public/Private
Program authority	Municipality of Padova
Program delivery unit	PadovaFIT! Consortium
Operating services	Marketer Assessor Aggregator Facilitator Financial Advisor
Implementation model	Energy Performance Contracting (EPC)
Types of projects financed	Energy Efficiency (Buildings retrofit) Renewable Energy Sources
Beneficiaries	Residential apartment buildings and public housing and service facility buildings in the Padova urban area (city of Padova and the municipalities in the area adhering to the project)
Geographical coverage	Local 0,4 M inhabitants

Financial Model Description

Project funding	Private
Project funding vehicle	ESCOs
Financial instruments	EPC Financing
Repayment model	Guaranteed savings agreement Shared savings

Project risk Profile

Performance risk	ESCOs
Recourse	Unknown
Financial risk	ESCO

Model Requirements

Staff Requirements	Moderate
Equity Requirements	n/a
Funding Requirements	Moderate Less than 5M €

Model Key indicators

Investment volume since creation	None
Size of project (or project portfolio)	Not available
Level of average energy savings	25%

Development maturity

Development/implementation stage	Start-up
Operational development maturity	Growth
Financial development maturity	Start-up

Model Qualification

Level of establishment	Well established
Growth potential	Large
Scalability of the model	Moderate

Replicability of the model	High
Impact on public balance sheet	Low

Sources

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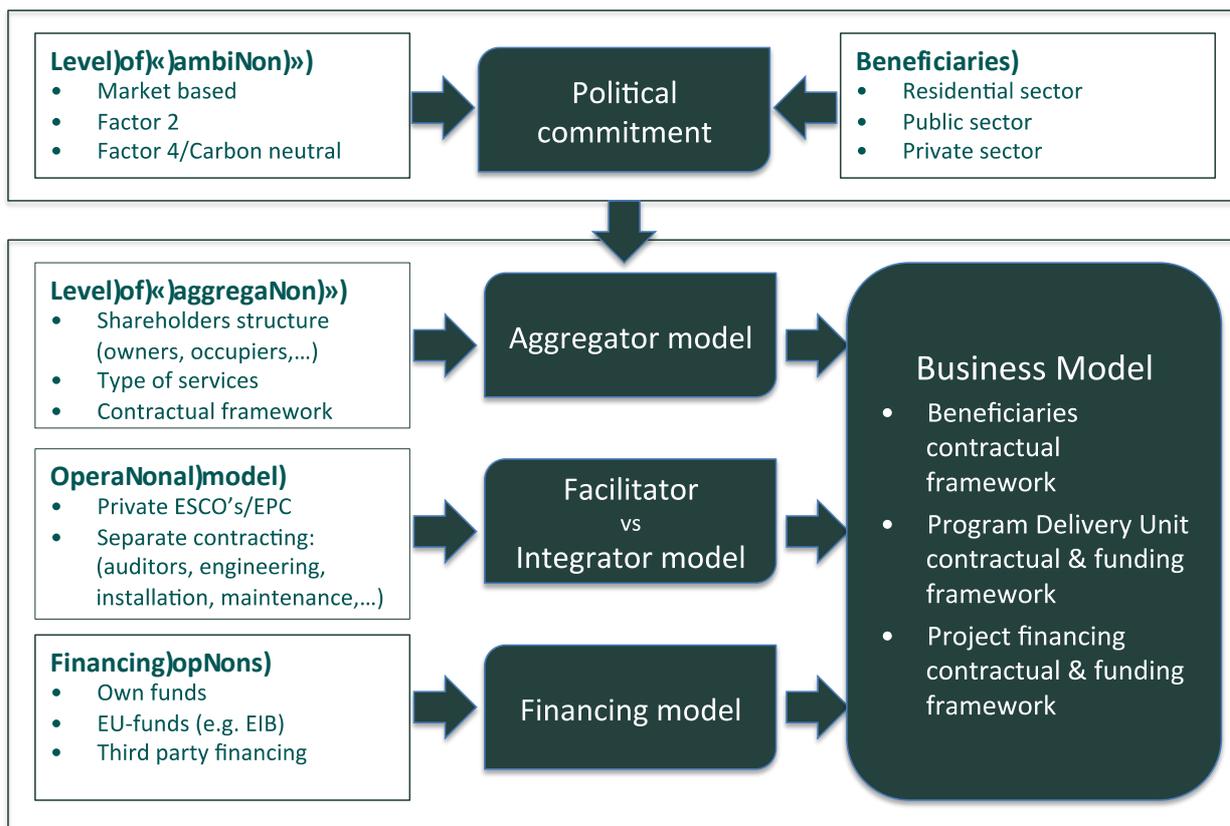
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Section 3 – Strategic planning and action plan



1. Decision mapping



2. Strategic analysis

2.1. Program Authority/Program Delivery Unit roles and functions

The Program Authority (PA) and the Program Delivery Unit (PDU) are the two main stakeholders that will manage and implement the program or the model.

- **Program Authority (PA):** The Program Authority (PA) is the public entity or organization that is in charge of the program or that controls the Program Delivery Unit (PDU). This is typically a national or regional government, a provincial or local authority or council or a city or municipal council. The Program Authority (PA) defines the vision and the program scope including the targeted beneficiaries, the level of ambition, the implementation model and the funding vehicle that is being put in place. The Program Authority also identifies within the stakeholders/parties who can play the role of Program Delivery Unit (PDU), and determines the services that it will offer to the beneficiaries. The Program Authority is also responsible for securing the funding of the Program Delivery Unit (PDU)
- **Program Delivery Unit (PDU):** The Program Delivery Unit (PDU) is the organization that is specifically set-up (and/or entitled) to implement/execute the program. It is often a separate entity, but can also be a department or project team within an existing organization. It can be a public, a public-private or a private entity/organization, depending on the local capabilities and competencies. In the most advanced and complex models, the Program Authority (PA) has set-up a specific legal entity to play the role of Program Delivery Unit (PDU), either as a local public company or as a mixed company (public-private).

Key questions to address

Program Authority (PA)	
Who is/are the Program Authority (PA)?	
How can you help the Program Authority (PA) to	

have a clear vision on the issues?	
How can you support the Program Authority (PA) to define the vision and the program scope?	
How can you get from the Program Authority (PA) a clear commitment to the beneficiaries and the Program Delivery Unit (PDU)?	

Program Delivery Unit (PDU)	
What are the skills and competencies required to manage the Program?	
What are the tools and resources required to manage the Program?	
What will be the staff requirements to manage the Program?	
What will be the funding requirements to deploy the Program?	
How long will the Program run?	
Who are the stakeholders/parties that have the required skills, competencies and resources to play the role of Program Delivery Unit (PA)? Are they willing to play this role?	
Is it desirable/necessary to set up a specific entity to take on the role of Program Delivery Unit (PDU)?	
If a specific entity is to be set up, should it be a public company or a mixed company?	
If a mixed company is suitable, who are the private stakeholders/parties that can be considered? Are they willing to join?	
How will the operating costs of the Program Delivery Unit (PDU) be funded?	
Could the Program Delivery Unit (PDU) apply for a technical assistance grant (e.g. ELENA or EIB technical assistance)?	

Actions to undertake

No	Action	Due	Owner	Status

2.2. Beneficiaries, type of projects & Level of “ambition”

The beneficiary profile, the type of projects and the level of ambition will have a significant impact on the model:

- **Beneficiaries:** They can relate to the public sector, the commercial sector, the residential sector and/or the industrial sector.
- **Type of projects:** These can be Energy Efficiency building retrofit projects, Energy Efficiency public lighting retrofit projects, Energy Efficiency industrial retrofit projects or renewable energy projects.
- **Level of ambition:** the level of ambition can be classified as follows:
 - Up to 35% reduction of energy consumption and/or GHG emissions: this level of ambition could be reached with short and middle term contract durations (average 10 years) based on technical installation (HVAC, lighting, electrical...) retrofits and managed energy services. As basic indicator, the price per square meter in case of a building retrofit could be less than 50€. Typically the ESCO market based offer targets this level of ambition. The market is also able to offer ESCO and TPF financing options for this level of ambition.
 - Up to 50% reduction of energy consumption and/or GHG emissions: this level of ambition could be reached with middle and long term contract durations (between 15 and 25 years) based on technical installations (HVAC, lighting, electrical...) retrofits, envelope retrofits (insulation), near building renewable energy generation and managed energy services. As basic indicator, the price per square meter in case of a building retrofit could be less than 200 €. There are various examples in Europe of EPC/ESC models that have addressed such a level of ambition. ESCO financing and/or TPF financing will be more challenging for this level of ambition.
 - Up to 75% reduction of energy consumption and/or GHG emissions: this level of ambition can only be reached with long or very long term contract durations (min. 25 years) based on deep retrofits. As basic indicator, the price per square meter in case of a building retrofit could range from 800 € to over 1500€. There are a few examples in Europe of EPC/ESC model that have addressed such a level of ambition. This level of ambition requires a mix of financing solutions (conventional financing, ESCO financing, PDU financing, Investment fund).
 - Carbon neutral: this level of ambition can only be reached with combined deep retrofit and renewable energy generation projects. This level of ambition will require a mix of financing solutions (conventional financing, ESCO financing, PDU financing, Investment fund).

Key questions to address

Beneficiaries	Comments
Who will be the beneficiaries of the program?	
How many beneficiaries are there and what is their potential in terms of number and size of	

projects?	
What is the estimated investment need to finance the beneficiaries' projects (depending of the level of ambition)?	
Are the potential and investment needs addressable within the program?	

Type of projects	Comments
What types of projects are addressed?	
What will be the skills and competencies requirements to realize the type of projects addressed?	
Are experienced ESCOs, contractors and/or suppliers available to realize that type of projects?	

Level of ambition	Comments
What will be the level of ambition of the project?	
Is it coherent with the beneficiaries potential and capabilities?	
Are beneficiaries able or willing to contract on a long to very long term?	
Is the level of ambition addressable within the program?	

Actions to undertake

No	Action	Due	Owner	Status

2.3. Implementation model

The implementation model is the method by which the projects are technically and operationally implemented in the field, most often by using contractors or subcontractors. Typical implementation models are Energy Performance Contracting, Energy Supply Contracting and Separate Contractor Based.

- **EPC/ESC model:** Energy Performance Contracting (EPC) or Energy Supply Contracting (ESC) is a method by which an ESCO (Energy Services Company) acts as a unique contractor and assures all the technical and performance risks of the contract. The ESCO offers to the contracting beneficiary performance guarantee on the energy savings (EPC) or "useful" energy for a contractually agreed price (ESC) that secures the stream of savings allowing reimbursing the investment. In the EPC/ESC model, the Program Delivery Unit (PDU) can act either as a project facilitator or project integrator but does not take on the technical risks of the project (neither does the beneficiary). The EPC/ESC model is the key condition to access to ESCO and/or Third party financing (TPF).
- **SCB model:** Separate contracting is a method to implement multi-technique energy efficiency or renewable energy projects, by which each step of the process is dealt with by a separate

party (energy auditor, engineering company, installer or contractor, maintenance company) and by which individual projects (e.g. boiler replacement, relighting, isolation, etc.) are executed by separate contractors for each technique. In this model, the Program Delivery Unit (PDU) can act either as a facilitator or integrator, but it can be useful to have the Program Delivery Unit (PDU) or another organization to act as an integrator to ensure an end-to-end delivery of the energy efficiency program and provide a consistent level of service from the different contractors. In the Separate contracting model, the Program Delivery Unit (PDU) and/or the beneficiary take on the technical risks of the project. In this model, there is also lessroom to access to third party financing (TPF).

Key questions to address

EPC/ESC vs. Separate contracting	Comments
Are there enough local ESCO's on the market to organize competitive tenders? (= Condition for EPC/ESC)	
Do local ESCO market practices meet the program level of ambition (e.g. in case of deep retrofit)? (= Condition for EPC/ESC)	
Are the beneficiaries able or willing to sign long term contracts with suppliers/private ESCO's? (= Condition for EPC/ESC)	
Is there a standard and robust EPC/ESC tendering model available locally? (= Condition for EPC/ESC)	
Are there local expertise and resources available to manage the EPC/ESC tendering process? (= Condition for EPC/ESC)	
Is it desirable to integrate "operating and maintenance services" within the contractual scheme for the projects? (= Suitable for EPC/ESC)	
Is it important/necessary to manage the technical risk of the projects by performance guarantees? (= Suitable for EPC/ESC)	
Is it important/necessary to manage and control transaction costs of the projects? (= Suitable for EPC/ESC)	
Is it important to enhance financial predictability of the projects? (= Suitable for EPC/ESC)	
Are ESCO and/or TPF financing desirable or necessary? (= Suitable for EPC/ESC)	
Are the "time to invest" and "time to savings" decisive factors for the program? (= Suitable for EPC/ESC)	

Actions to undertake

No	Action	Due	Owner	Status
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2.4. Operating Services

The Operating Services are the kind of services that are delivered by the Program Delivery Unit (PDU). They can be Marketing, Aggregation, Integration, Facilitation, Financial Advice, Financing and Assessment (or a combination of):

- **Marketing:** Marketing covers the commercialization and promotion of the services of energy efficiency to the beneficiaries. This covers the whole range of communication and commercial development services that are necessary to inform the beneficiaries of the types of offerings that are available to them. It also covers the pricing policy and product/services development.
- **Aggregation:** see below
- **Facilitation:** Facilitation means that the Program Delivery Unit (PDU) does not sign the contract with the beneficiary, but coordinates or “facilitates” the whole process of project delivery on behalf of the beneficiary. The contracts are signed directly between the beneficiary and the contractors. This role is often played by the Program Delivery Unit (PDU) in case of EPC/ESC implementation model, where the contract is signed directly between the beneficiary and the ESCO. Managing the tendering process is typically part of facilitation services offered in case of EPC or ESC projects.
- **Integration:** Integration means that the Program Delivery Unit (PDU) acts as an intermediary between the beneficiary on one hand and the contractors or subcontractors on the other hand. This means that the contract for the delivery of the energy efficiency is signed between the integrator and the beneficiary and that the integrator signs contracts with the (sub)contractors. This role is often associated with the Separate Contractor Based implementation model, although it can also be applied to EPC or ESC. In the integrating model, the Program Delivery Unit (PDU) takes on the technical and performance risks of the project, except to have back-to-back agreements with the beneficiary on one hand and the ESCO on the other hand (in the case of EPC/ESC model).
- **Financial Advice:** see below
- **Financing:** see below
- **Assessment:** Assessment is the role by which the PDU evaluates the technical and financial viability of an energy efficiency project and decides whether or not the project gets implemented and/or financed. The PDU will typically use a number of criteria to judge whether the project is acceptable or not.

Key questions to address

Marketing	Comments
What are the skills and competencies, resources and staff required to market the program?	
How to market the program?	
What are the funding requirements to market the program?	

Facilitating vs. integrating	Comments
What are the skills and competencies, resources and staff required to facilitate the projects?	
What are the funding requirements to facilitate the	

projects?	
What are the skills and competencies, resources and staff needed to integrate the projects?	
What are the funding requirements to integrate the projects?	
What is the desired level of integration of the program management? (= Suitable for integration)	
Is integration (in particular in case of the separate contracting model) desirable to have a uniform level of service and risk profile to offer? (= Suitable for integration)	
Is there sufficient "added value" to the integration of the contracting process (e.g. single point of contact, risk management, economies of scale)? (= Condition for integration)	
Does the Program Delivery Unit (PDU) have the skills, competencies and resources (in terms of staff and funding requirements) to integrate the program? (= Condition for integration)	
Can the Program Delivery Unit (PDU) take on the "residual" risk? (= Condition for integration)	

Assessment	Comments
What are the skills and competencies, resources and staff required to perform project assessment?	
What should be the assessment indicators and procedures?	
What are the funding requirements for the assessment function?	

Actions to undertake

No	Action	Due	Owner	Status

2.5. Level of "aggregation"

Bundling, pooling, and aggregation of projects and or beneficiaries are common practices in use among the studied models:

- Bundling/pooling: Bundling/pooling means that the beneficiary or the Program Delivery Unit (PDU) bundles/pools the projects in one or more single projects to increase the size of the projects in order to make these feasible and/or to create economies of scale both operationally and financially. This approach could be applied either to the EPC/ESC model as well as to the Separate contracting model (see below).
- Aggregation: Aggregation means that the Program Delivery Unit (PDU) bundles the projects of multiple "internal" customers by acting on behalf of them and by making them available to the

market. The aggregation service can include bundling/pooling of projects. This approach requires that the Program Delivery Unit (PDU) be entitled to act on behalf of the beneficiaries.

Key questions to address

Bundling/pooling	Comments
Is the size of the projects (in terms of energy consumption, energy savings and/or investment potentials) important enough to be self-organized?	
Are there economies of scale through bundling/pooling (e.g. Optimization cost/benefit/risk assessment, legal, procurement process)?	
Are there other "added values" or benefits to bundle/pool the projects (e.g. project consistency, technical rationalization, contractors streamlining)?	
Could the bundling/pooling volume stimulate the market (e.g. more interested suppliers)?	

Aggregation	Comments
Do the beneficiaries have the necessary skills, competencies and resources to organize their projects themselves? Will they take on the aggregating role ? (= Need for an aggregator)	
Have the beneficiaries sufficient and large enough projects to be self-attractive?	
Is it interesting to bundle/pool projects from across different beneficiaries (e.g. schools pools, swimming pools, etc.)?	
Are there economies of scale through aggregation (e.g. Optimization cost/benefit/risk assessment, legal, procurement process)?	
Are there other "added values" or benefits from aggregating projects from across different beneficiaries (e.g. project consistency, technical rationalization, contractors streamlining)?	
Can the Program Delivery Unit (PDU) play the role of aggregator/will it take on that role?	
Are there procurement services/models that allow to be used for multiple beneficiaries (e.g. central purchasing, central command)?	
Are beneficiaries confident with their independence/decision-making power being transferred to the aggregator?	
Can the aggregator volume stimulate the market (e.g. more interested suppliers)?	

Actions to undertake

No	Action	Due	Owner	Status

2.6. Financing & Funding Vehicle

The Funding Vehicle is the entity or structure that is used to finance the projects. Typically, the analysed models/programs make use of the following funding vehicles (or a combination of) :

- **Investment fund:** the Program Authority (PA) or the Program Delivery Unit (PDU) setup a public, public-private, public-citizens fund to provide total or partial project financing of the program. The fund can operate on a stand-alone basis, in cooperation with the Program Delivery Unit (PDU) or be integrated into the Program Delivery Unit (PDU). In this case, the fund takes on the financial risk of the project.
- **PDU financing:** the Program Delivery Unit (PDU) acts as the funding vehicle, providing financing, either through an own funds (or the Investment fund) or by packaging external financing solutions into an integrated financing service. In this case, the Program Delivery Unit (PDU) takes on the financial risk of the project.
- **ESCO financing:** the ESCO or contractor acts as the funding vehicle, providing financing through either EPC financing or ESC financing. In this case, the ESCO takes on the financial risk of the project. The Program Delivery Unit (PDU) can support the beneficiary with financial advice and financial engineering services providing guidance and consultancy on ESCO financing for its project
- **Conventional financing:** the beneficiaries pack internal (own funds) and external financing (financial institutions, utility funds, etc.) solutions in order to finance his projects. In this case, the beneficiaries take on the financial risk of the project. The Program Delivery Unit (PDU) can support the beneficiary with financial advice and financial engineering services providing guidance and consultancy on available funding for the concerned project.

Key questions to address

Main topics	Comments
What is the funding need of the program?	
Are there existing local, regional or national financing instruments to fund the program (e.g. ERDF)?	
Is the program eligible for EU funding (e.g. EIB)?	
Who can bare the financial risk?	
What is the impact on public balance sheet and/or beneficiary balance sheet (debt capacity)?	

Conventional financing	Comments
Are financial advice and financial engineering services provided to the beneficiary sufficient?	
Can beneficiaries provide own funding (own debt capacity)?	
Can the beneficiary take on the financing risk?	
Is bank financing available for the kind of projects included in the program?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) conclude an agreement with financial institutions (public and private) on a structural funding scheme for the program?	
Does the beneficiary need partial credit guarantee or the ESCO portfolio guarantees to finance the projects?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) set up a credit guarantee fund to support the program funding through beneficiaries?	

ESCO Financing	Comments
Do local private ESCO's (market) provide funding?	
Is the ESCO financing competitive compared to conventional (or PDU) financing?	
Can the local private ESCO's market cope with the program size (funding volume)?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) set up an agreement with financial institutions (public and private) on a third party structural funding scheme for the program?	
Does the ESCO need partial credit guarantees or portfolio guarantees?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) set up a credit guarantee fund to support the program funding through ESCO's?	

PDU Financing	Comments
Is it required and/or cheaper to integrate the project financing within the model?	
Can the Program Delivery Unit (PDU) take on the financing risk?	
What is the desired level of integration of the program funding in the role of aggregator/facilitator/integrator?	
Does the Program Delivery Unit (PDU) have the financial expertise and resources to fund the program?	
Can the Program Delivery Unit (PDU) have access to sufficient funding to cope with the program size?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) set up an agreement with financial institutions on a third party structural funding scheme for your program?	

Investment fund	Comments
Is it necessary and/or cheaper to integrate the project financing within the model?	
Is there a need to overcome the financing risk or debt capacity barriers?	
Is there a need to cover credit guarantee or portfolio guarantee?	
Is there an opportunity to leverage the funding size and costs (program maturity)?	
What is the desired level of integration of the program funding in the role of aggregator/facilitator/integrator?	
Can the Program Authority (PA)/Program Delivery Unit (PDU) set up an investment and/or credit guarantee fund to support the program funding?	

Other financing opportunities	Comments
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Are there alternatives available and desirable (e.g. Crowdfunding, citizen funding)	
Can the Program Authority (PA) set up a tax incentive or a tax scheme to attract public and/or private funding?	

Actions to undertake

No	Action	Due	Owner	Status

3. Choices – What is the scope of your programme?

Program scope/ambition	Description
Program authority (PA)	Describe and provide details on the Program Authority
Type of projects	Describe and provide details on the type of projects
Level of ambition	Describe and provide details on the level of ambition
Scope of the program	Describe and provide details on the scope of the program

Beneficiaries	Description
Beneficiaries	Describe and quantify the Beneficiaries

Potential [Investment volume)	Describe and quantify the Beneficiaries investment potential (number, size and funding requirements of projects)
Operational and contractual framework	Describe and provide details on the Beneficiaries operational and contractual framework between Beneficiaries and the Program Delivery Unit (PDU) and/or the Funding Vehicle (in case of Investment Fund)

Program Delivery Unit (PDU)	Description
Program Delivery Unit (PDU)	Describe and provide details on the Program Delivery Unit
Implementation model	Describe and provide details on the Program Delivery Unit implementation model
Operating services	Describe and provide details on the operating services offered by the Program Delivery Unit (including aggregation and financing services)
Operational and contractual framework	Describe and provide detail on the Program Delivery Unit operational and contractual framework: <ul style="list-style-type: none"> * between the Program Authority and the Program Delivery Unit * between the Program Delivery Unit and the Beneficiaries * Between the Program Delivery Unit and the third parties (ESCO, Contractors, suppliers, funding vehicle)
Organisational and skills resources	Describe and provide details on the organisational and skills resources requirements
Staff resources	Describe and quantify the staff resources requirements

Financial resources	Quantify the funding requirements and the funding source

Financing and funding vehicle	Description
Funding needs	Describe and quantify the funding requirements for the program
Funding vehicle(s)	Describe and provide details on the funding vehicle(s) for the program
Operational and contractual framework	Describe and provide details on the Funding vehicle(s) operational and contractual framework: * between the Program Authority and the Funding Vehicle(s) * between the Program Delivery Unit and the Funding Vehicle(s) * Between the Funding Vehicle(s) and the beneficiaries * Between the Funding Vehicle(s) and the third parties (ESCO, Contractors, suppliers)

4. Action plan for implementation

No	Action	Due	Owner	Status

Section 4 – Recommendations and decision Matrix



Recommendations and decision matrix

In order to assist local authorities in determining which of the models might best suit their specific situation and the size of ambition, we have developed a recommendations and decision matrix tool in Excel that guides through questions / answers the project designer to the most appropriate type of model applicable to its situation.

There are 3 areas of recommendations:

- Operational model: Facilitation or Integration
- Aggregation model, as add-on onto the operational model
- Financing model: Own Funds, FI Financing, ESCO Financing, PDU Financing, Investment fund, Citizens Financing

For each area, the user should answer the questions and check the box with the number "1". Multiple answers are possible.

For the Operational model, the model with the majority of checks is likely to be an adequate choice for you. In case the number of checks is equal for both models, you could get more expert advice from a knowledgeable consultant. More information to help you make a choice is also available in the model comparison report.

For the Aggregation model, if the number of checks is equal or superior to 3, it probably makes sense to envisage aggregation.

For the Financing model, the model with the majority of checks is likely to be an adequate choice for you as the primary model. However several models can be used in combination with each other. We do not recommend to use more than 3 models at the same time, unless there are good reasons to do so.

In the following pages, you will find the print screen of the matrix files. The decision matrix tool can be downloaded from our website : www.citynvest.eu.

Recommendations matrix: operational models

Questions	Facilitation		Integration	
	Answers	Check	Answers	Check
What kind of implementation model is envisaged?	EPC/ESC	<input type="checkbox"/>	EPC/ESC	<input type="checkbox"/>
			Seperate Contractor Based	<input type="checkbox"/>
Does the implementation time (time to market) of the model need to be less than a year or can it be more than a year?	More than a year	<input type="checkbox"/>	More than a year.	<input type="checkbox"/>
	Less than a year	<input type="checkbox"/>		<input type="checkbox"/>
Is the creation of a Program Delivery unit as a seperate legal entity a hurdle that is hard to overcome?	Yes. The Program Delivery Unit can be managed by an existing organisation.	<input type="checkbox"/>	No. The Program Authority (PA) will have to consider the creation of a public local company to act as the Program Delivery Unit (PDU).	<input type="checkbox"/>
Who are the beneficiaries of the model?	Public sector	<input type="checkbox"/>	Public sector	<input type="checkbox"/>
	Residential sector	<input type="checkbox"/>	Residential sector	<input type="checkbox"/>
	Commercial sector	<input type="checkbox"/>		<input type="checkbox"/>
	Industrial sector	<input type="checkbox"/>		<input type="checkbox"/>
What is the level of ambition of the model?	Up to 35% reduction of energy consumption	<input type="checkbox"/>	Up to 35% reduction of energy consumption	<input type="checkbox"/>
			Up to 50% reduction of energy consumption	<input type="checkbox"/>
			Up to 75% reduction of energy consumption	<input type="checkbox"/>
			Carbon neutral	<input type="checkbox"/>
Does the model need to be highly scalable or not?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Does the Program Delivery Unit (PDU) need to be off the PA accounting structure on the long term?	Yes, the model can be sized according to the results.	<input type="checkbox"/>	No	<input type="checkbox"/>
Should the model discharge the local authority from risk?	Yes, as the technical risks of the projects are being taken on by the beneficiaries and/or the ESCO/Contractors.	<input type="checkbox"/>	No, as the technical risks are generally being taken on by the PDU.	<input type="checkbox"/>

Number of checks

0

0

Recommendations matrix: aggregation model

Questions	Aggregation	
	Answers	Check
Are project investment amounts too small to be handled separately?	Yes	<input type="checkbox"/>
Are relative transaction costs too high for projects to be handled separately?	Yes	<input type="checkbox"/>
Is the number of projects too high to be handled individually?	Yes	<input type="checkbox"/>
Is there a risk that less bankable projects (e.g. perception of high risk) do not get financed?	Yes	<input type="checkbox"/>
Is there an opportunity to bundle projects according to their typology?	Yes	<input type="checkbox"/>
Is there a risk that the size of projects are below the threshold that third parties are willing to finance on a case-by-case basis?	Yes	<input type="checkbox"/>

Number of checks

0

Recommendations matrix: Financing models

Questions	Own Funds		FI Financing		ESCO Financing		PDU Financing		Investment fund		Citizens Financing	
	Answers	Check	Answers	Check	Answers	Check	Answers	Check	Answers	Check	Answers	Check
Is the beneficiary willing to fund the investment entirely from its own funds?	Yes. There is no other party involved in the financing	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties or by the ESCO.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties or by the ESCO.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties or by the ESCO.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties or by the ESCO.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties or by the ESCO.	<input type="checkbox"/>
Is the ESCO market able or willing to provide the funding for the investment ?		<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties.	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties.	<input type="checkbox"/>
Is there a political will and/or community request to set-up a structure to allow (non-property owner) citizens to invest?		<input type="checkbox"/>	No. The investment needs to be partially or fully by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully by third parties (non-citizens)	<input type="checkbox"/>
Is there a strong requirement for the PDU to deliver a one-stop-shop solution including financing?		<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>
Does limited on non-existing investment capacity of the beneficiaries require the PDU to provide its own financing solutions?		<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>	No. The investment needs to be partially or fully funded by third parties (non-citizens)	<input type="checkbox"/>
Is limited on non-existing investment capacity of the beneficiaries a trigger for the PDU to set-up a dedicated investment fund?		<input type="checkbox"/>	No. The Financial Institutes should provide full or partial financing	<input type="checkbox"/>	No. The Financial Institutes should provide full or partial financing	<input type="checkbox"/>	Yes. The PDU should consider providing financing	<input type="checkbox"/>	Yes. The PDU should consider providing financing	<input type="checkbox"/>	Yes. The PDU should consider providing financing	<input type="checkbox"/>
Do financial market failures (e.g.failure to provide adequate financing, restricted or no access to long term project finance, high risk perception etc.) exist and require the PDU to provide its own financing solutions?		<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or Investment Fund	<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or Investment Fund	<input type="checkbox"/>	Yes. The PDU should consider providing financing	<input type="checkbox"/>	Yes. The PDU should consider providing financing	<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or Investment Fund	<input type="checkbox"/>
Do financial market failures (e.g.failure to provide adequate financing, restricted or no access to long term project finance, high risk perception etc.) exist and require the PDU to provide its own financing solutions?		<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or by PDU Financing	<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or by PDU Financing	<input type="checkbox"/>	No. Financing needs to be provided by a Financial Institution or by PDU Financing	<input type="checkbox"/>	Yes. The Investment Fund provides full or partial financing or guarantees.	<input type="checkbox"/>	Yes. The Investment Fund provides full or partial financing or guarantees.	<input type="checkbox"/>
Is there a need to create leverage (e.g. by attracting third party financing and capital) to increase the investment volume?		<input type="checkbox"/>	No. All other funding options are available.	<input type="checkbox"/>	No. All other funding options are available.	<input type="checkbox"/>	No. All other funding options are available.	<input type="checkbox"/>	Yes. The PDU should consider creating its own investment fund	<input type="checkbox"/>	No. All other funding options are available.	<input type="checkbox"/>

Number of checks

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Section 5 – Glossary



5.1. Model definitions

Program Authority	The program authority is the public entity or organization that is in charge of the program or that controls the program delivery unit. This is typically a national or regional government, a provincial or local authority or council or a city or municipal council.
Program Delivery Unit	The Program Delivery Unit (PDU) is the organization that is specifically set-up to execute or facilitate the program or project. It is often a separate legal entity, but can also be a department or project team within an existing organization.
Implementation Model	The implementation model is the method by which the projects are technically and operationally implemented in the field, most often by using contractors or subcontractors. Typical implementation models are Energy Performance Contracting, Energy Supply Contracting and Separate Contractor Based.
Energy Performance Contracting	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. Other aspects like maintenance can also be integrated and potentially be performance based. Performance guarantees are associated with a bonus and penalty scheme. Measurement and verification and Monitoring are key features of successful EPC contracts. EPC contracts can include financing schemes in which the ESCO acts as third party investor, but EPC contracts can also be financed by the building owner with own funds or through a bank loan.
Energy Supply Contracting	Energy Supply Contracting is method to implement local energy production projects, by which an ESCO (Energy Services Company) acts as unique contractor and by which « useful » energy (e.g. heat, cold, steam, electricity) is delivered to the customer at a contractually agreed price per kWh. The ESCO is in charge of dimensioning, engineering, installing and maintaining the local production installation (e.g. boiler, combined heat & power, photovoltaic solar panels) for the duration of the contract. He typically manages the production efficiency of the installation to optimize the cost of transformation of the fuel into useful energy. The price for the useful energy delivered typically includes a fixed component to cover for the investment of the installation and a variable component to cover for the fuel usage.
Separate Contractor Based	This is a method to implement multi-technique energy efficiency projects, by which each step of the process is dealt with by a separate party (energy auditor, engineering company, installer or contractor, maintenance company) and by which individual projects (e.g. boiler replacement, relighting, isolation, etc.) are executed by separate contractors for each technique. This

	<p>method is typically time consuming and requires a project coordinator to manage the process of getting all of the individual projects executed in a timely manner. For a public authority to use this method requires separate public tenders for each individual projects. The method is therefore relatively resource intensive. It can be useful to have a Program Delivery Unit or other organization to act as an “integrator” of this method to ensure an end-to-end delivery of the energy efficiency program and provide a consistent level of service from the different contractors.</p>
Operating Services	<p>The Operating Services are the kind of services that are delivered by the Program Delivery Unit. They can be Marketing, Aggregation, Integration, Facilitation, Financial Advisory, Financing and Assessment.</p>
Marketing	<p>Marketing covers the commercialization of the services of energy efficiency to the beneficiaries. This covers the whole range of communication and commercial development services that are necessary to inform the beneficiaries of the types of offerings that are available to them. It also covers the pricing policy and product/services development.</p>
Aggregation	<p>Aggregation means that the Program Delivery Unit (PDU) bundles the projects or buildings of multiple beneficiaries into a single larger project. Aggregation is done to create economies of scale both operationally and financially.</p>
Integration	<p>Integration means that the Program Delivery Unit (PDU) acts as an intermediary between the beneficiary on one hand and the contractors or subcontractors on the other hand. This means that the contract for the delivery of the energy efficiency is signed between the integrator and the beneficiary and that the integrator signs contracts with the (sub)contractors. This role is often associated with the Separate Contractor Based implementation model, although it can also be applied to EPC or ESC. In the latter case, the integrator has back-to-back agreements with the beneficiary on one hand and the ESCO on the other hand.</p>
Facilitation	<p>Facilitation means that the Program Delivery Unit (PDU) does not sign the contract with the beneficiary, but coordinates or “facilitates” the whole process of project delivery on behalf of the beneficiary. The contracts are signed directly between the beneficiary and the contractors. This role is often played by the PDU in case of EPC or ESC implementation models, where the contract is signed directly between the beneficiary and the ESCO. Managing the tendering process is typically part of facilitation services offered in case of EPC or ESC projects.</p>
Financial Advice	<p>Financial Advice means that the PDU provides guidance and consultancy to the beneficiary on available funding for his project. This may include financial engineering and assistance in the negotiation of the best available financing or even arrange for the financing to be put in place. This can also include help in obtaining grants or technical assistance subsidies.</p>

Financing	Financing means that the PDU will itself provide financing, either through an own fund or by packaging external financing solutions into an integrated financing service. In this case the PDU takes on the financial risk of the project. This option is typically used where a dedicated fund is created as part of the energy efficiency program.
Assessment	Assessment is the role by which the PDU evaluates the technical and financial viability of an energy efficiency project and decides whether or not the project gets implemented and/or financed. The PDU will typically use a number of criteria to judge whether the project is acceptable or not.
Funding Vehicle	The Funding Vehicle is the entity that is used to finance the projects. It can be a fund (investment fund, utility fund, risk guarantee fund), a financial institution (bank), an ESCO or the property owner himself (public or private) and/or citizen (e.g. cooperatives).
Financial Instrument	The Financial Instrument is the financing technique that is being used to fund the projects. It can be equity, loans, grants, bonds (public or private), operational leasing, utility incentives (green or white certificates), on bill or on tax financing, EPC or ESC financing, MESA financing and/or a risk sharing facility.
Repayment model	Refers to the sources that the borrower is going to use in order to reimburse or repay the debt. Repayment can come from the guaranteed savings obtained from the ESCO, from shared savings agreed with the ESCO, from savings obtained through a Power Purchase Agreement or from reductions in Service charges.
Performance risk	The Performance risk defines which party covers the technical risk of the non-performance or under-performance in terms of energy efficiency goals or guarantees or financial guarantees. This risk can be covered by an ESCO, by the program owner, by the property or building owner, by the contractor and/or by an insurance provider.
Recourse	A legal agreement by which the lender has the rights to pledged collateral (property or other assets that a borrower offers a lender to secure a loan) in the event that the borrower is unable to satisfy debt obligation. Recourse refers to the legal right to collect. The finance institution may either assume the rights to the energy savings (receivables), may take a security interest in the project equipment (assets installed) or on the property of the borrower.
Financial risk	The Financial risk defines which party covers the financial risk of not living up to the obligations of reimbursing the financing (loan or other), default of payment and/or bankruptcy of the holder of the financial obligation.
Size of project (or project portfolio)	This is the estimated or average size of one individual project in the program. This is be the budget for the energetic renovation of one building or (in the case of EPC) of a pool of buildings. It can also be the size of one single energy efficiency measure in

	case of separate contractor based models.
Development/implementation stage	The Development/implementation stage defines whether the model is in its start-up phase (typically less than 2 years in service, with no or few projects executed), is in its growth phase (with a number of successful projects executed and growing more or less rapidly) or has reached a mature stage (with a lot of successful projects implemented and a steady growth).
Operational development maturity	The Operational development maturity defines the level of maturity of the model specifically in terms of being able to execute technically the projects and assuring their operations throughout the lifetime of the projects. It is also a measure of the operational capacity of the Program Delivery Unit.
Financial development maturity	The Financial development maturity defines the level of maturity of the model specifically in terms of being able to provide adequate financing to the projects, with more or less barriers to growing the amount of investments in relation to the global financial objectives. It is also a measure of the financial capacity of the PDU to engineer or provide financing.
Level of establishment	The Level of establishment is a qualitative measure for whether the model "in general" (and thus other identical or comparable models) is more or less well established throughout Europe. It can be a new model, one with a few examples or a well-established model with many examples.
Growth potential	The Growth potential is a qualitative measure for whether the model (and other identical or comparable) models has the ability to grow more or less rapidly and thus allow the increase of the number of projects under that model. Growth potential can be large or limited.
Scalability of the model	The Scalability of the model is a qualitative measure for whether the model can be more or less scaled-up, with or without having to increase accordingly the amount of financial or human resources. It can be low, moderate or high.
Replicability of the model	The Replicability of the model is a measure for whether the model (and other identical or comparable) models has a large potential for being duplicated in other regions or countries. It can be low, moderate or high.
Impact on public balance sheet	The impact on public balance sheet is a measure for whether the financing solutions that are implemented in the model generate more or less increase in public debt and allow or not public debt deconsolidation. This refers to ESA (European System of National and Regional Accounts) neutrality. It can be low, moderate or high.

2. Other definitions

Annual Percentage Rate (APR)	The annual rate (rather than just a monthly rate or fee) that is charged for borrowing (or made by investing), expressed as a single percentage number that represents the actual yearly cost
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	of funds over the term of a loan. This includes any fees or additional costs associated with the transaction. It is thus a finance charge expressed as an annual rate.
Baseline	<p>The baseline for energy consumption refers to the information collected by measuring a building's energy performance for a minimum of 12 months (36 months preferred). This baseline can serve as a starting point for setting energy efficiency improvement goals as well as a comparison point for evaluating future efforts and trending overall performance.</p> <p>It is actually the energy consumption that would have occurred during a defined period had the efficiency measures not been installed or the energy efficiency programme not been implemented.</p>
Bonds	A bond is a debt investment in which an investor loans money to an entity (typically corporate or governmental) which borrows the funds for a defined period of time at a variable or fixed interest rate. Bonds are issued by companies, municipalities, states and sovereign governments to raise money and finance their projects and activities.
Cogeneration	Cogeneration through combined heat and power (CHP) relates to the use of a heat engine or power station to generate electricity and useful heat at the same time.
Concession of services-type of tender	Is a contract of the same type as a public service contract except for the fact that the consideration for the provision of services consists either solely in the right to exploit the service or in this right together with payment.
Covenant of Mayors	Is the mainstream European movement involving local and regional authorities in the fight against climate change. It is based on a voluntary commitment by signatories to meet and exceed the EU 20% CO2 reduction objective through increased energy efficiency and development of renewable energy sources.
Demand side	Relates to end-use customers of energy. This is the opposite of supply-side which refers to the energy production side (e.g. utility companies).
Emphyteutic Lease	In an emphyteutic lease, the owner leases land or property to the lessee for a period of up to 99 years. But unlike a conventional lease, the lessee agrees, over the period of the lease, to add construction or improvements to the property so as to increase the value at the end of the lease period. At the end of the emphyteutic lease period is the property and all of its improvements revert to the lessor.
Energy conservation measure (ECM)	Is any type of project conducted, or technology implemented, to reduce the consumption of energy in a building. The types of projects implemented can be in a variety of forms but usually are designed to reduce utility costs: water, electricity and gas.
Energy Services Company (ESCO)	Is a business providing a broad range of energy solutions including designs and implementation of energy savings

	projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.
EPC Financing	EPC financing is a financial instrument in which an ESCO finances an energy efficiency project through an Energy Performance Contracting (EPC) model and by which the initial investment is partially or totally reimbursed from the guaranteed energy savings.
Equity	<p>Is mostly used when referring to an ownership interest in a business, especially when considered as the right to share in future profits or in appreciation in value of the business.</p> <p>Is also used to indicate funds contributed by the owners or stockholders of a business compared to funds borrowed from third parties (e.g. banks, investment funds...).</p>
ESC Financing	ESC financing is a financial instrument in which an ESCO finances a local energy production project through an Energy Supply Contracting (ESC) model and by which the price of the delivered useful energy is composed of 2 components: a fixed fee that corresponds to the reimbursement of the initial hardware investment by the ESCO and a variable fee that depends on the price of the fuel that is being used and delivered by the ESCO.
European Local Energy Assistance (ELENA)	Is part of the European Investment Bank's broader effort to support the EU's climate and energy policy objectives. This joint EIB-European Commission initiative helps local and regional authorities to prepare energy efficiency or renewable energy projects
European System of National and Regional Accounts (ESA)	Refers to the internationally compatible EU accounting framework for a systematic and detailed description of an economy.
Feed-in tariff scheme	Is a policy mechanism designed to accelerate investment in renewable energy technologies. It achieves this by offering long-term contracts to renewable energy producers, typically based on the cost of generation of each technology. Rather than pay an equal amount for energy, however generated, technologies such as wind power, for instance, are awarded a lower per-kWh price, while technologies such as solar photovoltaic are offered a higher price, reflecting costs that are higher at the moment
Local energy initiative (LEI)	Are projects initiated and managed by actors from civil society, that aim to educate or facilitate people on energy use and efficiency, to enable the collective procurement of renewable energy or technologies, to provide, generate, treat or distribute renewable energy derived from various renewable resources for consumption by inhabitants, participants or members who live in the vicinity of the renewable resource or where the renewable energy is generated.
Mobilising Local Energy Investments – Project	Funded under the Intelligent Energy Europe II programme. Addresses local and regional authorities or their groupings to

Development Assistance (MLEI-PDA)	develop projects or packages of sustainable energy projects which are of relevance for the local/regional territorial development and considered to be of 'bankable' scale by financing institutions and/or suitable for grant funding by EU financing schemes such as the cohesion or structural funds. Funds activities necessary to prepare, and mobilise finance for public investment programmes, such as feasibility studies, stakeholder and community mobilisation, financial engineering, business plans, preparation for tendering procedures
Net Present Value (NPV)	<p>Is the difference between the present value (value of an expected future cash flow determined as of the date of today or the date of valuation) of cash inflows and the present value of cash outflows. NPV is used to analyze the profitability of a projected investment or project.</p> <p>A positive NPV indicates that the projected earnings generated by a project or investment (in present value) exceeds the anticipated costs (also in present value). In general, a positive NPV indicates that the investment is profitable, and a negative one indicates that the investment is generating losses.</p>
Off-grid	Refers to not being connected to a grid, mainly used in terms of not being connected to the main or national electrical grid. It can refer to stand-alone power systems or mini-grids typically to provide a smaller community, home or building with energy.
Official Journal of the European Union (OJEU)	This is the publication in which all tenders from the public sector which are valued above a certain financial threshold according to EU legislation, must be published. The legislation covers organisations and projects that receive public money. The Publications Office of the European Union (L'Office des publications de l'Union européenne, or OPOCE) is responsible for the production of the OJEU. OPOCE is based in Luxembourg.
Pari passu	Gives equal repayment rights to all investors involved in a project in case of default.
Power Purchase Agreement	A Power Purchase Agreement (PPA) is a contract between two parties, one which generates electricity (the seller) and one which is looking to purchase electricity (the buyer). It defines all of the commercial terms for the sale of electricity between the two parties, including when the project will begin commercial operation, schedule for delivery of electricity, penalties for under delivery, payment terms, and termination.
Preferential loans	Government sponsored initiative to stimulate capital investment, especially in less-developed or high unemployment areas, by advancing loans at below market interest rates.
Relighting	Relighting is a renovation process in which current lamps and, if necessary, also fixtures, are replaced by LED lights or another alternative. Relighting can allow for a decrease of 50% to 80% in electricity consumption. Modern LED lighting provides a better quality of light and results in lower electricity costs.

Retrofitting	For buildings, this means making changes to the systems inside the building or even the structure (the envelope) itself at some point after its initial construction and occupation.
Revolving fund	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.
Risk sharing facility	Is an agreement between guarantors and lending institutions designed to share with the lending institutions some of the risk of loss associated with the lending institutions' extension of credit to borrowers. A Risk sharing facility typically reimburses a lending institution for a fixed percentage of incurred losses that exceed a predefined threshold (also called a first loss). Risk sharing facilities are often offered to lending institutions requiring credit risk protection but not funding.
Sustainable Energy Action Plan (SEAP)	Is the key document in which the Covenant of Mayors signatory outlines how it intends to reach its CO2 reduction target by 2020. It defines the activities and measures set up to achieve the targets, together with time frames and assigned responsibilities. Signatories represent cities, with different size from small villages to major metropolitan areas that have signed the Covenant of Mayors on a voluntary manner.
Third Party Financing	Refers solely to debt financing. The project financing comes from a third party, usually a financial institution or other investor, or the ESCO, which is not the user or customer.
Utility Fund	A utility fund invest primarily in the securities (equity, bonds,...) of gas, water and electric companies (utility companies) that supply water and power to cities and municipalities. They may also invest in firms that supply equipment or services for utility companies.
Utility incentives	Are federal, state, and local subsidies, which have been allocated to specific energy conservation programs (efforts directed toward electrical, water, and gas efficiency). White certificates are a typical example of a utility incentive.
White certificates	In environmental policy, white certificates are documents certifying that a certain reduction of energy consumption has been attained. In most applications, the white certificates are tradable and combined with an obligation to achieve a certain target of energy savings. Under such a system, producers, suppliers or distributors of electricity, gas and oil are required to undertake energy efficiency measures for the final user that are consistent with a pre-defined percentage of their annual energy deliverance. If energy producers do not meet the mandated target for energy consumption they are required to pay a penalty. The white certificates are given to the producers whenever an amount of energy is saved whereupon the producer can use the certificate for their own target compliance or can be sold to (other) parties who cannot meet their targets.

	<p>Quite analogous to the closely related concept of emissions trading, the tradability in theory guarantees that the overall energy saving is achieved at least cost, while the certificates guarantee that the overall energy saving target is achieved.</p> <p>A white certificate, also referred to as an Energy Savings Certificate (ESC), Energy Efficiency Credit (EEC), or white tag, is an instrument issued by an authorized body guaranteeing that a specified amount of energy savings has been achieved. Each certificate is a unique and traceable commodity carrying a property right over a certain amount of additional energy savings and guaranteeing that the benefit of these savings has not been accounted for elsewhere.</p> <p>In Europe several countries have implemented a white certificate scheme or are seriously considering doing so. Italy started a scheme in January 2005; France and Denmark a year later. Great Britain has combined its obligation system for energy savings with the possibility to trade obligations and savings. The Netherlands and Poland are seriously considering the introduction of a white certificate scheme in the near future.</p>
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3. Figure colour codes

	Program Authority/Shareholders
	Program Delivery Unit
	Beneficiaries/End customers/Projects
	Contractors/ESCOs
	Financiers/Financial institutions/Investment funds
	Technical & operational relationships/Technical contracts/EPC contractual relations
	Financial flows/Financial agreements/Investments/Funding
	Ownership relations/shareholder relations

