

New Financial Tool Sets for CSO Projects

Financial Instruments for Energy efficiency in Europe



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Publishable executive summary

This report sets out the challenges in supporting energy efficiency through collective self-organised (CSO) projects. In delivering the projects, government agencies and commercial contractors may play a leading role, producing public-led or market-led delivery models as oppose to the community-led model where a group of people or users initiate and manage the projects independently. Many financial tools have been developed, or are currently being developed to support the creation of those projects. Yet they often target governments, financial institutions and private investors whilst overlooking the role of the community. With the object to provide a list of potential financial instruments for a collective self-organised housing construction and retrofitting projects, we have identified a number of existing grants and loans for energy efficiency projects. Although most of the financial tools are not specifically directed for CSO, they can be employed as an alternative for financing the projects. Specifically for CSO projects, a list of potential financial tools were also identified and presented in this study.

The financial supports identified through this study are mostly a part of government's top-down approach where government play a major role in providing support through funding and grant. Alternatively, there is an emerging trend of new approaches as we have identified in this study. First, the financial support can be delivered through public-private partnerships (PPPs). PPPs are government service or private business ventures that are funded and operated through a partnership of government and one or more private-sector companies. The example of this approach is the commercialising energy efficiency finance (CEEF) programme where government works in partnership with local financial institutions (local banks and investors) by providing partial guarantees to share the credit risk of energy efficiency loan transactions. The second alternative approach in financing CSO projects is through crowdfunding. Crowdfunding is the collective effort of many individuals who pool their resources to support efforts initiated by other people or organizations. In energy efficiency projects, crowdfunding offers several benefits, including finance to small business and community organizations, speed in mobilizing funding and risk-taking.

Lastly, after showcasing several financial tools, the study has several recommendations for either policy practices or CSO project in general. In supporting CSO energy efficiency projects, policies need to consider the following points.

- There is no 'one solution fits all' approach but a more structured and comprehensive approach is needed to combine the different tools and adapt them to the national or regional characteristics and to the needs of the different market segments
- The public sector needs to act as first movers in promoting energy efficiency through financial tools but they have to involve a wide range of partners including the community at large such as in CSO projects.

For CSO project in practice, the study recommends the following points:

- Supports should be available through local, national and EU-wide schemes to help with project assistance, energy audits, and the preparation of tendering procedures and contractual arrangements.
- As the bank is unlikely to offer full financing of either the site purchase or the development, CSO projects should actively seek support from other source of funding and '*think outside the box*'.
- Different financing mechanisms can be deployed and blended together (e.g. grants and loans) depending on the objectives and needs of the projects.

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1. Introduction

Energy efficiency has been described as one of the most cost effective ways to enhance the security of energy supply and decrease the emission of greenhouse gases and other pollutants (EEFIG, 2014). Energy efficiency presents a viable option for the mitigation of human-induced CO₂ emissions. As energy efficiency can be implemented in many aspects of human life including production, housing and transport, there are many advantages associated with improving energy efficiency (IEA, 2003). In Europe, policies have been introduced to meet the EU 2020 energy efficiency goals where the objectives includes:

- 20% reduction of GHG emissions from 1990 level;
- 20% share of renewables in EU energy consumption;
- 20% reduction in energy consumption by improving energy efficiency.

To achieve those goals, the Energy Performance of Buildings Directive (EPBD) and the Energy Efficiency Directive (EED) were introduced. The EPBD announces numerous requirements including the energy performance certification for buildings, inspection regimes for boilers and air conditioning plants, and requirements for new buildings to be nearly zero-energy. Under the EPBD, new public buildings are to be nearly zero-energy by 2019 and all new buildings by 2021. The EPBD also requires member states to set minimum energy performance requirements for new buildings and buildings undergoing renovation. The EED contains a number of mandatory measures designed to deliver energy savings across all sectors. The strategy includes an overview of the national building stock, identifying cost-effective approaches to renovations, and encompasses policies and measures to stimulate cost-effective deep renovations of buildings and a forward-looking perspective to guide investment decisions.

Building sector is the major target as this sector represents 40% of final energy consumption in Europe. Buildings are long-term assets expected to remain useful for 50 or more years and 75-90% of those standing today are expected to remain in use in 2050. The current data shows that Europe faces a significant challenge as the overall sector is characterised by low demolition rates (0.1% per year), low renovation rates (1.2% per year) and low new construction rates (1% addition per year). One of the ways to deal with the challenge is by involving a group of people (community) to work together in realising the project rather than individuals or governments. While most of those communities have committed to energy efficiency goals, they lack support and solutions to address the large-scale renovation or construction of the new buildings. Overcoming the challenge of energy efficiency is not technical or technology related issues but is mainly financial. Thereby, effective financial tools are needed to unlock the potential of energy efficiency.

1.1 The Objective of the study

The main obstacle to implement energy efficiency projects is the financial barrier. For most of the energy efficiency projects, some level of external finance is essential. However, finding external investment is a big challenge for any energy efficiency projects. For commercial banks and private investors, traditional financial analyses are not easily applicable due to the difficult quantification of commercial value from energy efficiency. For those projects, the return on investment is ensured through energy savings and not through an increase in revenues, which makes it difficult for commercial banks and private investors.

To provide solutions for energy efficiency, many financial instruments have been developed, or are currently being developed. Yet, they often target private financial institutions such as commercial banks or local government agencies whilst overlooking the role of individuals and communities as the main actors for energy efficiency. For that reason, a

more structured and comprehensive approach is needed to combine the different instruments and adapt them to the national or regional context, and to the needs of the different market segments. This study focuses exclusively on collective self-organised initiatives in supporting energy efficiency through new build construction and retrofitting. However, the current and existing financial tools for energy-efficiency projects are not aimed solely for CSO project. In fact, they have been used to meet EU energy efficiency goals in general. For that reason, the report aims to identify different types of financial tools that are available in the market while at the same time try to capture the development of new and innovative way of financing energy efficiency which relevant to CSO projects.

1.2 Research approach

To achieve the objective of this study, we collected a wide variety of financial tools that are used for financing energy efficiency projects in new build construction and retrofitting. As there is no specific financial tools designed for CSO, the study collect all existing financial tools directed toward energy efficiency assuming that those tools can be used to support CSO projects. The research undertaken encompassed literature reviews, case studies and consultation including a variety of published reports, websites, and expert interviews. As a result, a database of different types of financial tools that may be applied to support CSO's energy efficiency projects was produced.

1.3 The structure of the report

In the next section, we identified the delivery models of CSO's projects where different stakeholders play their role. We then discuss the source of funding that currently exists to support energy efficiency projects in section 6. Section 7 presents the current financial tools for energy efficiency projects followed with a discussion on innovative ways of financing CSO projects. At last, we conclude our study and discuss the recommendation in section 8.

2. Delivery models of energy efficiency projects

In delivering energy efficiency projects, there are three models of delivery where different actor plays a major role in conveying the project.

<p>Public-led model</p>	<p>Government or public sector bodies are the main stakeholders in creating collective self-organised housing construction and retrofitting.</p>
<p>Example:</p> <p>New Barracks Estate Retrofit Scheme, UK</p> <p>Energy efficient retrofit of 78 single-family properties in Salford, UK led by Salix Homes (local social housing organisation). Funded by grants and subsidies from city council.</p> <p>Kirklees Warm Zone (KWZ), UK</p> <p>Yorkshire Energy Services (public) managed programme and delivered the project through partnership with a private contractor. Results included installation of insulation in more than 50,000 properties and estimated net social benefits of £249 million. Funded through asset sale and utility obligations schemes aiming at home insulation (loft and cavity wall).</p>	
<p>Community-led model</p>	<p>Group of people (a community) has the initiatives and deliver the collective self-organised housing construction and retrofitting projects.</p>
<p>Example:</p> <p>Lancaster CoHousing, UK</p> <p>Construction of energy efficient housing for more than 40 families was started as a community project. The cohousing concept has applied for funding coming from many different resources, from government grants to individual investments.</p> <p>West Oxford Community Renewables (WOCORE), UK</p> <p>The community sells power generated from micro-renewables to the local community and excess power to the grid. Profits raised are reinvested in low carbon projects in the community. The programme is funded by two separate grants won through government-funded competitions, and a share issue.</p>	
<p>Market-based model</p>	<p>Contractors or commercial companies usually act as initiator and project coordinator for collective self organised housing construction and retrofitting projects.</p>
<p>Example:</p> <p>Birmingham Energy Savers (BES), UK</p> <p>The company (BES) work on retrofitting project of 60,000 properties using an on-bill financing mechanisms. BES is also expected to provide financial support alongside grants and subsidies.</p>	

This study focuses on community-led model where a group of people initiate or manage the projects. To illustrate, we present two models, co-operative and community benefit models.

Co-operative model

Cooperative concepts are based on community cooperation, which sometimes can be formal or informal. This model works for the mutual benefit of members. This is based upon the common economic, social and cultural needs or interests of the members. As community model, a co-operative models could play a major role in the EU climate strategy, bridging the gap between high-level international climate agreements and smaller actions taken at an individual level. They can also provide huge social benefits, bringing people together and providing an opportunity for local ownership and investment.

Example: Local Energy Cooperatives (LEC), UK

Local Energy Cooperatives (LEC), UK is a group of citizens that cooperates in the field of renewable energy, developing new production, selling renewable energy or providing services to new initiatives'. The aim of an LEC is typically to contribute to energy transition and often to become energy independent on a local level. To this end, they undertake one or more of the following activities:

- Reselling renewable energy.
- Producing renewable energy.
- Mobilising and organising local stakeholders.
- Providing knowledge and services in the field of renewable energy and/or energy savings.

The benefits of LECs include strengthened community engagement. LECs typically also have a community value mission and focus on more than financial gain, such as revitalising the community, reducing pollution, and leaving a cleaner environment for the future.

Example: Carbon Co-op in Manchester, UK

Based in Greater Manchester, Carbon Co-op aims to make radical reductions in home carbon emissions through adoption of energy efficiency measures - whole house retrofit. They pool resources to acquire technical skills, access to finance, share experiences and to bulk purchase materials at discount. 2014 saw Carbon Co-op deliver Community Green Deal, a unique programme of nine whole house retrofits for owner occupier members around Greater Manchester. Household holders received multiple energy efficiency improvements including external and internal wall insulation, triple glazed timber windows, new boilers, passive stack ventilation and solar PV. The project benefitted from Carbon Co-op's bulk procurement services to achieve a discount on the purchase of energy efficiency improvements, combined with cutting edge architectural and retrofit experience from technical partners URBED. Carbon Co-op are now in the process of developing My Home Energy Planner, an online whole house assessment and decision making tool to assist householders in procuring retrofit works.

Community benefit model

This model works for the benefit of the community at large, rather than just for members of a cooperative. This means that it must have an overarching community purpose that reaches beyond its membership. An applicant enterprise must also have a special reason for being a community benefit society rather than a company, such as wanting to have democratic decision-making built into its structure. A community benefit society can opt to have a statutory asset lock, which has the same strength as the asset lock for a charity and for a community interest company. This type of asset lock is not currently available for co-operatives while the model aims to satisfy the benefit of the community.

Example: Low Carbon Hub Oxfordshire, UK

The community rose over £1.6 million to develop 1MW of solar PV on local schools and business. In the operation, the Hub received multiple funding with some of the funding from the Intelligent Energy Europe programme of the European Union. The Low Carbon Hub Oxfordshire has two main streams of activities:

- Powering down communities (energy efficiency oriented) – working with community groups to recruit households for energy efficiency improvements, and looking at how best to install energy saving measures in local homes, schools and businesses.
- Powering up communities (RES oriented) – where the team helps community groups to develop renewable energy projects based on the natural resources of a particular area, providing support to communities from feasibility, planning and tendering through to raising the finance and project completion.

In addition, the hub also helps the local economy by retaining the revenues from renewable energy projects within the community and increased awareness of climate change.

3. Funding sources

In this section, we provide an overview of source of funding that can be used to finance CSO’s energy efficiency construction and retrofitting projects.

3.1 European funding

The European Union has been supporting the improvement of the energy efficiency for many years with a range of financing instruments. The table below gives an overview of the instruments and available funding:

Funding source	Instruments	Total funding
Cohesion Policy Funding	Operational Programmes incl. financial instruments such as JESSICA.	EUR 10.1 billion planned for sustainable energy with EUR 5.5 billion specifically planned for energy efficiency
Enlargement Policy Funding	IFI facilities including SMEFF, MFF, EEFF.	EUR 552,3 million
European Energy Programme for Recovery (EEPR)	European Energy Efficiency Fund (EEE-F) and Intelligent Energy Europe (IEE).	EUR 265 million with 70% of funding to be dedicated to energy efficiency
Competitiveness and Innovation Framework Programme (CIP)	Intelligent Energy Europe Programme (e.g. ELENA) Information and Communication Technologies Policy Support Programme (ICT PSP).	Approximately EUR 730 million for each Programme with 50% of the funding was dedicated to energy efficiency
The European international financial institutions (IFIs)	Several financial instruments provided by EIB, EBRD, CEB.	

5.1.1 Cohesion fund

Using several different financial instruments, the cohesion policy aims to help regions to face long-term challenges and increase the impact of the policy. While the general themes of the cohesion policy is to support economic, social and territorial cohesion across the EU and to contribute to the objective of Europe 2020, the specific thematic objectives on climate change and energy covers: (1) shift towards a low-carbon economy, (2) climate change adaptation and risk prevention and management, (3) environmental protection and resource efficiency, (4) sustainable transport and removing bottlenecks in key network infrastructure. With total budget of 63.4 billion euro, the cohesion fund is aimed at member states whose gross national income per inhabitant is less than 90% of the EU average.

5.1.2 Enlargement funding

Another potential source of funding for energy efficiency projects, especially for CSO initiatives, comes from several European international financial institutions (IFIs) such as the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), the Council of Europe Development Bank (CEB) and the Kreditanstalt für Wiederaufbau (KfW). From the total EU allocation of approximately EUR 550 million, around one third has been allocated for energy efficiency projects targeting both the industry and buildings sectors. Through these facilities, the

IFIs help local banks to reach smaller and risky projects. In addition to funding, a substantial and complex technical assistance package that builds capacity in the local market and helps local investors and banks overcome some of the barriers that hinder the implementation of these energy efficiency investments.

5.1.3. European Energy Programme for Recovery (EEPR)

The programme is aimed to fund projects in three main areas of energy sectors, including (1) gas and electricity infrastructures, (2) offshore wind energy, and (3) carbon capture and storage. The funding provided by the programme can be used for projects such as the development of public and private building which integrate technical solutions for energy efficiency, investment in efficient combined heat and power, clear urban transport, etc. Within the programme, there are two financial instruments:

- **The European Energy Efficiency Fund (EEE-F)**

The European Energy Efficiency Fund (EEE-F) was established in 2011 with a total budget of EUR 265 million with around 70% of the funding is intended for energy efficiency projects. The funding comes from the European Union and several national banks. The fund provides debt, equity and guarantee instruments for commercially viable projects, as well as technical assistance grants to support project development (legal, financing and technical structure of the project). The targets of this funding are local and regional government or private organisations acting on their behalf. In order to qualify for the funding, projects must achieve at least 20% savings in primary energy demand and they must achieve a performance improvement of at least two categories related to the energy performance certificate.
- **Intelligent Energy Europe (IEE)**

The intelligent energy Europe (IEE) aims to boost activities that help to achieve the EU's energy target. More specifically, IEE's objective is to support the overcoming of non-technological barriers to the innovation, uptake, implementation and dissemination of solutions that contribute to sustainable, secure and competitively priced energy for Europe. With around EUR 56 million has been made available on the budget, the programme consider local authorities as a main target group. With support from IEE, the local actors will be able to develop sustainable energy policy in local level.

5.1.4 Competitiveness and Innovation Framework Programme

The competitiveness and innovation framework programme supports innovation activities (including eco-innovation) and target small and medium size enterprises (SMEs). The objective of the programme is to provide better access to finance and deliver business support services in the regions. Within the programme, there are several financial tools that provide funding for energy efficiency.

- **European Local Energy Assistance (ELENA)**

The European Local Energy Assistance (ELENA) aims to boost investment project in the areas of energy efficiency, renewable energy sources and sustainable urban transport. The ELENA programme provides grants to local and regional public authorities. The facilities is implemented through IFIs (EIB, CEB, EBRD, KfW) and covers up to 90% of cost incurred for technical support needed for feasibility and market studies, project structuring, energy audits and the tendering process.
- **The information and Communication Technologies Policy Support Programme (ICT-PSP)**

The programme aims to stimulate a wider uptake of innovative ICT based services and the exploitation of digital context across Europe. Funding usually goes to pilot actions, involving both public and private organisations for validating in real setting, innovative and interoperable ICT based services in areas such as energy efficiency and smart mobility. The programme also provides support in sharing experience and

preparing the deployment of innovative ICT based solution as well as monitoring the information society through benchmarking and awareness raising actions.

5.1.5 The European International financial institutions (IFIs)

In addition to the previously mentioned EU funding programme, the European International financial institutions (IFIs) has operated their own financial instruments for energy efficiency. Energy efficiency project such as CSO may take advantages from these sources of funding.

- **European Investment Bank (EIB)**

The EIB's role is to contribute towards the integration, balanced development and economic and social cohesion of the EU. This objective can be achieved by providing long-term lending to member state.

- **European Bank for Reconstruction and Development (EBRD)**

Another EU IFI is the European Bank for Reconstruction and Development (EBRD). Since 2002, EBRD has invested EUR 2.3 billion in 153 energy efficiency projects in its EU countries of operations.

- **Central Europe Development Bank (CEB)**

The Council of Europe Development Bank (CEB) has provided a total of proximately EUR 2.4 billion to projects on energy efficiency and energy renewable. Out of this total, more than EUR 1.9 billion (i.e. more than 75%) was devoted solely to energy efficiency. EU funding in support of these investments amount to approximately EUR 181 million since 2002 through various sources.

Overall, European sources of funding offers a great deal of opportunity for community-led energy efficiency projects. However, the barrier is lack of information and knowledge of getting the funding. There is a need for more grounded approach where users such as a community can access the funding.

3.2 Public funding (national, regional and local government funding)

In addition to funding from EU, each member state may use their own budgets to support energy efficiency. For example, there are a wide range of grants that are available from a number of organisations in the UK such as the Energy Savings Trust and the Carbon Trust. For CSO projects, the funding from government is crucial and provides a great endorsement for the projects. Most of the CSO projects have received support from government through grants, tax incentives, etc.

3.3 Private funding

Nowadays, the private sector is increasingly important as a driver for financing CSO energy efficiency projects. Besides building owners who invest in upgrading their properties and homes, Utilities Company have also played a significant role. Moreover, commercial banks are increasingly also showing interest in this sector. A good example of a private sector scheme is the energy supplier obligations scheme in the UK. Under this scheme, energy suppliers are obliged to meet CO2 reduction targets by encouraging households to voluntarily adopt energy saving measures. Energy suppliers are free to decide how to achieve their targets, but have typically promoted the most cost-effective measures such as cavity wall and loft insulation. The households eventually pay for the suppliers' investments via higher energy prices. For some of the CSO projects, the initial investment is often generated from members' savings and investment.

4. Financial tools for energy efficiency projects

In this section, we describe the several financial tools that are available for energy efficiency. The financial tools are classified into two categories, the existing financial tools and the emerging financial tools. The existing tools are financial support and incentive that have been used to finance energy efficiency projects while the emerging financial tools are financial support and incentive that have been introduced in the last few years.

4.1 Existing financial tools

6.1.1 Dedicated credit lines

Dedicated credit lines (or soft loans) are credit lines established by government agencies or donor organisations such as the European IFIs, to make a private sector organisation such as a commercial bank or a financial institution capable of financing energy efficiency projects. The approach is achieved by providing funding so the financial institutions such as local banks or private investors are able to fund energy efficiency projects. Dedicated credit lines are effective in overcoming the issues related to insufficient availability of funds for energy efficiency project as it leverages an increase in lending by the private partners. They also address the issue of insufficient lending due to the financial institutions' lack of knowledge on the benefits of the energy efficiency projects.

Examples of project	
Name	Green loan for social housing, France
Delivery model	Public-led model
Type and source of finance	Public and private funding
Project overview and targeted barriers	The green loan provides financial support for the improvement of the energy performance of the social housing. The programme plans a renovation of the 800,000 social housing consuming most energy from 2009 to 2020 and the restoration of 100,000 social housing units in 2009 and 2010. EUR 1.2 billion of loan with a fixed rate of 1.9% on 15 years is available to finance the restoration of the first 100,000 social housing units.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Leverage effect of public funds is usually between 4 and 10, which is higher than traditional grants. • Flexibility according to individual preferences • Easy to implement • May access EU cohesion funds. • Positive impact on public budget • Usually have a longer duration than commercial loans 	<ul style="list-style-type: none"> • Limited by the capacity of owners to take more loans. • Banks may need support and guarantee from governments. • Some potential of complicated administration and application process. • May need to consider non-energy aspect and measure.

6.1.2 Risk sharing facilities

Risk sharing facilities are partial risk or partial credit guarantee to reduce the risk of energy efficiency project. By sharing the risk through a guarantee mechanism, the facility enables to increase private sector lending to the project. Under this scheme, the government agencies or donor organisations provide a partial guarantee that covers a portion of the risk which may motivate financial institutions such as commercial banks and private investor to increase their lending to the energy efficiency projects.

Examples of project	
Name	Hungary Energy Efficiency Co-Finance Program (HEECP) and Commercializing Energy Efficiency Finance program (CEEF) program, Hungary
Delivery model	Public-led model
Type and source of finance	Public and European funding
Project overview and targeted barriers	The first phase of this programme (HEECP) provided finance and advisory services to eligible financial institutions in Hungary for financing EE projects. The second phase of the programme aimed at facilitating guarantees for private companies, which worked on the implementation of project. In 2003, the CEEF was launched for Central Eastern European and Baltic States (Czech Republic, Slovakia, Lithuania, Latvia and Estonia). In 2005, the HEECP was merged into CEEF due to the success of HEECP and achieved goals to be replicated in the CEEF countries. The objective of CEEF were to develop financing structures to be later offered to other developing countries, upscale business, and increase awareness raising and capacities of financial institutions on energy efficiency market activities.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Reduce the risk and provide extra leverage for financial institutions. 	<ul style="list-style-type: none"> • Need time to negotiate and develop knowledge to implement at regional and local government level. • Intrude the market model if all substantial risk is removed from the financial institutions. • Too complex for small financial intermediaries and institutions. • Need a greater collaboration and resource commitment on the design and implementation of the instrument.

6.1.3 Subordinated loans

Subordinated loans (or mezzanine loans) are a debt capital that gives the lender the rights to convert to an ownership or equity interest in the company or projects if the loan is not paid back in time and in full. Since the loans are provided to the borrower with little due diligence on the part of the lender and little collateral on the part of the borrower, this type of loans requires a high return on investment. For sustainable energy projects, subordinated debt loans are cheaper than what would be available on the equity market and do not usually involve sacrificing any control of the projects. Subordinated debt is considered as a complementary or alternative solution to portfolio guarantees which may be very useful for those countries that need to move away from a grant dependent situation, where what would have been a grant becomes a long-dated, low interest subordinated loan.

Examples of project	
Name	KfW Programme Energy-Efficient Construction, Germany
Delivery model	Public-led model
Type and source of finance	KfW bank
Project overview and targeted barriers	The programme provides financing for construction, production and first acquisition of KfW Efficiency Houses. The programme comes in the form of a long-term, reduced-interest loan with a maturity of up to 30 years including up to 5 repayment-free start-up years, with fixed interest period of up to 10 years, and up to 100% of the building costs but not more than EUR 50,000 per housing unit.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Leverage private bank funds • Reducing the interest • Increasing the term of financial package • Reducing default for the senior lenders. 	<ul style="list-style-type: none"> • Need time to negotiate and develop knowledge to implement at regional and local government level. • Intrude the market model if all substantial risk is removed from the financial institutions. • Lack of best practice examples.

6.1.4 Covered bonds

For financing energy efficiency, the covered bond is very attractive for both the borrowers and the lenders. It is because a cover pool of financial assets provides backing so that investors are prepared to accept relatively low returns compared to other investments. The advantage for commercial banks in issuing covered bonds is because they can access large pools of money easily and at better rates than unsecured source of loans. This enables the banks to provide loans for eligible projects at a lower risk. Theoretically, a covered bond is a much safer instrument than a simple bank bond, so it gets a higher credit rating. Covered bonds are regulated by national legislations in each EU Member State, which ensures that they get very high credit rating.

Examples of project	
Name	Munchener Hyp ESG covered bond, Germany
Delivery model	Market-led model
Type and source of finance	European, public and private funding
Project overview and targeted barriers	The aim of the programme is to finance loans for housing cooperatives in Germany. The funds will be used to purchase, build, improve the energy efficiency of and maintain housing for more socially disadvantaged sections of society. Münchener Hypothekenbank eG is planning a future programme of financing for housing cooperatives of between EUR 50 million and EUR100 million per annum, which will be based on the same sustainability criteria of this first ESG Pfandbrief.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Cheap capital for banks • Lower capital requirements for investors • Solid and well-established legal framework 	<ul style="list-style-type: none"> • Lack of experience of investors • Legal framework at national level need to be clarified • Lack of clear objective, definition and clarity.

6.1.5 Leasing

Leasing is a form of access to finance based on a contract between two parties, the lessor and lessee. The lessor provides an asset for use to the lessee for specific period of time in return for specified payments. Leasing is based on the proposition that income is earned through the use of asset rather than from ownership. Ownership rests in the hands of the lessor (financial institution, including banks or leasing company), while the business has the actual use of the equipment. In energy efficiency, leasing can be used to overcome the issue of higher upfront costs for energy efficiency investments, as payments in a lease merge capital and operational expenditures.

Examples of project	
Name	Solar Photovoltaic finance, United Kingdom
Delivery model	Market-led model
Type and source of finance	Private funding
Project overview and targeted barriers	Using support from Siemens Financial Services and the Carbon Trust, the programme combines technical knowledge and financial expertise to offer tailored financing solutions that meet each individual organisation's requirement.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Conserving working capital and avoiding down payments. • Well-established method and instrument. • Some tax advantages. 	<ul style="list-style-type: none"> • Restricted to removable assets. • Host may pay a higher price over the long term. • Leasing commits host to retain the equipment for a certain period of time, which may cause a 'lock-in' effect in technology adaptation. • Lack of best practice examples.

6.1.6 Energy performance contracting

Energy saving performance contracts (ESPCs) are public sector initiatives in the form of legislation or regulation established by government to facilitate the implementation by ESCOs. An Energy Performance Contract is a contractual arrangement between a host beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.

Examples of project	
Name	London RE:FIT programme, United Kingdom
Delivery model	Public led model
Type and source of finance	Public funding
Project overview and targeted barriers	The aim of the project is to help accelerate reduction of energy use, cutting energy bills and helping the delivery of the Carbon reduction targets for London's public buildings. The scheme uses an Energy Service Company (ESCO) to implement energy efficiency measures, which enable organisations to cut, running costs, energy consumption and carbon emissions. The ESCO guarantees the level of energy savings, thus offering a secure financial saving over the period of the agreement.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Guarantee in saving • Professionalism and expertise of energy performance contract provides. • Can bring financing or facilitate access to finance through savings guarantee. 	<ul style="list-style-type: none"> • Too focused on short payback time due to low risk requirements. • Increases transaction cost. • Lack of standardized framework. • Procurement regulations may not be adapted at national level. • Lack of confidence in ESCOs. • Fear of externalization of energy management. • Lack of access to public support schemes for energy performance contract providers compared to project host and in-house ESCOs. • Difficulties in achieving or guaranteeing energy performance targets because actual energy performance and thus savings are to a large extent determined by behaviour of the users of the building

4.2 Emerging financial tools

6.2.1 Energy efficiency investment funds

Energy efficiency investment funds are an emerging financial tool, which are similar to the existing programmes such as dedicated loans or subordinated loans. Using governments as promoter and guarantor, energy efficiency investment funds are created to invest only in energy efficiency projects, which are targeting a return based on energy savings achieved. These funds target the generation of on-going operational cost savings and carbon emission reductions as well as improvements to productivity and asset values, in compliance with current and prospective regulations.

Examples of project	
Name	Sustainable Development Capital Limited, UK and Ireland
Delivery model	Market-led model
Type and source of finance	Private funding
Project overview and targeted barriers	SDCL's investment business is focused exclusively on energy efficiency project finance. SDCL has established specialist funds in the UK, Ireland and Singapore and is launching new funds in New York and China. SDCL's funds in each country are in partnership with governments as an investor, promoter or guarantor. The funds invest in energy efficiency retrofit projects and seek a return based on savings achieved.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Attractive to investors 	<ul style="list-style-type: none"> • High return and liquidity makes it difficult to show a clear business case to investor. • Need guarantee from public funding.

6.2.2 Energy service agreement

The Energy Service Agreement (ESA) is in some ways an evolution of the traditional shared-savings model run by ESCOs through Energy Performance Contracts (Energy Performance Contracts). However, ESA is structured more like a Power Purchase Agreement (PPA) and used more frequently by actors present in the mainstream energy markets. The focus of the contract is on providing services to customers. The Energy Service Agreement (ESA) is a "pay-for-performance" service contract between a third-party investor and an asset owner to deliver energy savings as a service. A third party investor and an asset owner enter into an ESA contract (typically for 10 years) where the asset owner agrees to pay their historical utility bills to the third party. The third party invests into energy saving and energy efficient opportunities and operates the energy equipment to provide "services" to the asset/ building. In industry, ESA needs to take into account the risk of decreased activity and thus could have to adapt the contract duration, as well as guarantee a residual value for the assets.

Examples of project	
Name	Transcend Equity's MESA Mechanism, US
Delivery model	Market-led model
Type and source of finance	Private funding
Project overview and targeted barriers	Transcend Equity offers a financial tool known as MESA (Managed Energy Service Agreements) for commercial property owner to make their building more energy efficient without new capital commitments. This savings model is based on owned paying fixed utility rates in exchange for services like energy efficiency upgrades and. The model provides the owner with long-term cost and energy savings and more desirable rental estate at no additional expenses. This model has largely eliminated the barriers and complexity that comes with project run by ESCOs by simply substituting the monthly service fee for the existing utility bill.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Contract does not require new regulations. • Overcome some traditional energy efficiency barriers. 	<ul style="list-style-type: none"> • Market share is still relatively small and fragmented. • Increases transaction costs. • Requires more developed skills on the client sides. • Lack of standardised framework. • Need for more pilot projects to help develop the market. Fear of externalisation of energy management.

6.2.3 Factoring fund for energy performance contract

Factoring fund is another evolution of energy performance contracts that already exist. In energy efficiency terms a factoring fund for Energy Performance Contracts would purchase funded Energy Performance Contracts from their originators (usually ESCOs) at a discount, freeing up the balance sheet of the originators to originate more Energy Performance Contracts. An objective of this kind of fund would be to allow small ESCOs (once up the learning curve) to continue generating Energy Performance Contracts without breaching their own balance sheet covenants and limits with their banks. A factoring fund may need public equity to speed its launch into the market; however, it could also involve private equity and debt, if the public sector takes the first-loss risk or requires a lower return on equity.

Examples of project	
Name	The Bulgarian Energy Efficiency Fund (BgEEF) Bulgaria
Delivery model	Market led model
Type and source of finance	Public and private funding
Project overview and targeted barriers	Established in February 2004, the Bulgarian Energy Efficiency Fund (BgEEF) is a public-private for-profit entity, independent from any public or private institution. BgEEF provides technical assistance to Bulgarian companies, municipalities and individuals in the development of investment projects in energy efficiency and then accompanies their financing, their co-financing or acts as guarantor to other financial institutions. BgEEF offers three main financial products: direct loans to projects, partial credit guarantees and portfolio guarantees:

Advantages	Weaknesses
<ul style="list-style-type: none"> • Secure refinancing for energy performance contract provides, clearing their balance sheets and contributing to lower capital costs. • Attractive to investors. 	<ul style="list-style-type: none"> • Takes time to mature (very early stage with limited best practices). • Require public support (funding) to start. • Need to be analysed and adapted country-by-country. • Lack of a clear project pipeline.

6.2.4 Green bonds

Green bonds are a financial instrument to raise capital to support projects and activities that promote energy efficiency. Given the long-term and stable characteristics of energy efficiency investments, green bonds becomes a natural place for investors to seek capital for investments in green buildings and energy efficiency in industry. Green bonds can finance investments in energy efficiency of buildings and industry in two ways: either directly through bonds issued by corporations, or indirectly through bonds issued by banks, which in turn can on-lend to all types of energy efficiency projects.

Examples of project	
Name	Vasakronan Green Bond Framework, Sweden
Delivery model	Market led model
Type and source of finance	Public and private funding
Project overview and targeted barriers	Vasakronan issued green bonds for SEK 2.5 billion, making it the largest issuer in Sweden. Since November 2013, Vasakronan has issued green bonds for SEK 3.8 billion. The approved investment amount covered by the framework for green bonds amounted to SEK 4.4 billion.

Advantages	Weaknesses
<ul style="list-style-type: none"> • Large pools of investor • High leverage effect • No need for public funding • Strong market responses • Diversification of investor base • Strong demand from investors 	<ul style="list-style-type: none"> • Need to meet investor's requirement and expectation. • Lack of clear definition of and standards for green bonds in technical and governance terms.

6.2.5 On-bill repayment

On-bill repayment offers an opportunity for consumers to choose energy efficient services. Consumers can obtain cost-effective energy savings at no upfront cost. Consumers pay for energy efficiency upgrades over time on their utility bill. On-bill repayment is designed to have cost savings that exceed the monthly payment, so consumers save energy and money at the same time. Unlike utility run energy efficiency programme, on-bill repayment does not cost ratepayers or taxpayers money where the upfront cost is borne by qualifying financial institutions. On-bill repayment can accommodate a variety of energy-saving opportunities including equipment purchases, equipment leases or even Energy Service Agreements and Power Purchase Agreements.

Examples of project	
Name	Green deal, United Kingdom
Delivery model	Public led model
Type and source of finance	Public funding
Project overview and targeted barriers	The Green Deal is a government initiative to improve energy efficiency in UK households. As part of the 2011 Energy Act, the initiative aims to make millions of homes and businesses across Britain more energy efficient from January 2013. Up to £10,000 is available for the works and the money will be repaid back over 25 years. It is important to note the Golden Rule which means the money paid back will never be more than the saving made e.g. if wall insulation saves you £135 a year, you will never pay back more than £135 a year. The money is not paid back directly to the lender, but added to the property's energy bills. The person in charge of the energy bills is therefore responsible for repayments (even if the property changes hands).

Advantages	Weaknesses
<ul style="list-style-type: none"> • Energy savings connected to energy bills. • Public sectors and utilities are more trusted by policy makers. • Reduce transaction costs. • Overcomes the slit incentive overtime as repayment obligation can be passed attached to the asset. • Overcome the lack of finance capacity of homeowners and SMEs. 	<ul style="list-style-type: none"> • May require additional public funding. • Can be perceived as complex by users and may require technical assistance. • Complex instrument to manage, • May require changes in the legal framework in order to comply with bank regulation. • May require modification to utility/tax collection processing systems and tax code/energy laws. • How to determine savings from e.g. wall insulation (depends on user behaviour)? • The poor take-up of these funds has meant the UK government has announced the phasing out of this programme.

6.2.6 On-tax finance

On-tax finance is a scheme in which money is lent to a building owner to retrofit a building, but the loan is attached to the property and reimbursed through local taxes by the occupant. The fact that payments are integrated in local taxes enhances their creditworthiness. If the building is sold, the “loan” can be reimbursed, or taken on by new owner. If the building is rented, it is the tenant who pays the tax and benefits from the savings, and the change of tenant has no impact on the repayments. Financing can be provided by the local authority or by private funds while in the latter case, the role of the public sector is to secure reimbursement by integrating it in tax collection (usually against a collection fee) and the private companies are in charge of engaging building owners and signing contracts with them.

Examples of project	
Name	Energy Investment Allowance (EIA), The Netherlands
Delivery model	Public led model
Type and source of finance	Public funding
Project overview and targeted barriers	The Energy Investment Allowance has encouraged entrepreneurs who invest in relatively innovative energy-efficient technologies or projects of renewable energy to deduct (under certain conditions) part of their investment costs from their corporate income tax. The EIA was established to overcome the disincentive to invest in energy efficient technologies and renewable energy. Such investments would be considered low priority or not cost-effective without an incentive to invest such as the EIA.

Advantages	Weaknesses
<ul style="list-style-type: none"> Overcomes the slit incentive overtime as repayment obligation can be passed attached to the asset. Can be used to finance deep renovation Can be run with public and private finance. 	<ul style="list-style-type: none"> Impact on public debt if financed through public money. Legal complications and need modification to the tax collection system in some countries.

4.3 Summary on the existing financial tools

In this section, we assess the relevancy of existing financial tools based on the delivery model and source of funding. We also consider the type of agreement between the partners and how risk is spread among the partners. Overall, the existing financial instruments have offered a wide range of alternative products which sometimes offer similar arrangements.

Types of models	Brief description	Delivery model	Source of funding	Role of governments	Agreements between government and private	Allocation of risk between partners	Potential for financing CSO projects (Y/N)
Dedicated credit lines	Governments, banks or private investors provide low-interest loans to encourage local financial institutions to support energy efficiency projects.	All	EU, public	Direct financing	Loan agreement between partners	Project partner share risk with governments takes a large proportion of risk	Yes, it commonly exists in several government schemes, such as green loans.
Risk-sharing facilities	Governments, banks or private investors offer guarantee product to absorb some energy efficiency project risk and encourage local financial institutions to involve in financing energy efficiency projects.	All	EU, public, private	Indirect financing	Guarantee facility agreement	Public partner absorbs some financial risk	Yes, it has successfully applied in several European countries for retrofit projects.
Subordinated loans	Governments, banks or private investors help to absorb some energy efficiency project risk.	All	EU, Public	Indirect financing	Loan agreement between partners	Project financing risk shared between partners	Yes, it has been applied through PPPs (public-private partnerships) scheme.
Covered bonds	Governments, banks or private investors cover pool of mortgage loans or debt instruments.	All	EU, Public	Indirect financing	Loan agreement between partners	Project partner share risk with governments takes a large proportion of risk	Yes, it has led by commercial financial institutions, such as bank.
Leasing	ESCOs own and leases equipment to customers, ESCOs maintain the equipment and customer operated the equipment.	Market	Private	Tax incentive	Local financial institutions, ESCOs and customer agreement	Risk shared between private investor, ESCOs and customers	Not directly, but it can be used through ESCOs.
Energy performance	ESCOs enter into agreement with government agency to provide services with payment	All	Private	No financing but regulation	Energy service agreement	Performance risk generally borne by	Not directly, but it can be used through ESCOs,

contracting	contingent on the demonstration of performance.					ESCOs or private investors	especially for retrofit projects.
Energy efficiency investment funds	Governments, banks or private investors provide low-interest loans to encourage local financial institutions to supplier energy efficiency projects.	All	EU, public, private	Direct financing	Loan agreement between partners	Project partner share risk with governments takes a large proportion of risk	Yes, it has been applied through market and community-led models.
Energy service agreement	A third party investor and an asset owner has pay for a performance agreement to deliver energy saving as a service.	All	Private	No financing but regulation	Energy service agreement	Performance risk generally borne by ESCOs or private investors	Yes, it has been applied through ESCOs.
Factoring fund for energy performance contract	ESCOs enter into agreement with public agency to provide services with payment contingent on the demonstration of performance.	All	Private	No financing but regulation	Energy service agreement	Performance risk generally borne by ESCOs or private investors	Yes, it has been applied through ESCOs.
Green bonds	Governments provide low-interest loans to encourage local financial institutions, investors and community to support energy efficiency projects.	All	EU, public, private	Direct financing	Loan agreement between partners	Project partner share risk with governments takes a large proportion of risk	Yes, it has effectively used to support CSO projects.
On-bill repayment	Governments improve the creditworthiness of energy efficiency investments by having them repaid within the utility, tax or bill through the existing payment infrastructures.	All	EU, public, private	Direct financing	Local financial institutions, ESCOs and customer agreement	Project financing risk shared between partners	Yes, It has been applied in different schemes through utility services and ESCOs services.
On-tax finance	Governments integrate the loan through local taxes which also increase creditworthiness.	All	EU, public, private	Direct financing	Local financial institutions, ESCOs and customer agreement	Project financing risk shared between partners	Yes, it has commonly used in several public-private partnerships projects.

5. Innovative financial tools for CSO's energy efficiency projects

Many studies and reports have identified the various barriers to implement energy efficiency, which may also be significantly relevant for CSO projects. In general those barriers can be classified into:

- Barriers related to policy and regulation;
- Barriers related to energy end users;
- Barriers related to providers of energy-using equipment and services
- Barriers related to finance

Among those barriers, lack of financial support is the most problematic one. While most of the commercial banks and private investors are reluctant to invest in energy efficiency project, most of financial institutions lack core knowledge on energy efficiency and perceive energy efficiency projects as a high risk and uncertainty investments. Although, in reality financing energy efficiency may not appear to be much different than financing other projects, certain characteristics of energy efficiency projects may hinder the strong involvement from financial institutions. One of the main obstacles is the complexity of technology in energy efficiency that creates a knowledge gap between the organisation developing an energy efficiency project, the beneficiaries, and the financial institutions. Moreover, the average size of an energy efficiency project is relatively small compared to other typical infrastructure project loans. As a result, that obstacle makes energy efficiency less attractive to financial institutions. Overall, those barriers limit the development of energy efficiency initiatives such as CSO housing construction and retrofitting.

In overcoming those barriers, government and international financial institutions have been designing programmes and tools to mobilize financing support for CSO energy efficiency projects. We collected several financial tools that have been applied in several countries and have been effectively used in supporting CSO projects. The table below presents practical information regarding the financial tools for CSO projects.

Country	Name of programme	Short description of the programme	Type of financial tools	Targeted projects
Germany	KfW Energy-efficient Construction ("Energieeffizientes Bauen")	The KfW bank provides funding for new buildings which surpass the applicable building standard: KfW Energy-Efficient House 70, 55 and 40, and the Passive House Standard. EUR 50 000 is the maximum amount of funding provided per housing unit, which corresponds to a maximum of 100 % of the eligible costs. The funding is provided through long-term soft loans.	Loan	New construction
	Tax incentives for Energy renovations	This financial tool aims for retrofitting projects. The project receive tax discounts for energy renovation of residential buildings which go beyond the requirements of the Energy Saving Ordinance (Energieeinsparverordnung). Through this program, projects such as the enhancement of energy efficiency building and the deployment of renewable heating in the residential buildings will be supported.	Fiscal incentive	Retrofitting
	Replenishment of the KfW programmes for energyefficient construction and renovation (Aufstockung KfW-Gebäudeprogramme)	The KfW promotional bank offers either a loan or grant to promote energy efficient in new construction and retrofitting. In order to receive the support, projects should meet the energy standards for new buildings that are laid out in the Energy Conservation Ordinance (Energiesparverordnung/EnEV).	Grant and loan	New construction and retrofitting
Hungary	Energy efficient renovation of residential buildings built	The objective of the grant is the renewal of residential buildings with technology resulting energy saving as well as the modernisation and renovation of the systems, equipment of these residential buildings together with building facilities. The extent of the claimed state subsidy is maximum one third of the value of the investment but maximum HUF 400 000 per dwelling/flat.	Grant	Retrofitting
	"Our Home" Renovation Programme	The targeted users of the support are in residential buildings which are not built by industrialised technologies, multi-occupied residential buildings and family homes. The support comprises complex investments in existing buildings (mainly constructed by traditional technologies) with individual or central heating: insulation, substitution of doors and windows, renovation of heat production (boilers), application of renewable energy production (heat pumps or solar panels).	Grant	Retrofitting
The Netherlands	Innovation Agenda for the Built Environment (Innovatieagenda energie gebouwde omgeving)	The innovation Agenda for the Built Environment encourages innovations and aims to halve energy-use in the built environment in 2030. There are many different alternative that can be used to finance energy efficiency projects. However, one of the mean is to use a company called Energiesprong. The company has brokered a deal between housing associations and builders to refurbish 111,000 houses in the Netherlands.	Public private partnership, Grant and loan	Retrofitting

Country	Name of programme	Short description of the programme	Type of financial tools	Targeted projects
Norway	Local energy efficiency (Enøkfondet i Oslo)	The fund gives grants and loans to energy efficiency measures in buildings in Oslo that contributes to a more energy efficient use of electricity, oil or other energy sources. The grant is normally approx. 20% of the investment cost and it is also possible to get a loan to fully finance the investment. The grant is up to 50 % for major investments (boiler, solar systems, district heating, heat pump replacing oil boiler etc).	Grant and loan	Retrofitting
	Energy saving loans (Husbanken)	As the main implementing agency for the Norwegian Government's housing policy, the Norwegian State Housing bank provide renovation loan for existing house and their facilities. Its primary goal is to ensure that all people live in satisfactory homes in good housing environments.	Grant and loan	Retrofitting
United Kingdom	Energy saving trust	Energy saving trust provides support for promoting energy efficiency across the household sector in the UK. They have offices in England, Scotland, Northern Ireland and Wales and their aim is to cut emissions of carbon dioxide (CO2) by promoting the sustainable and efficient use of energy.	Grant and loan	New construction and retrofitting
Belgium	Energy grant for households – Brussel region and financial incentive for energy saving investment in buildings – Wallonia region	The grant targets energy efficient saving in residential buildings. However, the amount of grants depends on income and where the investment is carried out.	Grant	New construction and retrofitting
	Develop and promote exemplary buildings - BATEX (with virtually zero consumption and of high environmental quality) in the residential sector	The call for projects is open to all users who build or renovate in Brussels from small (approx. 120 m2) or large (approx.. 10 000 m2 of even more) building projects. Each applicant project undergoes serious technical analysis by external experts before being presented to a jury, which selects projects on the basis of criteria relating to energy performance, environmental quality (water management, ecological materials, etc.), technical reproducibility, viability or cost-effectiveness and the philosophy, visibility and architectural quality of the project.	Grant	New construction
France	Alternative financing of sustainable building renovation (social green loan, third party investor, FRCE)	The government has entered into a partnership with the alternative credit union and financial institutions to make an interest-free loan available to Brussels households.	Public-private partnership Grant and loan	Retrofitting
	Zero-rated eco-loan	Zero-rated eco-loans are available for users to implement energy efficiency projects.	Loan	Retrofitting

Country	Name of programme	Short description of the programme	Type of financial tools	Targeted projects
Ireland	Better Energy: Homes (Residential Retrofit)	The purpose of this program is to stimulate energy-efficiency actions to reduce energy usage by homeowners and the general public. The Sustainable Energy Authority of Ireland (SEAI) grant-aids householders who want to make their homes more energy-efficient by providing incentives towards the implementation of energy efficiency measures	Grant	Retrofitting
Sweden	Programme for buildings with very low energy use (LÅGAN)	The Swedish Energy Agency has granted the Swedish Construction Federation (Sveriges Bygginstitut), a programme for the development of buildings with very low energy use. The purpose is to promote energy efficient new construction and renovation. The energy use of the projects has to be at least 50 % lower than the present requirements for buildings and the projects are required to have significant demonstration value.	Grant	New construction and retrofitting
Czech	Green Savings Programme	The Green Savings Programme focuses on support for heating installations utilizing renewable energy sources but also investment in energy savings in reconstructions and new buildings.	Grant and loan	New construction and retrofitting

5.1 Alternative financial tools for CSO energy efficiency projects

From data that we have previously collected, we found that most of the financial tools that are available for financing CSO projects provided by government or European financial institutions. In this approach, the government play a major role by taking over a whole or partial risk of the investment set the direction, criteria, and requirements. Besides the top-down approach of financing CSO projects, our study identified several innovative models as described below:

Public-private partnerships approach for CSO energy efficiency projects

Public-private partnerships (PPPs) have been seen as an alternative that shows a great success in attracting private financing to energy efficiency investments. PPPs is a government service or private business venture that is funded and operated through a partnership of government and one or more private-sector companies. PPPs generally involve a contract between a public agency and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project. In some types of PPPs, the cost of using the service is borne exclusively by the users of the service. In other types, capital investment is made by the private sector based on a contract with a government agency to provide agreed services. The PPPs have the advantage of promoting rapid implementation of projects without burdening public finances and can provide better value for money for the public sector. It allows the state or local authorities to involve a private enterprise in both the financing and management of the project.

In energy efficiency, the partnering of the government with local financial institutions (LFIs) and energy services companies (ESCOs) enables the structuring of PPPs to deliver market-oriented instruments that target specific market barriers, without the need for direct government subsidy programmes. It also allows governments to achieve their

targets with only a fraction of the public funding that would otherwise be required, with the private sector taking on both the financial and performance risks.

Example: The commercialising Energy Efficiency Finance (CEEF) programme

The programme was launched in 2003 as a joint programme of the International Finance Corporation (IFC) and Global Environment Facility (GEF), with IFC acting as the executing agent for the GEF. CEEF was initiated, based on the experience from the “Hungarian Energy Efficiency Co-Financing Program” (HEECP). The countries included in CEEF were the Czech Republic, Slovakia, Estonia, Latvia, and Lithuania. The CEEF worked in partnership with local financial institutions (local banks and investors) by providing partial guarantees to share in the credit risk of energy efficiency loan transactions. The transactions eligible for the programme included capital investments aimed at improving energy efficiency in buildings, industrial processes, and other energy end-use applications. Several projects targeted by CEEF included energy efficiency investment projects by small enterprises, street lighting projects by small towns and villages, and replacement of outdated heating technologies in hospitals.

Crowdfunding for CSO energy efficiency projects

Crowdfunding is the collective effort of many individuals who pool their resources to support efforts initiated by other people or organizations. This is usually done via or with the help of the Internet. Individual projects and businesses are financed with small contributions from a large number of people, allowing innovators, entrepreneurs and business owners to utilize their social networks to raise capital. The term crowdfunding is derived from the better known term crowdsourcing, which describes the process of outsourcing tasks to a large, often anonymous number of individuals, a crowd of people and drawing on their assets, resources, knowledge or expertise. In the case of crowdfunding, the objective is to obtain resources.

Currently, there are many models of crowdfunding. Crowdfunding can be divided into not-for-profit and for-profit. For not-for-profit crowdfunding, the project is intended to be non-profit with societally important goals for instance in the area of public health care, public infrastructure, general charity, etc. For profit crowdfunding, the initiative pursues clearly commercial (for-profit) goals like setting-up a company, funding a commercial project within an existing company, etc. Crowdfunding can also be identified through the background of the initiators. For instance, the initiators can be an independent individual with no affiliation to institutions or organisations. Crowdfunding can also be used by start-ups. These are projects that may start as independent ones but are intend to lead to the foundation of an organisation (private or public). In some cases, crowdfunding can also be initiated by or from within an incumbent private or public organisation (e.g. a company, an NGO, a consortium of project partners, an authority, a supranational organisation like the EU Commission or UN). The following example of crowdfunding platform can be used by CSO to seek financial support for their projects.

Example: Bettervest, Germany (www.bettervest.de)

Bettervest is the first equity-based crowdfunding platform for energy-efficiency projects which lets the crowd participate in the savings generated by reducing energy consumption. By comparing the resulting improved energy costs with the original costs, the overall savings are calculated. Each project must be analyzed and calculated by an energy efficiency consultant. Small investments (50-10.000 Euros) from a large group of crowd investors are collected on an escrow account until the investment volume of the project is reached and the energy-efficiency measures can be realized. A defined percentage of the savings is distributed to the crowd. In 2015, Bettervest started their first project in Africa. The growing interest in sustainable investments favours the Bettervest model. For example, in Germany, Austria and Switzerland the market for sustainable investments is growing by an annual average of 26% since 2004 and covers fixed assets of over 134 billion Euros (Forum Nachhaltige Geldanlage e.V. 2014). Until now Bettervest has realised projects between 5,250 Euros and 385,150 Euros.

Example: Spacehive, UK (www.spacehive.com)

Spacehive is the world's first crowdfunding platform for civic projects. It allows individuals and communities to raise donations online for a wide range of local projects. Spacehive empowers citizens to develop and back projects they want realized in their communities. Big Society Capital has taken an equity stake in Spacehive, investing £600k to grow the business. Big Society Capital was matched in its investment into Spacehive by Belgian Social Investment fund, SI2 Fund, as well as a handful of other private individuals. Spacehive acts as a catalytic part of market infrastructure, allowing charities and community groups to access non-repayable finance cheaply and easily. The donations gathered through the platform allow these groups to get off the ground, delivering locally significant projects and impact on the ground. Some of these groups may expand and go on to seek out social investment in future to complete further, more complex projects in their localities.

Example: Abundance Generation, UK (www.abundancegeneration.com)

Abundance Generation launched in 2011 as a way for small investors to put money into UK renewable energy schemes and receive a share of the profits from the energy produced. Describing itself as a 'community finance platform', it represents a variant of the crowdfunding model, putting investors in touch with community groups and companies that want to build environmental projects. Abundance Generation collects the money and organises the payouts in return for a 1.9 % fee paid by the body that builds and operates the project. Individuals can invest as little as £5, or as much as £50,000, to buy debentures in a particular project. In Brussels, a similar model – Green Crowding – has attracted attention from the Commission and was featured in a short film for this year's EU Sustainable Energy Week.

6. Conclusions

The study focuses on identifying current and alternative financial tools for collective self-organised (CSO) housing construction and retrofitting projects. Based on collected data of financial tools, the potential investment for CSO projects can be mapped based on the leading role of their stakeholders which has an implication on the type of funding.

Delivery models	Approach in financing the project	Examples
Public-led	Top-down approach	Loan and credit agreements
Market-led	Public-private partnerships	Contract agreement
Community-led	Top-down approach Public-private partnerships Crowdfunding	Loan and credit agreements Cooperative and crowdfunding

Understanding the options and opportunities for financing is critical to the delivery of successful energy efficiency projects. Depending on the delivery models, projects can be financed differently. In top-down approach, the government usually sets the rules and plays a leading role while in the public-partner partnerships, private companies or community may have a quite significant role and share the risk of investment. In addition, an emerging information technology has offered a new way of financing CSO projects such as crowdfunding. In energy efficiency projects, the use of crowdfunding is growing fast. In 2012 crowdfunding in Europe saw an estimated 65% growth compared to 2011 and reached €735 million. This figure is promising compared to the shrinking European venture capital market of €3 billion, although modest compared to the European initial public offering markets (in the range of €16.5 billion). In terms of energy efficiency, crowdfunding offers several benefits, including finance to small business and community organizations, speed in mobilizing funding and risk-taking.

Realising there are many financial tools that are available for CSO project, this study also noticed that there is a need to improve the lack of information and best practice of the impact of those tools for supporting CSO housing constructing and retrofitting projects. While there is a wide range of financial tools that have been implemented in Europe, each country has set up different mechanism, regulations and context which make it difficult to compare and study the performance of financial tools systematically. Moreover, after showcasing several financial tools, the study recommends several points that need to be considered in the effort of financing CSO energy efficiency projects.

There is no ‘one solution fits all’ approach but a more structured and comprehensive approach is needed to combine the different tools and adapt them to the national or regional specificities and to the needs of the different market segments

We suggest that CSO project may benefit from a combination of different financial tools and approach is the most effective ways of achieving and implementing energy efficiency. In this case, policy makers (government) should provide some supports to overcome the lack of information on best practices and resources available for CSO.

The public sector needs to act as first movers in promoting energy efficiency through financial tools but they have to involve a wide range of partners including community at large such as in CSO projects.

Many of successful projects in energy efficiency relied on the public sector as a first-movers by providing grants, funding, and subsidies. However, the effectiveness of their support needs to be strengthened by the participation of a wider community through public-private partnership and community involvement.

In more practical way, there are several recommendations for financing CSO projects:

Supports are available through local, national and EU-wide schemes to help with project assistance, energy audits, and the preparation of tendering procedures and contractual arrangements.

There are many source of funding (as we have presented in this study). However, the source of information are well-maintained. Small organisations such as CSO may struggle to gather the information related to financing due to their limited resources and complexity of the information.

As the bank is unlikely to offer full financing of either the site purchase or the development, CSO projects should actively seek support from other source of funding and ‘*think outside the box*’.

Apart from government grants and loans (top-down approach), CSO projects need to consider different alternative of supporting the project. For instance, co-operative model or crowd funding mechanism may offer a new and innovative way of generating investment.

Different financing mechanisms can be deployed and blended together (e.g. grants and loans) depending on the objectives and needs of the projects.

Sometimes grant or loan target specific energy efficiency measurement such electricity, heating, etc. CSOs may consider to combine several source of financing to cover their needs of investment.

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