NewTREND
NEW Integrated Methodology and Tools for Retrofit Design Towards a Next Generation of ENergy Efficient and Sustainable Buildings and Districts

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NEW INTEGRATED METHODOLOGY AND TOOLS FOR RETROFIT DESIGN TOWARDS A NEXT GENERATION OF ENERGY EFFICIENT AND SUSTAINABLE BUILDINGS AND DISTRICTS

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ABBREVIATIONS AND ACRONYMS

ACRONYM	DEFINITION
ACORE	American Council On Renewable Energy
ADB	Asian Development Bank
AFD	Agence Francaise de Developpement (French)
CDP	Cassa Depositi e Prestiti (Italian)
CEB	Council of Europe Bank
CfD	Contracts for Difference
CoE	Council of Europe
DH	District Heating
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EE	Energy Efficiency
EEFIG	Energy Efficiency Financial Institutions Group
EIB/BEI	European Investment Bank/ Banque Européenne d'Investissement
EPC/ESC	Energy Performance Contract/Energy Service Contract
ERDF	European Regional Development Fund
ESCO	Energy Service Company
EU	European Union
EUFORES	European Forum for Renewable Energy Sources
FI	Financial Institutions
FiT	Feed in Tariffs
GSE	Gestore Servizi Energetici (Italian)
IDB	Inter-American Development Bank
IEA	International Energy Agency
IFC	International Financial Corporation
IFI	International Financial Institutions
KfW	Kreditanstalt für Wiederaufbau (German)
NATO	North Atlantic Treaty Organization
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
P2PL	Peer-to-Peer Lending
PE	Private Equity
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PV	Photovoltaic
RE	Renewable Energy
REC/REO	Renewable Energy Certificates/Renewable Energy Obligations
RES	Renewable Energy Sources
SME	Small-Medium Enterprise
UN	United Nations
VC	Venture Capital
WP	Work Package
NOTE:	***Acronyms introduced between parenthesis soon after the definition they represent and not used outside of the same paragraph, as well as unit of measures and currencies three-letters indicators, are not reported here.***

1. INTRODUCTION AND SUMMARY

1.1. EXECUTIVE SUMMARY

This document presents a review of the various financing and business models available for energy efficient renovations at the scale of individual buildings and small neighbourhoods. The main focus is upon the New Trend case study countries of Hungary, Finland and Spain, but the review takes in relevant information and case studies from other countries, in the EU and elsewhere, as appropriate. The study reflects information available in 2016. The purpose is to provide a general resource for understanding the range of financial solutions available for retrofitting as well as a specific basis for developing the data library and software templates involved in subsequent New Trend work package tasks.

In total, eight categories of financing mechanisms have been reviewed in terms of their structures, applicability, scope and constraints. These included loans and loan guarantees, grants, inter-regional initiatives, energy performance contracting, utility and community initiatives, tax incentives, securitisation, crowd-funding and peer-to-peer lending. Of these, loans and loan guarantees appeared to be the most extensively used, followed by grants.

Both energy efficient lending and EU-wide initiatives, however, are still mainly restricted to large players and public institutions. At the same time crowdfunding and community funding, which could have a strong potential for smaller projects/individual owners, suffer from under-awareness, early stage inexperience and, as a consequence, have been underutilized. Other indirect mechanisms that would be beneficial, such as on-bill financing or tax incentives, suffer from a lack of clarity, and with securitization only recently emerging for large scale renewable generation, it has yet to offer substantial bundles of energy efficiency schemes to institutional and equity investors. For medium/large interventions, an attractive solution is represented by energy performance contracting through the ESCO model, despite the complexity of the contractual arrangements involved.

Finally, utilities are positioning themselves to play a greater facilitating role as a result of regulations requiring them to offer more energy efficient solutions, smart metering, demand-response and flexible grids. Evidently, making it easier and profitable for end-users who generate and inject renewable energy into the distribution networks will clearly make a difference to the economics of energy efficient retrofitting that incorporates renewable energy sources. These opportunities in turn help to foster community funding initiatives and greater engagement in energy efficiency generally.

The most substantial part of this report is a compilation that summarises in a standard template form, over 50 case studies of financing and business models. This is a key resource for the New Trend platform development.

1.2. PURPOSE AND STRUCTURE OF THE DOCUMENT

This report provides a review of the scope, applicability and constraints of the various financing and business models available for district-scale, energy efficient renovations. The purpose was to synthesise what is known about the various financing mechanisms and their relevance to EU retrofitting projects. We expect this to be a valuable reference document for project participants. It is also a key part of the New Trend software development and data Library. This report is intended to provide the basis for the software specification and data resources in subsequent work packages and tasks of New Trend, most directly feeding into the follow-up report D5.2 on Software Features for Gaining Financial Support.

Section 2 below briefly outlines the organization of the research, accompanied by a glossary of relevant terms. Chapters 3-10 present the main EU financing mechanisms and business models, whilst chapter 11 presents some extra-European examples. In each chapter we describe the business and financing product, its functioning, eligibility conditions and scope of support. Finally, chapter 12 concludes with some critical guidelines.

2. ORGANIZATION OF THE RESEARCH

The research for this work package task (WP 5.1) has been carried out between September 2015 and September 2016. It constructs a body of knowledge to inform users of the NewTREND platform on the most appropriate financing mechanisms and business models available for their selected locations, projects, district and building features of intervention. The underpinning idea is to have, in parallel with the energy saving information relative to the simulated interventions, a link to viable business models.

Thus, WP 5.1 focused mainly, but not exclusively, on the countries containing NewTREND case studies, i.e. Hungary, Finland and Spain. Wider considerations of schemes in Italy, UK, Germany and France as well as some other EU and non-EU mechanisms were included to provide a more complete perspective of current practice and potential initiatives.

The compilation undertaken in NewTREND WP5.1 has been organised into 8 main categories of financing mechanisms, and business models differing by geographical scope (National, European or Non-EU), operational process (direct vs intermediated), and financing structure (repayment/grant schemes, contractual agreements, embedded incentives or tradable instruments).

The research was progressed in 4 main stages:

1. Initial broad compilation of information from public sources and relevant databases (e.g. EU, IEA, OECD, industry portals, research organisations, etc.).
2. Information screening and selection, with the key selection criteria being: alignment of scope with NewTrend (i.e. single buildings and small neighbourhoods), validity, relevance, availability and clarity of information.
3. More detailed research on the screened pool of financing mechanisms and business models, with cases study examples documented into standard template presentations.
4. Drafting of this final report summarizing the status of the financing and business models in the EU and elsewhere, their differences, pros and cons and indicative conclusions.

The workload was shared between the consortium partners involved: partners having man-hours assigned to D5.1 took assigned parts in stages 1-3 and partners without man-hours provided further insights under general internal review at stage 4. Assigned partners have contributed with examples from their country/sector of expertise (e.g. REGENERA has researched ESCOs in Spain and rest of Europe, whilst GO has provided financing mechanisms for Finland) and other partners (e.g. Hungary) have provided links and brief explanations concerning relevant schemes in their respective countries. The glossary displayed in section 2.1 below has been provided as a reference for a basic understanding of financing mechanisms.

2.1. GLOSSARY

TYPOLOGY	
ALTERNATIVE INVESTMENT FINANCE ("alternatives")	An alternative investment is an investment in asset classes other than stocks, bonds, and cash. The term is a relatively loose one and includes: - tangible assets spanning from precious metals to coins/stamps - financial assets such as real estate, commodities, carbon credits and other climate/energy securities, private equity/hedge funds/venture capital (PE/HF/VC), and other derivatives. As with property mortgages, securitisation (creation of complex tradeable securities) has been attempted with energy efficiency/renewable energy investments. Securities created from these investments will be classed as 'alternatives' and will usually present quite different risk-return profiles to traditional securities and it that respect may be attractive to diversified portfolio investors.
BONDS	A bond is a type of debt security under which the sellers/issuer owes the holders/buyers a debt and, depending on the terms of the bond, is obliged to pay them an interest (coupon) at fixed intervals and/or the return of the principal (debt) at maturity date. Very often the ownership of the bond can be tradeable in the secondary market. Being a debt instrument, a bond is a form of loan whereby the holder is the lender (creditor), and the issuer is the borrower (debtor): bonds provide the borrower with funds to finance long-term investments, or current expenditure. In case of bankruptcy, bondholders have priority over stockholders, meaning that they will be repaid in advance of stockholders, but later than "secured" creditors. Bonds can be issued by public institutions (public bonds), corporates (corporate bond), local entities (municipal bonds) and other organisations. "Green" bonds are becoming evident as mechanisms for raising capital secured against an income stream from renewable energy production.
CO-INVESTMENT	An equity co-investment is a minority investment, made directly into a project/ company, by a financial institution (FI) or by a private equity (PE) subject, alongside another FI or PE subject, in a specific transaction (e.g. project finance, buyout, recapitalization). In certain circumstances, venture capital lenders (VC) may also seek co-investors. Co-investments allow larger investments with distributed (hence reduced)

TYPOLOGY	
CO-INVESTMENT	exposure to risk and decrease competition in favour of cooperation: co-investors bring a friendly source of capital. Co-investments can be arranged: - **between public and private partners (see also PPP);** - **between public partners only;** - **between private partners only.** Unlike limited partnership, co-investments are made outside of existing funds therefore co-investors rarely pay management fees or carry interest on an individual investment: co-investments are typically passive, non-controlling investments, with the co-investors mainly exercising monitoring functions. In the PE sector, co-investments are a means of investing in higher return opportunities and are usually offered by PE firms to their largest and most important investors as an incentive to invest in future funds.
COMMUNITY FUNDING (CFs)	Community funding is any form of financing given by FIs (financial institutions), the government, community foundations (CFs) or other private lenders, in the form of grants or loans, to non-profit entities (such as charities) serving a specific community (county, region or other geographical/social group). Community foundations (CFs) are independent registered philanthropic institutions serving geographically defined territory, typically a city or administrative area; they are designed to pool donations and to intercept funding in order to invest in the social improvement of a given place or of a given group. Main characteristics of CFs are: - grant-making – they give grants to support development projects - defined mission on a specific target (social/geographical) – usually to improve quality of life for the specific target - supported by donors, mainly within the community - governed by boards reflecting the community They can be non-endowed (aka expendable funds), if the body of the fund can be spent entirely, or endowed, if the body of the fund remains untouched and distributions limit to interests earned on assets and to external grants received.
CONTRACTS FOR DIFFERENCE (CfDs)	A contract for difference (CfD) is a financial derivative in which a seller will pay the buyer the difference between the current value of an asset and its value at

TYPOLOGY	
	contract time (or vice versa, if the difference is negative). For energy production, Contract for Differences (CfD) are alternatives to FiTs as they remove price risk, but they do require the producer to sell the production into the market. They require the prior definition of a strike price (which is what both parties aim to secure) and a reference price in the market (e.g. the daily average). The compensation is then the difference between the two. Evidently this is a financial hedge and the actual physical trading of the two parties may occur differently.
CROWDFUNDING	Crowdfunding is the practice of funding a project or venture by raising monetary contributions from a large number of people, today often performed via internet-mediated registries, but the concept can also be executed through mail-order subscriptions, benefit events, and other methods. Crowdfunding is a form of alternative finance, which has emerged outside of the traditional financial system. The crowdfunding model is based on three types of actors: - the project initiator who proposes the idea and/or project to be funded; - individuals or groups who support the idea; - a moderating organization (the "platform") bringing the parties together to launch the idea. There are two primary types of crowdfunding: - rewards crowdfunding: the product/service is pre-sold as a reward for the funders - equity crowdfunding: the funders receive shares of the company.
DEMAND RESPONSE MECHANISMS	Demand response is the technology-enabled voluntary adjustment of consumption of a service utility such as electricity or gas to financial signals by the utility retailer. It may be more economic to incentivise customers to adjust consumption than alter production. This demand response could be up or down depending upon the needs of the utility. Often large industrial and commercial users offer this facility to help in scarcity conditions, but with the advent of smart meters, explicit requests or price changes can be communicated to customers and even automatic building control action can be programmed.

TYPOLOGY	
ENERGY PERFORMANCE CONTRACTING (EPC), ENERGY SERVICE COMPANY (ESCO)	Energy Performance Contracting (EPC) is a form of financing allowing capital/upgrades from cost reductions. Under an EPC arrangement an Energy Supply Company (ESCO) implements a project to deliver a performance/cost reduction result, using the stream of income from the performance granted or from the differential between previous and present costs (that is from the cost savings) to repay project and investment costs. Essentially, an ESCO will not receive its payment unless the project delivers the expected performance/savings, hence carrying entirely the technical risk through performance guarantees. EPC is therefore a means to deliver complex interventions in situations where the multi-stakeholder nature of the project generates a lack in either skills, manpower, capital funding, or capacity that would undermine the project's feasibility/bankability. EPC can operate under several financing models: - guaranteed savings/shared savings: the guarantee lies in the energy performance / the guarantee lies in the cost of energy savings - first-out approach: the ESCO is paid 100 % of the energy savings until project costs and profits are fully paid; - chauffage contract: ESCO takes over complete responsibility for the provision of an agreed set of services and sometimes also full responsibility for related supplies (e.g. energy purchases). Under such arrangement, customer pays the ESCO a fee normally equal to 90-95% of its previous bills for the same service; - BOOT (build-own-operate-transfer) contract: the ESCO designs, builds, finances, owns and operates the equipment/service for a defined period of time, through a special purpose enterprise, acting as a long-term supplier to the customer and transferring ownership across at the end of the contract; - capital/operating leasing contract: in capital lease, the lessee (customer) owns and pays the ESCO for its service with the cost savings, the ESCO in turn arranges a lease/purchase agreement with a financing institution; in operating lease, the ESCO rents the service to the lessee (customer) for a fee in an off-balance sheet operation, shifting the risk away from the customer and claiming tax benefits associated with depreciation. Under a guaranteed savings contract, the ESCO carries the entire performance and project risk; the FI assumes the credit risk and the customer assumes the repayment risk: when savings fall short in servicing debt, the ESCO has to cover the difference, whereas when savings exceed debt service, an agreed upon percentage of the excess goes back to the ESCO. A contract normally also contains a threshold level of energy price below which the guarantee is null or may present the variation of a repayment schedule based on the level of savings.

TYPOLOGY	
ENERGY PERFORMANCE CONTRACTING (EPC), ENERGY SERVICE COMPANY (ESCO)	Under a shared savings the client takes some performance risk, the FI and the ESCO share credit risk (through TPF or with other mixed scheme), and the ESCO assumes repayment risk. The ESCO collateralizes the loan with anticipated savings payments from the customer, based on a share of the energy cost savings and enters the financing in its balance sheet. The main risk to account for is the ESCO attempting to lower savings' estimates and to capitalize from 'excess savings' whereas pricing risk is addressed by fixing the contract's energy price. Chauffage contracts give the strongest incentive to ESCOs to provide services in an efficient way and may combine shared savings and guaranteed savings, whereby all savings up to an agreed figure would go to the ESCO to repay project costs and profit. Chauffage contracts are typically very long (20-30 years), with the ESCO providing maintenance and operations during the contract. Leasing can be an attractive alternative to borrowing because the lease payments tend to be lower than the loan payments.
FEED-in-TARIFFS (FiTs)	A feed-in tariff (FIT, standard offer contract) is an incentivising policy offering long-term purchase contracts (hence compensation certainty) to producers for the energy generated, based on the cost of generation of each technology, favouring specific investments by decreasing their risk; the FiT structure may decrease over time, following cost-based purchase prices, up to technology maturity. The goal of feed-in tariffs is to offer cost-based compensation to energy producers, providing price certainty and long-term contracts that help finance renewable energy investments.
GRANTS	Grants are non-repayable funds or products disbursed by one party (often a government/public institution, corporation or foundation/trust), to a recipient (for example, a non-profit entity, a public institution, a business or an individual/consortium). In order to receive a grant, a specific proposal or formal application process is usually required. Most grants are made to fund a well-defined project and require: - a proposal/application submitted by the proposed recipient to the funder (on its own initiative or in response to a call), - a level of compliance and reporting (progress tracking).

TYPOLOGY	
GRANTS	Specific grants can be arranged: - at government policy level, for large infrastructural projects, in the form of ***tiered funding*** - at government agency level for smaller projects, as ***municipal/regional grants*** - to serve a very specific purpose through a one-off targeted project (e.g. a specific district renovation) as ***idiosyncratic grants*** Special grants may be selectively offered to: - individuals, such as victims of unfortunate events or specific social groups - entrepreneurs seeking to open a small business (SMEs) - organisations with specific tax-exempt status (e.g. not for profits, government institutions) or consortia. Grants at the EU level are provided by the EU Commission (EC) through numerous specific calls for project proposals, often grouped in Framework Programmes (7-years funding cycles) although there are also: - one-off grants dealing with unforeseen aspects or special themes - grants awarded by the Council of Europe (CoE, separate from the EC) through specific calls/projects.
GREEN CERTIFICATES	Green Certificates (aka Renewable Energy Certificates, RECs in the USA, or Renewable Energy Obligations, ROCs in the UK) are tradable certificates proving that a specific amount of electricity (typically 1 MWh) is generated using renewable energy sources. Sources considered as renewable are usually wind, solar (PV and thermal), wave and tidal, geothermal, hydro and biomass (mainly biofuels). Green Certificates are usually combined with an obligation to embed a certain annual quota of renewable energy production/utilisation in the energy mix and with levies for the unmet part of the quota. Because the obligation is on the retailers, this creates a demand and hence a market for the green certificates created by the generators. Green certificates represent the environmental value of renewable energy generated and are traded separately from the energy produced (creating a certificate market separate from the electricity market). Green certificates are meant to convert support of green electricity generation into a market economy (as opposed to rely on external financing) and are used by EU countries (Poland, Sweden, UK, IT, BE) and by some US states. Green certificates can only be traded on a national basis, and cannot be exchanged between states.

TYPOLOGY	
GREEN CERTIFICATES	Usually, Green Certificates are issued by a national administrator (e.g. OFGEM in the UK, GSE in Italy) to renewable energy producers, and are purchased by utilities that use them to offset generation levies. Purchasing a green certificate equates to purchasing a claim that the owner consumed energy from the renewable portion of the whole energy in the grid, undepending on how much renewable energy was actually generated.
INTERREGIONAL ORGANIZATION INCENTIVES	Financing organised by organizations operating in several geographies/states, such as: - international financial institutions (or IFIs, for example development banks) - international organizations (e.g. UN in its many sub-committees, NATO) through cooperation with IFIs - international councils/NGOs (e.g. US-based ACORE or EU-based EUFORES) through cooperation with IFIs
LOAN GUARANTEES	A loan guarantee is a promise by one guarantor to **assume a debt obligation in case of a borrower default**. Loan guarantees **decrease lending risk**, increasing project bankability (investors' confidence and will to invest in the project). Most loan guarantee programs are **established to correct perceived market failures** by which small borrowers or emerging technologies lack access to the credit resources normally available to their more established counterparts (large corporations or consolidated technologies). Loan guarantees **can also be extended** to large borrowers **for political reasons**, to respond to economic or political crises. Depending on the level of guarantor liability, the guarantee can be **limited** (liability for a portion) or **unlimited** (liability for the entire loan).
LOANS	Loans involve the lending of money in the form of debt, provided by an institution/entity to another subject institution/entity or individual/business at a cost. It entails a temporary reallocation of asset(s) from the lender to the borrower. A loan is evidenced by a contract (promissory note) with main specifications being: 1. the amount of money borrowed, or **principal**; 2. the cost of lending (opportunity cost and risk coverage), in the form of **interest rate**; 3. the **date of repayment** and **debt servicing structure** (timeline of repayment); 4. additional restrictions and requirements, or **covenants**.

TYPOLOGY	
LOANS	A loan can be: - **secured/unsecured:** the borrower offers some asset as collateral (e.g. a mortgage is a secured loan offering the building purchased as collateral); unsecured loans (e.g. credit card debt, overdrafts, personal loans, lines of credit) do not offer any collateral and have therefore different risk/pricing/duration features; - **direct/indirect:** direct loans are awarded directly to final users, whereas indirect loans use financial intermediaries (e.g. dealerships) between financial institutions (FIs) and end borrowers; - **demand:** short term loans without fixed payment dates and interest rate variable (i.e. floating) according to the prime lending rate; they can be "called" for repayment at any time; - **subsidized/concessional (soft loan):** subsidized loans carry a reduced interest/no interest due to an explicit or hidden subsidy; concessional loan have more-generous-than-market terms such as low interest rates, long grace periods or a combination of both and are generally offered for development purposes or as a benefit. Depending on the borrower, loan can also be **personal** (consumer credit, based on credit score), **business** (commercial/corporate credit, based on credit rating) or **public** (public finance).
PEER-TO-PEER LENDING	Peer-to-peer lending (P2PL) is the practice of lending money to individuals or businesses through online services that directly match lenders with borrowers. Disintermediation and digitalization bring higher returns and lower interests (due to decreased costs) compared to traditional banking products. Whilst most peer-to-peer loans are unsecured, sometimes secured loans are granted by using material assets or valuables as a collateral. Loans can be granted to any kind of subject or company, with interest rates set by lender of by financial intermediaries on creditworthiness basis. In some cases the P2PL entity is backed by separate, ring-fenced fund, as a protection from borrower defaults. Compared to stock markets, peer-to-peer lending tends to have both less volatility and less liquidity.
SECURITIES	A security is a tradable financial asset.

TYPOLOGY	
SECURITIES	Securities are broadly categorized into: 1. debt securities, (e.g. banknotes, bonds and debentures) 2. equity securities, (e.g., common stocks) 3. derivatives (e.g., forwards, futures, options and swaps). Securities are created by stipulating a contract between a seller or issuer and a buyer or holder. Securities are qualified according and subject to a country's financial regulation authority. Securities may be represented by a certificate or and electronic "book entry" only form. Securities may be bearer, meaning they entitle the holder to rights under the security merely by holding the security, or registered. Securities that are actively traded in the capital markets are of particular interest to Institutional Investors who require regular price valuations and the opportunity to invest substantial amounts of capital. Energy assets that provide an income stream can be aggregated and "securitized" to become tradable and thereby release capital back to the developers.
WHITE CERTIFICATES	White certificates (aka Energy Savings Certificates, ESCs or Energy Efficiency Credits, EECs or white tag) are tradable documents certifying the property of a certain (attained) reduction of energy consumption, usually combined with an obligation to achieve a certain annual target of energy savings and with levies for unmet portions of the target. 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 delivery. White certificates are issued by a national administrator to energy producers whenever an amount of energy is saved; the producer can either use the certificate for its own target compliance or sell it to parties who cannot meet their targets. In theory, the tradability guarantees that overall energy savings are achieved at least cost by converting the support into a market economy, with certificates guaranteeing that the overall energy saving target is achieved.
YIELDCO	A YieldCo is a company that is formed with the specific purpose of owning operating assets that produce a predictable cash flow, primarily through long term contracts. Separating volatile activities (e.g. Development, R&D, construction) from stable cash flows can lower the cost of capital. Earnings from the predictable cash flows are used mainly to pay dividends to parent companies and other shareholders. Shares in the company are often sold more widely.

TYPOLOGY	
YIELDCO	Suited for utilities seeking to release cash from operational assets, YieldCos then give institutional and other investors a chance to participate in renewable energy whilst being protected against initial development risks. The number of YieldCos grew rapidly in 2013 and 2014 through initial public offerings. Most famous YieldCos are NextEra Energy Partners, TransAlta Renewables, Abengoa Yield PLC and the Terraforms (Sunedison's YeldCos).

3. LOANS AND LOAN GUARANTEES: NATIONAL AND REGIONAL

Loans involve the lending of money in the form of debt, which carries the obligations of a repayments schedule, interest charges and a liability for the borrower. A loan is generally secured by some form of asset (collateral), can use financial intermediaries between lender and borrower (indirect loan) and may be paired with a subsidy or grant reducing its cost (soft loan). Soft loans, covering 60-70% of the total investment costs often mean customers have to pay a reduced annual interest of around 2-3%.

A loan guarantee is a promise by a financial institution (guarantor) to assume the debt obligation, in case of borrower default. This increases the project's appeal to the lender and may thereby reduce the cost of lending. By providing access to credit, loan guarantees provide access to market for what might otherwise be assessed as a risky project (e.g. involving innovative technologies, small borrowers or large borrowers in crisis). In general loan guarantees cover around 60-80% of the loan.

For loans and loan guarantees, eligibility conditions are often less restrictive than for other financing instruments, as projects are assessed on a case-by-case basis (due diligence): access to credit depends therefore on type of intervention, ownership status of the building and creditworthiness of the borrower.

Within the countries covered in this research, soft loans feature as one of the three main sources of financing. Examples of loans and loan guarantees are listed in Section 3.1 following.

In Spain, the agency IDAE offered, through the program PAREER, loans paired with grants for a total of 125m EUR for energy retrofit measures such as envelope thermal retrofit, efficient lighting, and incorporation of renewable energy systems such as biomass, geothermal or solar thermal. These financings were given directly to owners of residential and hospitality buildings meeting the eligibility criteria (see 3.1.5).

Likewise, Finland is very active in lending to finance energy efficiency schemes. The Housing fund for Finland (ARA) promotes a soft loan scheme for the renovation of individual households with interventions such as audits, HVAC improvement, RES generation and general repair works. This is an intermediated loan, as the fund lends through financial institutions to housing associations, and it is paired with a loan guarantee covering up to 70% of the approved costs (3.1.1).

At a regional level (3.1.4), the company Municipality Finance provides soft loans to municipalities for interventions aimed at reducing GHGs and adapting to climate change (e.g. renewable energy, energy efficient construction/retrofitting).

Municipalities and other public entities (including the state) can also obtain soft loans for the so-called ‘life cycle projects’ (3.1.6), retrofits of schools/other centres undertaken by a PPP (public private partnership) of which the municipality is part, usually requiring that the life-cycle care is undertaken by the same body appointed for the retrofit.

Finally, for single industrial buildings, the financing company Finnvera provides loan guarantees for up to 80% of the credit sum to companies investing in renewable energy generation, process efficiency, environmental protection and waste recycling (3.1.2).

In Italy, on the other hand, the only institutionalised lending solution are the soft loans of the Kyoto Fund, launched in 2012 (OECD, 2012). Energy efficient financing is apparently not facilitated, with credit given at same conditions as for normal loans. Outside of that, energy efficiency lending is limited to transient local initiatives (by e.g. local banks) which however remain insignificant in the overall context.

Loans and loan guarantees are one of the most consolidated forms of energy efficiency financing, as their provisions and structures are derived from lending operations serving other forms of infrastructural lending (EEFIG report, 2015). Operated by financial intermediaries of small-to-medium scale, as well as by public institutions, their success is linked to their affordability (ability to sustain the project due diligence and the lending obligations). For this reason , many loans for innovative interventions such as energy efficiency retrofits are usually paired with either parallel creditworthiness enhancements in the form of default backups (loan guarantees) or grants (soft loan), in order to increase accessibility.

3.1 CASE STUDIES ON LOANS AND LOAN GUARANTEES

Instrument Name	**Country**	**ID**
Housing Fund of Finland (ARA) – Perusparannuksen lainoitus *Loans for renovations*	**Finland**	**3.1.1**
Instrument Type	**Direct/Indirect**	
Soft loan/loan guarantee	**Indirect**	

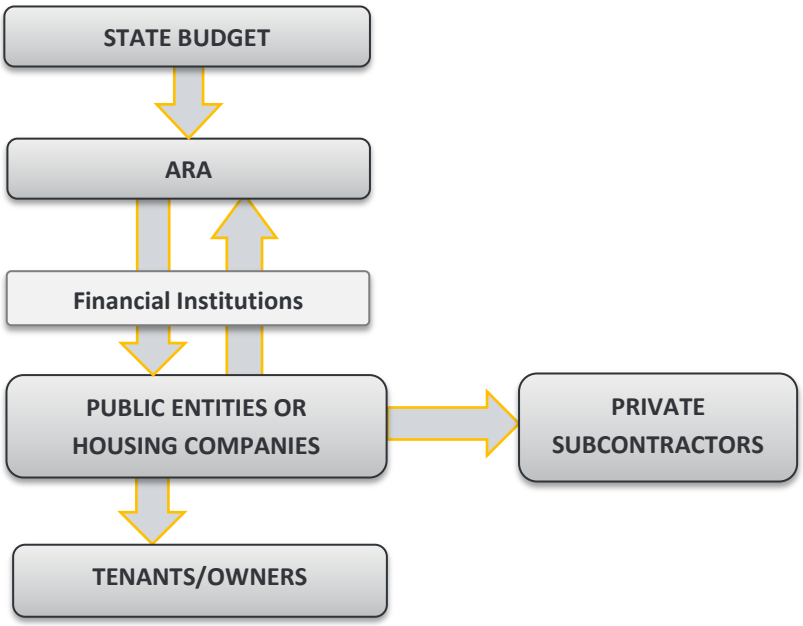
Instrument Scope

Subsidised loans (with reduced interest) for renovating rental apartment buildings and cooperative building society flats. Municipalities, other public communities, non-profit organisations and housing companies owned by one of the aforementioned parties can apply for the loan. Loan guarantees can be granted for renovating apartment buildings owned by a housing company.

Stakeholders

- **State –** providing the budget to ARA
- **Housing Finance and Development Centre (ARA) –** paying a part of the loans interests or offering loan guarantees
- **Financial Institutions** – administering the loans and the works payments
- **Public entities or housing companies –** receiving the loan and subcontracting the works
- **Private subcontracting entities –** carrying out the works
- **Tenants/owners –** carry some of the costs

Scheme



Description

Housing Fund of Finland (ARA) provides subsidised loans (with reduced interest) for renovating rental apartment buildings and cooperative building society flats. The loan is granted by a financial institution and ARA will pay a part of the interest.

Borrower's own contribution for the interest is 3.4 % in rental apartment buildings and 3.5 % in cooperative building society flats. The interest subsidy will get smaller every year. Municipalities, other public communities, non-profit organisations and housing companies owned by one of the aforementioned parties can apply for the soft loan.

Loan guarantees can be granted for renovating apartment buildings owned by a housing company. Loan guarantee can be granted for 70 % of the renovation costs (building(s) + supporting spaces, such as storages and laundry rooms). Loan guarantees are mainly targeted for renovations that are important in maintaining the building in good condition, such as pipe repairs, external repair works and renovations improving energy economy of the building. The borrower will pay a guarantee fee to the state (2 % of the loan capital).

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- Rental apartment buildings and cooperative building society flats: municipalities, other public communities and non-profit organisations can apply for the subsidised loan
- Apartment buildings owned by a housing company can apply for loan guarantee

Pros/Potential	Cons/Risks
• Encourages building owners to maintain their building over time. • It especially focuses on high capital cost improvements such as replacing the pipes and replacing the facades in old buildings.	

Relevant Documentation	Utilization / Availability Data
• http://www.ara.fi/fi-FI/Rahoitus/Perusparannuksen_lainoitus	

Instrument Name	Country	ID
Finnvera – Ympäristötakaus *Environmental loan guarantee*	**Finland**	**3.1.2**
Instrument Type	**Direct/Indirect**	
Loan guarantee	**Indirect**	

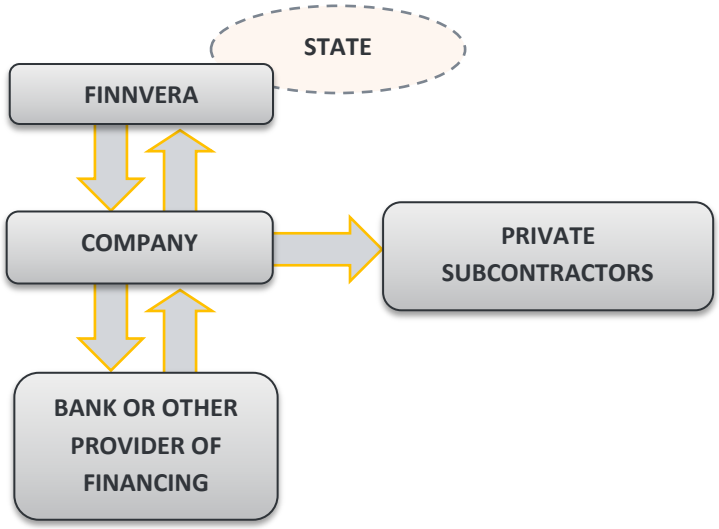
Instrument Scope

Environmental Guarantees can be granted as security for credits that are used for environmental protection investments, renewable energy projects or projects improving energy efficiency. Environmental Guarantee is mainly targeted for large companies.

Stakeholders

- **Finnvera –** providing the loan guarantee as security for credits received from banks and other providers of financing
- **Banks and other providers of financing –** financing the project
- **Company –** looking for funding and implementing the project
- **Private subcontracting entities –** carrying out the works
- **The State of Finland –** responsible for the guarantees granted by Finnvera.

Scheme



Description

Environmental Guarantees can be granted as security for credits that are used for environmental protection investments, renewable energy projects or projects improving energy efficiency. Environmental Guarantee is mainly targeted for large companies engaged in industry or in similar production. Suitable uses for guarantee are investments in Finland or investments carried out abroad but involving substantial improvements to the state of the Finnish environment. Finnvera's guarantee can cover at most 80 % of the credit sum.

Before a guarantee is granted, Finnvera must receive an expert's opinion of the feasibility and effectiveness of the project. In addition, for environmental protection investments carried out abroad, Finnvera obtains an opinion from the Ministry for Foreign Affairs concerning the feasibility of the investment.

The guarantee holder is required to pay an annual guarantee commission, the size of which depends on the enterprise's financial standing, the maturity of the guaranteed credit, and any countersecurity provided. A handling fee is also charged.

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- Large companies
- Possible projects
  - Water and air protection investments or waste recycling investments carried out in Finland
  - Investments promoting the use of renewable energy or energy efficiency in Finland
  - Modifications, repairs or improvements in the above energy projects
  - Investments carried out abroad but involving substantial improvements to the state of the Finnish environment.

The Guarantee **cannot** be granted for financing that is used to manufacture the devices in aforementioned projects.

Pros/Potential	Cons/Risks
• Encourages companies to make environmentally focused investments that they may not make without the loan guarantees.	

Relevant Documentation	Utilization / Availability Data
• https://www.finnvera.fi/eng/Products/Guarantees/Environmental-Guarantee	

Instrument Name	Country	ID
Housing Fund of Finland (ARA) - Perusparannuksen lainoitus *Basic improvement lending*	**Finland**	**3.1.3**
Instrument Type	**Direct/Indirect**	
Soft loan	**Indirect**	

Instrument Scope

Grants (in the form of soft loan) are awarded for:

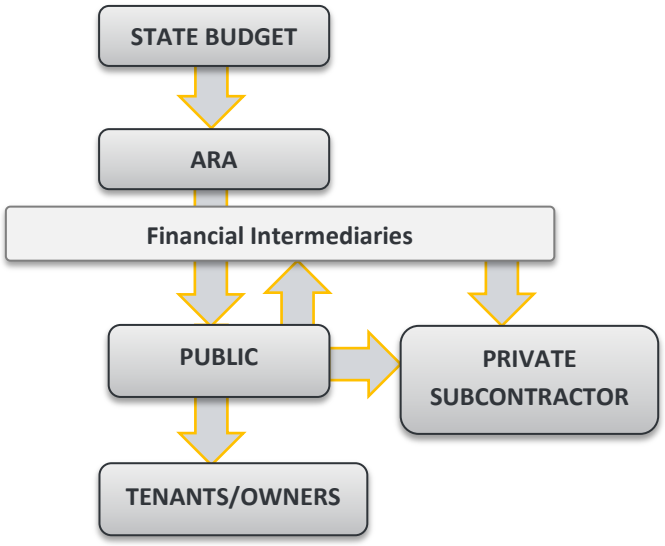
1) Conducting independent energy audits
2) External repair work as defined in legislation
3) Improving the ventilation and heating systems
4) Implementing renewable energy sources.

In individual apartments and apartment buildings.

Stakeholders

- **State –** providing the budget to ARA
- **Housing Finance and Development Centre (ARA) –** disbursing the grants
- **Public entities –** receiving the grants and subcontracting the works
- **Private subcontracting entities –** carrying out the works
- **Financial Intermediaries** – administering the grants and the works payments
- **Tenants/owners –** carry some of the costs

Scheme



Description

Within an approved authorization in the State Budget, repair and energy grants can be made by The Housing Finance and Development Centre of Finland (ARA) for improvements in the condition and quality of individual apartments and apartment buildings. The purpose of the grants is to improve the energy economy of residential buildings. Grants are aimed at reducing both energy consumption and emissions of greenhouse gases.

The mechanism covers up to 15 - 25 % of the approved costs and is awarded by the local authority (ARA) through a 'soft loan' scheme. The loan may be granted charitable status in the designated entity for the company or in the form of implemented its direct ownership of items. Community non-profit subsidiary of the loan can be granted only in direct ownership in the future.

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- municipalities or other public entity,
- non-profit organizations appointing a community housing fund (ARA)
- limited liability companies owned by any of the above-mentioned

Pros/Potential	Cons/Risks

Relevant Documentation	Utilization / Availability Data
• http://www.iea.org/policiesandmeasures/pams/finland/name-22865-en.php?s=dHlwZT1lZSZzdGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlYWRjcnVtYiI-PGEgaHJlZj0iLyI-SW50ZXJuYXRpb25hbCBFbmVyZ3kgQWdlbmN5Jnp3bmo7PC9hPjxzcGFuPiAmZ3Q7IDwvc3Bhbj48YSBocmVmPSIvcG9saWNpZXNhbmRtZWFzdXJlcy8iPlBvbGljaWVzIGFuZCBNZWFzdXJlczwvYT48c3Bhbj4gJmd0OyA8L3NwYW4-PGEgaHJlZj0iL3BvbGljaWVzYW5kbWVhc3VyZXMvZW5lcmd5ZWZmaWNpZW5jeS8iPkVuZXJneSBFZmZpY2llbmN5PC9hPjxzcGFuIGNsYXNzPSJsYXN0Ij48L3NwYW4-PC9uYXY- • http://www.ara.fi/fi-FI/Rahoitus • http://www.ara.fi/fi-FI/Rahoitus/Perusparannuksen_lainoitus	

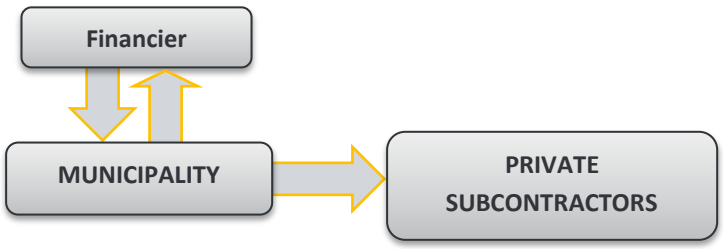
Instrument Name	Country	ID
Municipality Finance (Kuntarahoitus) – Vihreä rahoitus *Green funding*	**Finland**	**3.1.4**
Instrument Type	**Direct/Indirect**	
Soft loan	**Direct**	

Instrument Scope

Green funding (in the form of soft loan) can be awarded for investments that will generate significant and quantifiable environmental benefits. Examples of potential investments:

- Renewable energy
- Public transport
- Sustainable construction
- Waste water treatment and purification of water
- Energy efficiency
- Waste management
- Environmental management and nature protection

For municipalities, community of municipalities, companies if municipality is the majority owner and public utility housing operators.

Stakeholders	Scheme
• **Financier (Municipality Financing)** – Loan provider • **Municipality / community of municipalities / companies when municipality is the majority owner / public utility housing operators –** receiving the funds and subcontracting the works • **Private subcontracting entities –** carrying out the works	

Description

Municipality Finance is a financing company offering loans and other financing method for municipal entities. Green financing in the form of soft loan can be awarded for investments that will generate significant and quantifiable environmental benefits. The Green loan is more inexpensive compared to other loans. Financing is aimed at reducing emissions of greenhouse gases and adaptation to climate change.

Eligibility/Access Procedure		
The subjects that can apply to the scheme are: • municipalities • community of municipalities • companies if municipality is the majority owner • public utility housing operators		
Pros/Potential	**Cons/Risks**	
• Green loan is cheaper compared to other financing methods provided by Municipality Financing		
Relevant Documentation		**Utilization / Availability Data**
• **https://www.kuntarahoitus.fi/vihrea-rahoitus** • **https://www.kuntarahoitus.fi/sites/default/files/content_block/field_file/vihrearahoitus_esite_2016.pdf** • **https://www.kuntarahoitus.fi/sites/default/files/content_block/field_file/vihrean_rahoituksen_viitekehys.pdf**		

Instrument Name	**Country**	**ID**
PAREER Programme *(Aid Programme for Energy Rehabilitation in Buildings in the Household and Hotel Sectors)*	**Spain**	**3.1.5**
Instrument Type	**Direct/Indirect**	
Soft Loan	**Direct**	

Instrument Scope

This financial aid´s scope includes actions to improve energy efficiency and reduction in GH emissions as well as renewable energies exploitation in existing buildings built before 2014.
Intervention types are as follows:

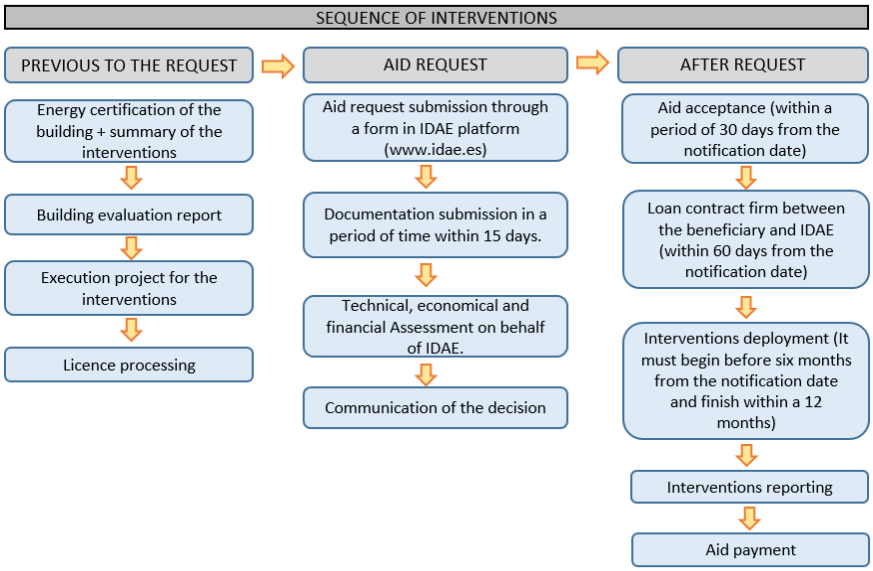
1. Improvement of the thermal envelope energy efficiency.
2. Improvement of energy efficiency in thermal and lighting installations.
3. Replacement of conventional energy for biomass in thermal installations.
4. Replacement of conventional energy with geothermal energy in thermal installations.

In the following table all subsidy percentages are reflected per action typology.

Action types		Max percent of Non-recoverable funds (over the total eligible cost)		Maximum percent of the loan (over the total eligible cost)
		IDAE Subsidy	Additional subsidies according to certain criteria	
ENERGY EFFICIENCY	Type 1: Energy efficiency improvements of the **thermal enclosure**	30%	Depending on the energy use, the deployment of more than one typology action simultaneously and on an extra improvement in the EE certification of the building.	60%
	Type 2. EE improvements in **thermal and lighting facilities** (when total rated thermal input > 40 Kw)	20%		70%
RENEWABLE ENERGIES	Type 3. Replacement of conventional energy for **biomass** (when total rated thermal input > 40 Kw)	25%		65%
	Type 4. Replacement of conventional energy for **geothermal** one (when total rated thermal input > 10 Kw)	30%		60%

In particular, eligible actions are those:

- described in Annex I_BOE 235_01/10/2013_Sec.III_Pag.79433, for each typology
- meeting the minimum technical requirements for energy efficiency as per Annex I_BOE 235_01/10/2013_Sec.III_Pag.79433, as well as the current technical legislation.

Stakeholders	Scheme
• **IDAE -** Instituto para la Diversificación y Ahorro de la Energía. • **Grant Beneficiaries:** can be physical persons, public/private organizations, and not-for-profits. Neighbourhood associations, building owners, lessee companies and ESCOs.	

Description

The aid entails a percent of sunk cost and other as a loan (see the table above). Loan conditions are the following:

- Interest rate: Euribor + 0,0 %.
- Maximum period of loan repayment: 12 years.
- Guarantees: bank guarantee and surety agreement.

Aided performances will be selected based on competition, precedence will be given to suitable projects in order of date of filing until the end of the available budget or the program end date, whichever is earlier.
The aid granted to carry out actions to improve the energy efficiency shall be subject to the conditions and limits set out in EC 1998/2006 and to Articles 87 and 88 of OJ L 379, 28/12/2006.

To determine the gross amount of grant equivalent to a repayable loan, the procedure of rates' setting as per 2008/C14/02 must be followed. In any case, the final amount of these loans will be subject to the maximum aid level compatible with the EU specific legislation on the activity for which it has been granted funding.

The aid granted shall be incompatible with any other grant, for the same purpose, established by any public authority or body or entity, public, national or international, and with specific reference to programs promoting building rehabilitation, regeneration and urban renewal as established by Royal Decree 233 of 05/04/2013. Simultaneous receive of aid from both routes, for the same purpose, will lead to revocation and, if necessary, refund of the entire aid.

Eligibility/Access Procedure
The actions committed shall be made in property or assets owned by the applicant or recipient of the aid before 2013. The renovation must not have started before the entry into force of the program, as demonstrated by submitting a photocopy of the permit or building permit or justification. At least 70% of the building surface above ground should be intended for residential housing; for hotels, the destination must be demonstrated according to Annex I_RD 1175_ 28/09/1990 (group 681). Projects need to fall within instrument scope, and need to be compliant with relevant technical rules and regulations. Beneficiaries, except for those who are individuals, organizations and non-profit institutions that cannot undertake economic activities, must submit sworn statement concerning employment of the entire aid for the purposes stated on the project. Likewise, they must submit sworn statement that company is not in crisis or administrative procedure. The actions receiving aid should improve the overall building energy rating of at least one letter in the measurement of kg CO2/sqm per year, with respect to the initial energy rating of the building. This improved rating may be obtained by a single type of approach or by a combination of several, and by performing partial measures of one or several different actions. Energy certification building will be in accordance with national legislation. In a multiple homes' building, only comprehensive actions on the envelope and heating system will be considered eligible. To be considered eligible in typologies 2, 3 and 4, the rated thermal power generating heat/cold must be greater than 100 kW, when there are multiple generators of heat/cold being replaced, this power will be obtained as the sum of the nominal thermal power. In case of actions that incorporate solar thermal power, the effects shall be determined by multiplying the area of open field solar collectors installed by 0.7 kW / sqm. In the event that solar thermal is complementary to other heat/cold systems on which action is taken, the power is determined as sum of the power of both systems. The implementation of the actions involved in the aid application must start in a period not exceeding six months from the date of notification of the corresponding decision to grant aid. Eligible costs: professional fees paid for preparation, energy performance certificate , regular inspection, cost of drafting technical projects and similar overhead, costs of management and execution of works, equipment, implementation costs, associated civil works and auxiliary facilities, and more specific issues as of Annex I. Licenses, taxes and other fees are NOT eligible costs. To be considered eligible, costs must have been Invoiced to the beneficiary before the date of entry into force of Program. Access procedure is via Web portal (submission of the proposal and, within 15 days, of the required documentation). Receiving an answer and the institution of the loan directly from IDAE.

Pros/Potential	**Cons/Risks**

Relevant Documentation	Utilization / Availability Data
• http://www.iea.org/policiesandmeasures/pams/spain/name-142621-en.php?s=dHlwZT1lZSZzdGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlYWRjcnVtYiI-PGEgaHJlZj0iLyI-SW50ZXJuYXRpb25hbCBFbmVyZ3kgQWdlbmN5Jnp3bmo7PC9hPjxzcGFuPiAmZ3Q7IDwvc3Bhbj48YSBocmVmPSIvcG9saWNpZXNhbmRtZWFzdXJlcy8iPlBvbGljaWVzIGFuZCBNZWFzdXJlczwvYT48c3Bhbj4gJmd0OyA8L3NwYW4-PGEgaHJlZj0iL3BvbGljaWVzYW5kbWVhc3VyZXMvZW5lcmd5ZWZmaWNpZW5jeS8iPkVuZXJneSBFZmZpY2llbmN5PC9hPjxzcGFuIGNsYXNzPSJsYXN0Ij48L3NwYW4-PC9uYXY- • http://www.boe.es/boe/dias/2013/10/01/pdfs/BOE-A-2013-10201.pdf	125,000,000 EUR available subdivided in: (1) 31.250.000 EUR (2) 31.250.000 EUR (3) 31.250.000 EUR (4) 31.250.000 EUR •

Instrument Name	Country	ID
Public sector - Elinkaarihankkeet *Life cycle projects / Public Private Partnership*	**Finland**	**3.1.6**
Instrument Type	**Direct/Indirect**	
Soft Loan	**Indirect**	

Instrument Scope

In Finland, life cycle projects have been carried out by the state and municipalities or cities.

1. Municipalities and cities: schools and day-care centres etc., new construction or renovations
2. State: motorway projects by project financing (the financier will fund a project company founded for the project)

Long term life cycle responsibility is required in projects contracts. This means economic responsibility and responsibility for maintenance and upkeep during the life cycle (for example 20-25 years). The state and city life cycle projects differ in scope and financing methods.

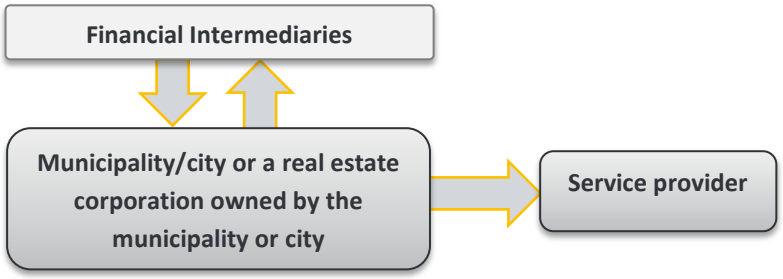
Stakeholders

- **Municipality or city –** the public sector, promoter of the building project
- **Real estate corporation –** A real estate corporation owned by the municipality or city can take out a loan for the project instead of the municipality/city itself.
- **Service provider –** carrying out the design, works and upkeep of the building
- **Financial Intermediaries** – loan providers or leasing companies

Scheme

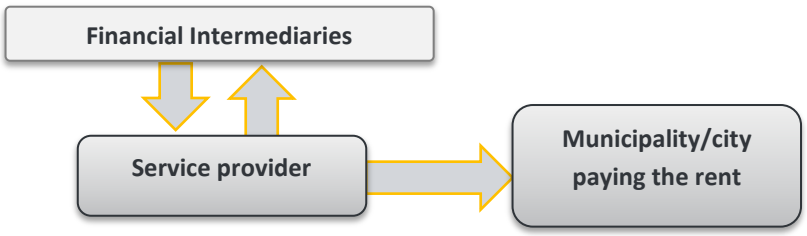
Loan

Buildings are owned by the municipality/city or real estate corporation owned by the municipality or city



Leasing

Financier will pay the construction, municipality/city will rent the buildings.



Description
Completed Public Private Partnership (PPP) projects in Finland include school and day-care centre construction projects constructed by cities or municipalities and motorway projects constructed by the state. The PPP projects are usually called life cycle projects in Finland because long term life cycle responsibility is required in projects contracts. This means that the service provider has both economic responsibility and responsibility for maintenance and upkeep during the life cycle of the project. The public sector will pay service fee to the private contractor during the contract period. The state and city life cycle projects differ in scope and financing methods. The state motorway projects have been implemented by using project financing: the financier will fund a project company founded especially for the project. The state's transport agency has the obligation to pay when the road has been put to use. Cities and municipalities have several options for financing the projects: 1. Loan is taken out by the municipality/city and the municipality/city will be the owner of the buildings 2. Loan is taken by a real estate corporation owned by the municipality or city and the real estate corporation will be the owner of the buildings 3. Leasing: the financier will pay the construction and municipality/city will rent the buildings.
Eligibility/Access Procedure
The subjects that can apply to the scheme are: • municipalities or cities • state

Pros/Potential (school / day-care centre project)	**Cons/Risks** (school / day-care centre project)
• Operation costs of the building can be reduced because life cycle projects help promote good design and construction and efficient planning of the operating phase • The contractor is responsible of the risks related to the construction, commissioning and use of the building • The contract will encourage to maintain the buildings in good condition	• Preparation of the project takes more time compared to the traditional model • If the contractor cannot control all the risks, the project may turn out to be more expensive than expected

Relevant Documentation	**Utilization / Availability Data**
• https://www.rakennustieto.fi/Downloads/RK/RK140201.pdf	

4. GRANTS: REGIONAL, LOCAL AND IDIOSYNCRATIC

Grants are non-repayable funds or products disbursed by one party (public, private or no-profit), to a recipient (an entity, an individual or a consortium) for a well-defined projects and after a proposal/formal application process.

Specific grants may be arranged:

- at government policy level, for large infrastructural projects, in the form of ***tiered funding***
- at government agency level for smaller projects, as ***municipal/regional grants***
- to serve a very specific purpose through a one-off targeted project as ***idiosyncratic grants***

Grants at the EU level are provided by either the Council of Europe (CoE) or the EU Commission (EC). They are generally accessed via specific calls for project proposals, often grouped into 7-year funding cycles, known as Framework Programmes. These are treated in section 3.3. EU Institutions, or other International Financial Institutions (IFI), may also set up one-off grants dealing with unforeseen aspects or special themes.

Within the scope of this research, grants also feature as one of the three main sources of financing. Examples of grants are listed in 4.1 following.

In Spain, the PAREER programme (3.1.5), pairs loans with grants, whereby grants finance up to 90% of the intervention (instead of only the 60-70%). More grants are offered at a regional and local level in Murcia, Catalunya and in the city of Barcelona (4.1.1). Whilst in the case of Murcia the grant is intermediated, that is given by the local government to ESCO companies (3.1.4) following energy efficiency interventions, in Catalunya and in Barcelona it is directly given to the home owners or to the owners' communities. Moreover, in Murcia the focus is single commercial buildings whereas the Catalunya and Barcelona initiatives focus on residential buildings, with energy efficiency retrofit being only one part of the spectrum of eligible interventions, which also include structural and accessibility improvements.

In Finland, we located two grant schemes administered by the central government through financial intermediaries and through the municipalities. These were respectively the TEM-ELY Institutions and the ARA Housing Fund. The TEM-ELY grant (4.1.3) is directed to municipalities/companies for larger interventions involving small neighbourhoods, whereas the ARA grants (4.1.2) are for single buildings/dwellings.

In Italy, the national grant Conto Termico (4.1.5) has given way to the regional grants PRUACS (4.1.7) and the so-called neighbourhood's Contracts or CdQ (Contratti di Quartiere, 4.1.6). The Conto Termico was intermediated through the national administrative authority GSE through a web platform and directed to both public and private beneficiaries, the PRUACS and the CdQ, alternatively, utilize a

regional government as the interface between the Ministry and the citizens and have specific financing quotas for each type of building use (offices, housing, social housing), as they focus on small urban areas rather than on single buildings.

Benchmarks, eligibility conditions and costs covered are very different, as they generally depend on the programme's aim. In Spain's PAREER, the main access criteria are reduction in CO_2 and KW of generated power, Murcia looks simply at company size and financial status and the Catalunya/Barcelona area have more complex scoring systems accounting for building age, destination, inhabitants' income, intervention amount and one/a set of energy parameters. Another scoring system is utilised by Italy, in parallel with results from a building assessment according to the national energy and environmental protocol. In contrast, Finland is much less restrictive in terms of eligibility criteria, limiting itself to identify samples of interventions, with particular attention to buildings inhabited by more sensitive social categories such as the elderly.

As for costs covered, the incentives usually encompass the entire project from inception to implementation, sometimes with the exclusion of licences and taxes (PAREER in Spain), sometimes including audits (Murcia, Finland) and often with a specific attention particular initiatives (e.g. improvement of ventilation efficiency in Finland). In Italy, PRUACS and CdQ cover the whole project elements but Conto Termico, covers only the 'extra cost' for the improvement installations and the licensing.

Finally, the extent of the incentive varies greatly: it can finance the entire cost (PAREER, PRUACS and CdQ), a percentage (Murcia, Finland), a range (Barcelona and Catalunya) or a specific portion (Conto Termico).

Grants have been widely used in the past, especially by the EU and are still used extensively in East Europe as well as in Spain. The lack of control on the outcome, however, meant this financing mechanism hasn't been effective in developing a self-sustaining market for energy efficiency retrofits, in the long run (Energycities, 2014). For this reason, an extensive use of grants is beneficial mainly in first-of-a-kind projects (high innovation content) or in countries where technical capabilities in specific sectors are underdeveloped.

4.1. CASE STUDIES ON GRANTS

Instrument Name	Country	ID
Promotion for the rehabilitation of residential buildings	**Spain**	**4.1.1**
Instrument Type	**Direct/Indirect**	
Grant	**Direct**	

Instrument Scope

The scope of the instrument is to promote the maintenance of buildings in relation to improving the quality and sustainability, and to implement common shares to improve accessibility.

Eligible works are:

Rehabilitation works

- The rehabilitation works regarding the maintenance of the structure of the building and its facilities
- The rehabilitation works regarding the conservation of roofs of buildings and envelopes (only historic buildings).
- The rehabilitation works in relation to the conservation of roofs of buildings and envelopes (not historic buildings when the action improves the envelope energy efficiency
- The rehabilitation works improving the community service of a building (electrical, gas, telecommunications, water, waste)

Civil works in relation to improve the quality and the sustainability

These actions must save, at least, 30% of the original energy consumption. Are eligible:

- Improving the building envelope relative to reduction of thermal demand according to DB-HE1 of the Edification Technical Code (Spanish normative).
- The installation of cooling and heating systems, hot water for human use and ventilation to thermal conditions (including the substitution of systems installed)
- The replacement of equipment that allows the use of renewable energies.
- Improving the energy efficiency in the services of the community (control lighting, Led technology, use of natural light, ...)
- Installation of water saving systems.
- Improving the waste collect system.

Accessibility - No interesting in relation to improve the efficiency energy

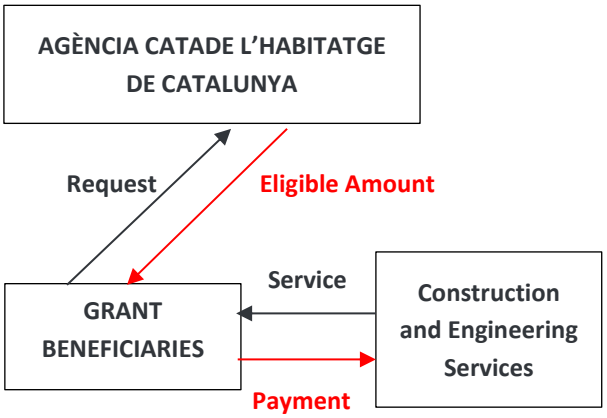
Amount of grant and limits:

The grant is calculated according the cost of the action. It cannot reach over € 11,000 for dwelling or for 100 square meters (€ 12,000 for historical buildings).

The way to calculate the grant is:

a) € 2,000 in rehabilitation works. Possibility to add € 1,000 plus if the action includes a sustainability action.
b) € 2,000 in civil works in relation to improve the quality and the sustainability. This amount increases until € 5,000 if the actions expect energy savings over 50% of the original consumption.
c) € 4,000 in accessibility actions

Those amounts can add 10% if it's a historical building. The maximum amount is 35% of the eligible cost.

Stakeholders	**Scheme**
• AGÈNCIA DE L'HABITATGE DE CATALUNYA (Dwelling Agency of Catalunya) • Grant beneficiaries: a) Owner communities b) Dwelling building owners c) Public administrations and another dwelling owner associations - Constructors and Engineering Services	

Description

Residential buildings with several housing must meet the following requirements

- Building constructed before 1981
- 70% of the area of the building is residential (ground floor uses doesn't count)
- 70% of all housing should be occupied and used by the owners or lessees
- Buildings destined to be rented as housing over the next 10 years.
- Buildings must be at least 8 dwelling. Exceptional cases with only 1 dwelling may be included in the grant (people over 65 years, buildings with structural deficiencies and people with low mobility)
- A mandatory inspection report and the energy performance certificate must be included in the application

The eligible cost are:

- The cost of the work execution
- The cost of engineering studies
- The wording of the draft, certificates and technical reports (Tax and VAT are not eligible)

Eligibility/Access Procedure

Actions must be executed in Catalonia (excludes Barcelona city and its metropolitan area)

The request must use the standard forms.

The resolution of the request is scored on the following criteria

- 5 points. Request for building works conservations where at least 60% of homeowners are part of living units with no income-weighted superiors the following chart.

IRSC Code	1 member	2 members	3 members	4 or more members
A	€ 69,053.66	€ 71,189.34	€ 74,251.25	€ 74,515.66
B	€ 64,737.81	€ 66,740.01	€ 69,610.54	€ 69,858.43
C	€ 60,929.70	€ 62,814.12	€ 65,515.81	€ 65,749.11
D	€ 51,790.25	€ 53,392.01	€ 55,688.44	€ 55,886.74

- 4 points. Request for the rehabilitation works regarding the maintenance of the structure of the building and its facilities
- 4 points. Request for the actions to improve the accessibility in the building
- 2 points. Request for Civil works in relation to improve the quality and the sustainability
- 1 point. For other requests, in which priority is set according to the order entry to request

Pros/Potential	Cons/Risks
• Not only for an specific energy system, whatever able to improve the energy consumption (actives and passives systems)	• The accessibility actions are scored with 4 points despite they don't improve the efficiency energy. • The grant is only for residential buildings constructed before 1981 • The actions must be executed in Catalonia (excluding Barcelona and its metropolitan area) • The deadline to present the request was in July of 2016

Relevant Documentation	Utilization Data

Instrument Name	Country	ID
Housing Fund of Finland (ARA) – Korjaus- ja energia-avustukset *Reparation and energy grant*	**Finland**	**4.1.2**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

Grants are awarded for:

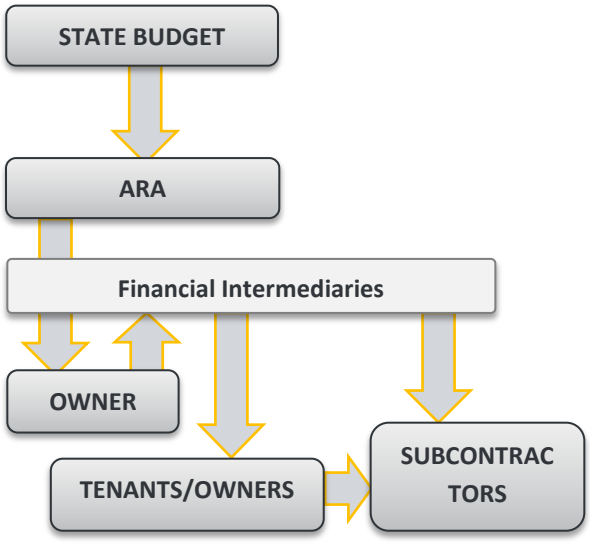
5) Conducting independent energy audits
6) External repair work as defined in legislation
7) Improving the ventilation and heating systems
8) Implementing renewable energy sources
9) Repairing apartments for elderly or disabled people

In individual apartments, single dwellings and residential buildings with at most two apartments. The apartment/dwelling/building must be in residential use around the year.

Stakeholders

- **State –** providing the budget to ARA
- **Housing Finance and Development Centre (ARA) –** disbursing the grants
- **Building / apartment owner –** receiving the grants and subcontracting the works
- **Private subcontracting entities –** carrying out the works
- **Financial Intermediaries** – administering the grants and the works payments
- **Tenants/owners –** carry some of the costs

Scheme



Description

Within an approved authorization in the State Budget, repair and energy grants can be made by The Housing Finance and Development Centre of Finland (ARA) for improvements in the condition and quality of individual apartments, single dwellings and residential buildings with at most two apartments. The purpose of the grants is to improve the energy efficiency of residential buildings, to improve living conditions by removing health detriments or to repair apartments to be suitable for elderly or disabled people's needs.

Energy grants are aimed at reducing both energy consumption and emissions of greenhouse gases.
The energy grant covers up to 25 % of the approved costs. The repair grant for elderly/disabled person's apartment can cover up to 40 % of the approved costs or 70 % in special cases (apartments for veterans or economic circumstances of the owner). The application for the grant must first be sent to local public entity (municipality/city) and then local authority (ARA) will award the necessary grant to municipality/city. Grants can then be awarded for building owners by the municipality/city.

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- Individual apartments, single dwellings and residential buildings with at most two apartments
- The grant will be disbursed for the owner of the apartment

Pros/Potential	**Cons/Risks**
• Building owners can improve the living conditions and energy efficiency at lower cost	

Relevant Documentation	**Utilization / Availability Data**
• http://www.ara.fi/fi-FI/Rahoitus/Avustukset/Kuntien_myontamat_korjaus_ja_energiaavustukset • http://www.ara.fi/fi-FI/Rahoitus/Avustukset/Kuntien_myontamat_korjaus_ja_energiaavustukset/Pientalojen_harkinnanvarainen_energiaavustus	

Instrument Name	Country	ID
Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) - Energiatuki *Energy grant*	**Finland**	**4.1.3**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

Financing for investments that will promote:

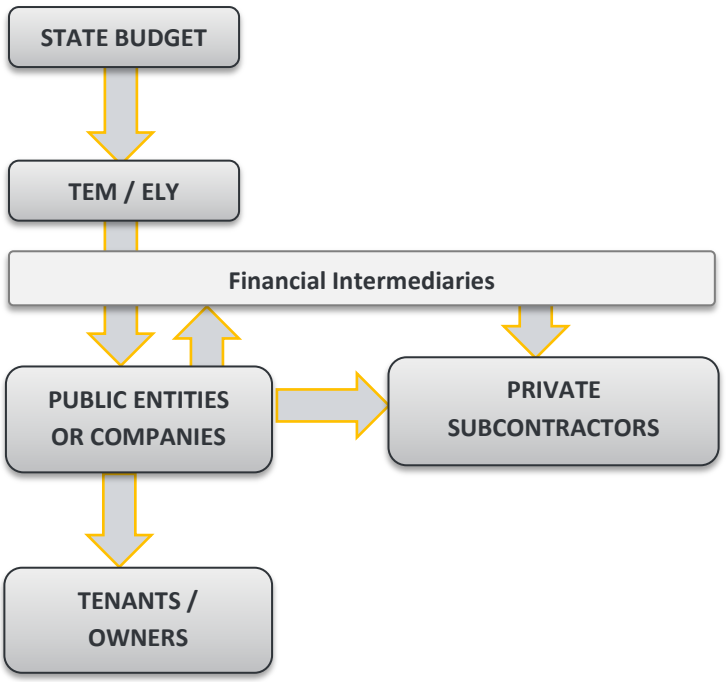
10) Use or production of renewable energy
11) Energy savings or optimisation of energy production or use
12) Reduction of environmental impacts caused by energy production or use

In addition, financing can also be granted for energy analyses and energy audits. Financing is granted for companies, municipalities and other communities.

Stakeholders

- **State –** providing the budget to ELY and TEM
- **Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) –** disbursing the grants
- **Public entities or companies –** receiving the grants and subcontracting the works
- **Private subcontracting entities –** carrying out the works
- **Financial Intermediaries** – administering the grants and the works payments
- **Tenants/owners –** carry some of the costs

Scheme



Description

Within an approved authorization in the State Budget, energy grants can be made by Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) for investments that will promote: use or production of renewable energy, energy savings, optimisation of energy production or use and reduction of environmental impacts caused by energy production or use. In addition, financing can also be granted for energy analyses and energy audits. Grants for investments over 5 000 000 €, investigations over 250 000 €, new technologies and development of services and methods will be disbursed by TEM. Grants for other projects will be disbursed by ELY.

The main goal is to promote the use of new energy technologies and the launching of new technologies on the market by improving the profitability of the investment and reducing the economic risks related to the new technologies. Grants are aimed at climate- and environmentally friendly investments, projects, audits and analyses.

According to the Finnish council of state, the amount of the grant can be **up to**

- 60 % for municipal renewable energy surveys
- 50 % for municipal, micro-enterprise and small and medium enterprise energy audits
- 40 % for other energy audits, analyses and surveys
- 40 % for renewable energy and energy efficiency investments, new technologies
- 30 % for renewable energy and energy efficiency investments, common technologies
- 30 % for other investments reducing the environmental impacts of energy production

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- municipalities or other public entity
- companies
- other communities

Typical projects and grants (2016):

Renewable energy

- heating plants (wood fuel) 10-15 %
- heat pump projects 15 %
- Solar thermal energy projects 20 %
- Micro water power plants 15-20 %
- Landfill gas projects 15-20 %
- Solar power projects 25 %
- Biogas projects 20-30 %
- Micro wind power projects 20-25 %

Energy saving and energy efficiency investments

- 20 % for applicants joining the TEM energy efficiency agreement (i.e. will intend to improve energy efficiency long-termly)
- 25 % if ESCO is used and applicant is joining the energy efficiency agreement
- 15 % if ESCO is used and applicant is NOT joining the energy efficiency agreement

The projects that can NOT apply to the scheme are:

- heating plants over 10 MW
- heat production projects that will change the heating source from district heating to a separate plant
- energy efficiency and heat pump projects in new buildings (except new technologies)
- equipment used to produce wood fuel or recovered fuel
- waste incineration plants
- street lighting
- energy audits by large companies
-

Pros/Potential	Cons/Risks

Relevant Documentation	Utilization / Availability Data
• http://tem.fi/energiatuki1 • http://www.ely-keskus.fi/fi/web/ely/energiatuki?categoryId=63655#.V3Ji2_mLRmN	

Instrument Name	Country	ID
KEHOP (KÖRNYEZETI ÉS ENERGIAHATÉKONYSÁGI OPERATÍV PROGRAM) *Environment and Energy Efficiency Operative Programme*	**Hungary**	**4.1.4**
Instrument Type	**Direct/Indirect**	
Grant	**Mixed: Indirect / Direct**	

Instrument Scope

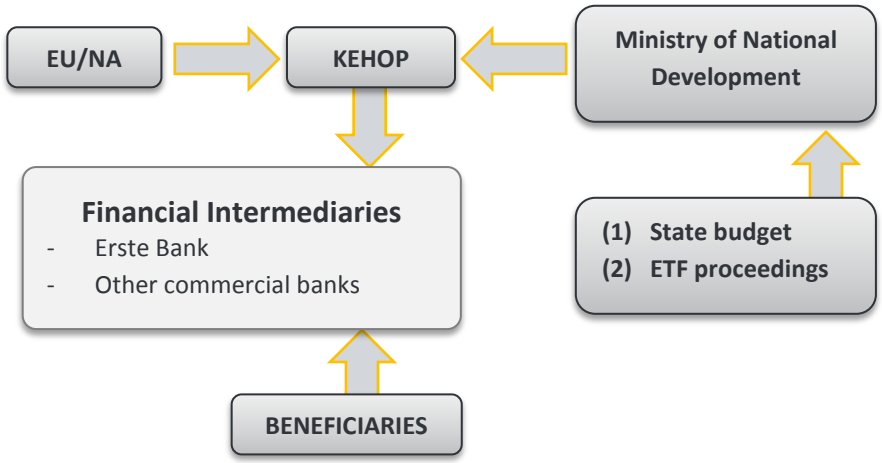
The policy supports three main programmes:

- **ZFR-TH / 2015 Housing loan interest subsidy:** includes modernization of apartment buildings by replacement of windows and doors, insulation and combination of refurbishment with renewable energy sources. The achievable subsidy is basically an interest subsidy with 5 year duration. The subsidy is 50% of the government bond yield.

- **MGCS/15 Large household appliances (washing machine) replacing:** with a maximum grant of 50% non-refundable, depending on the class of the machine.

- **savings for housing purposes:** by opening a special savings account and taking a regular voluntary payment for min 4 years (max 10 years) in a commercial bank, the government would match with an additional +30% (max of 72k HUF / 231 EUR per year) guaranteeing a rate of return of 12.72%: the saving can be used for any other cost related to housing, including but not limited to energy efficiency purposes. The account is personal therefore every family member can have an account; additionally, the employer can provide tax-free support to its staff members for residential purposes.

The policies are therefore aimed at residential buildings, either newly bought (newly built) or existing and it is therefore a hybrid instrument.

Stakeholders	Scheme
• **EU -** making available structural subsidies • **NA National Agency for Hungary -** administering subsidies • **KEHOP -** supported funds • **Ministry of National Development -** getting support from (1) state budget and (2) ETS proceeds • **Erste Bank (commercial bank)** and other financial intermediaries • **Beneficiaries (families) –** applying/receiving loans and creating savings' accounts	

Description
This policy includes 3 main sources of funding: 1. EU structural subsidies 2. state revenues from the EU Emission Trading System 3. State budget law. which means it is Co-Financed, through EU Funds and national sources in the following way: - EU funds being received by KEHOP supported energy efficiency funds with repayable support - the Green Economy Financial System (ZFR) managed by the Ministry of National Development, gets support from the state budget as a total of 5 billion HUF (17m EUR), which increases of further 2 billion HUF (5m EUR) from the EU Emission Trading Systems according to the new act. The programmes are operated through an agreement with commercial banks: according to the contract in 2015 with the Erste Bank Hungary, the bank is required to start a new Energy Efficiency Loan Program with 100 million euros worth between 2016 and 2018. Whilst some key objectives such as the accessibility and energy efficiency are displayed, this is a hybrid instrument aimed at: - helping more young families / families with more children to get their first home; - helping the overall renovation of buildings.
Eligibility/Access Procedure
ZFR-TH Programme: - Award of subsidy depends on the verified saved CO2 ranging between 750–950 HUF/CO2 kg and an energy efficiency contract declaring a C class or lower must be submitted priori to works commencement - Detailed rules for the home making and subsidy's interest rates are contained in Decree 341/2011 (XII. 29.) . - The homemaking interest subsidized loan does not prevent the use of existing, state-subsidized home ownership taken under other legislation or other loan. - the non-refundable assistance is calculated based on net floor area of the apartment until a maximum price of the apartment dependent on its location (e.g. city/towns/other settlements) and region - renovation mustn't have started prior to 01/01/2013 unless as a response of life threatening conditions - The subsidy is limited exclusively to property houses not subject to any kind of external ownership, lease or rental contract, exception made for 50% shared property between spouses or property acquired within a two years framework through inheritances or gifts. - Award of grant is for couples with children under 25 and for couples under 40; for couples under 35 and individuals with possessing less than 30% of the apartment cost, the state guarantees only provided the home price doesn't exceed specified limits. **MGCS -** Award of subsidy depends on class of the machine, and achieving of a minimum of 10% energy savings, or 20 kg / year CO2 savings.

Pros/Potential	**Cons/Risks**

Relevant Documentation	Utilization / Availability Data
• http://www.iea.org/policiesandmeasures/pams/hungary/name-153364-en.php?s=dHlwZT1lZSZzdGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlYWRjcnVtYiI-PGEgaHJlZj0iLyI-SW50ZXJuYXRpb25hbCBFbmVyZ3kgQWdlbmN5Jnp3bmo7PC9hPjxzcGFuPiAmZ3Q7IDwvc3Bhbj48YSBocmVmPSIvcG9saWNpZXNhbmRtZWFzdXJlcy8iPlBvbGljaWVzIGFuZCBNZWFzdXJlczwvYT48c3Bhbj4gJmd0OyA8L3NwYW4-PGEgaHJlZj0iL3BvbGljaWVzYW5kbWVhc3VyZXMvZW5lcmd5ZWZmaWNpZW5jeS8iPkVuZXJneSBFZmZpY2llbmN5PC9hPjxzcGFuIGNsYXNzPSJsYXN0Ij48L3NwYW4-PC9uYXY- • http://www.complex.hu/kzldat/t1500095.htm/t1500095.htm • http://www.kormanyhivatal.hu/download/4/cf/e1000/Hasznalt_lakas_vasarlas_tajekoztato_20150701.pdf • http://mkogy.jogtar.hu/?page=show&docid=a1500095.TV	100 billion HUF (321 million EUR) between 2015-2020 • ZFR-TH – 10b HUF (35m EUR) • MGCS - 500m HUF (1.5m EUR)

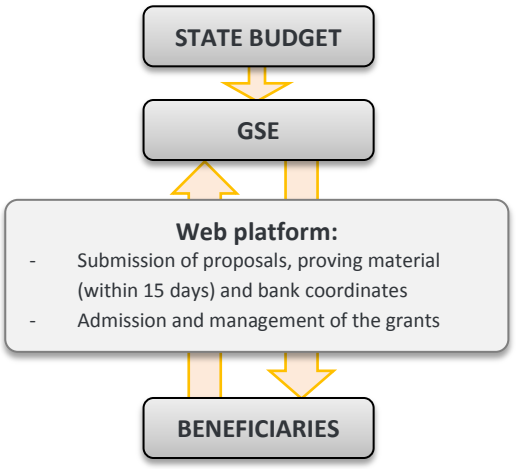
Instrument Name	Country	ID
Conto Termico *Renewable Energy for Heating & Cooling and small interventions increasing energy efficiency Support Scheme*	**Italy**	**4.1.5**
Instrument Type	**Direct/Indirect**	
Grant	**Direct**	

Instrument Scope

Eligible projects concern:

1. energy efficiency improvements in existing building envelopes (thermal insulation of walls, roofs and floors, replacement of doors, windows and shutters, installation of solar screens);
2. replacement of existing systems for winter heating with more efficient ones (condensing boilers);
3. replacement and, in some cases, construction of new renewable-energy systems (heat pumps, biomass boilers, heaters and fireplaces, solar thermal systems, including those based on the solar cooling technology).

The new decree also introduces - subject to specific requirements - incentives for energy auditing and energy certification associated with the above projects.

Stakeholders	Scheme
- **State –** determining the budget - **GSE –** authority administering the grants (assignation and disbursements) - **Beneficiaries –** receiving the grants and responsible for the works ('responsible parties').	

Description

The support is granted on the basis of the type of project and on the improvement of the energy performance of the building which may be achieved and/or on the energy which may be produced by renewable-energy systems. The incentive (contribution to the costs incurred for the project) will be paid in yearly instalments over a variable support period (2 to 5 years), depending on the projects.

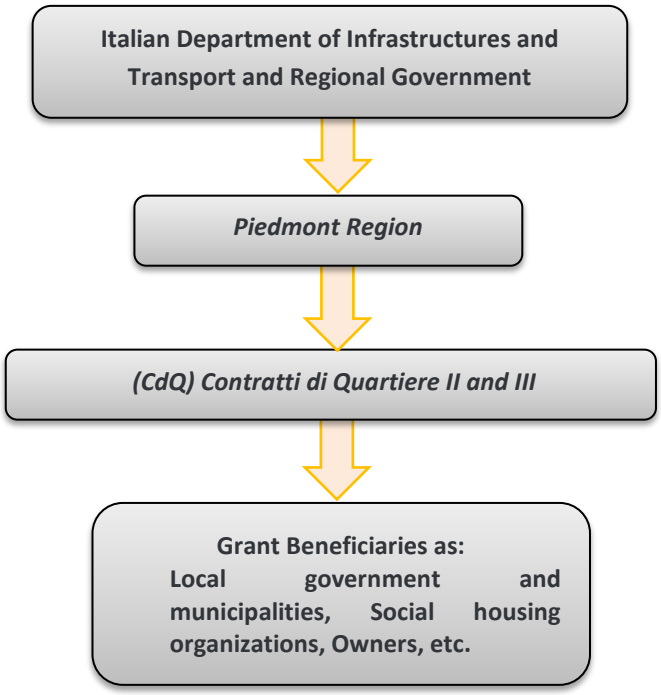
Eligibility/Access Procedure	
Two types of parties are eligible for this support scheme: 1. public administrations; 2. private parties: individuals, apartment block owners and parties with business or agricultural income. Recipient of the support is defined as "Responsible Party", i.e. the party who/which incurs/has incurred the costs for implementing the projects. Two categories of projects are eligible for the incentives: A. energy efficiency improvement projects; B. small-scale projects concerning systems for production of thermal energy from renewables and high-efficiency systems. Public administrations may apply for incentives for both categories of projects (categories A and B), whereas private parties may apply for incentives only for small-scale projects concerning systems for producing thermal energy from renewables and high-efficiency systems (category B). The incentive will be limited to the portion of the intervention exceeding the what normally required: - for complying with the obligation of integrating renewables into existing buildings on major renovations (Legislative Decree 28/11) - for complying with the obligation to obtain the building licence. Incentives to private parties cannot be cumulated with other forms of government support, except for guarantee funds, revolving funds and loans. For publicly-owned buildings for public use, the incentives may be cumulated with other grants. Incentives may be awarded to projects benefiting from other non-government incentives which may be cumulated, in accordance with the applicable national and EU legislation. Submission is possible through a specific web portal managed by the GSE authority.	
Pros/Potential	**Cons/Risks**

Relevant Documentation	**Utilization / Availability Data**
• http://www.iea.org/policiesandmeasures/pams/italy/name-38446-en.php?s=dHlwZT1lZSZzdGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlYWRjcnVtYiI-PGEgaHJlZj0iLyI-SW50ZXJuYXRpb25hbCBFbmVyZ3kgQWdlbmN5Jnp3bmo7PC9hPjxzcGFuPiAmZ3Q7IDwvc3Bhbj48YSBocmVmPSIvcG9saWNpZXNhbmRtZWFzdXJlcy8iPlBvbGljaWVzIGFuZCBNZWFzdXJlczwvYT48c3Bhbj4gJmd0OyA8L3NwYW4-PGEgaHJlZj0iL3BvbGljaWVzYW5kbWVhc3VyZXMvZW5lcmd5ZWZmaWNpZW5jeS8iPkVuZXJneSBFZmZpY2llbmN5PC9hPjxzcGFuIGNsYXNzPSJsYXN0Ij48L3NwYW4-PC9uYXY- • http://www.gse.it/it/Conto%20Termico/GSE_Documenti/_DM_28_DICEMBRE_2012_CONTO_TERMICO.PDF • http://www.gse.it/en/Heating_Cooling/Pages/default.aspx • http://www.gse.it	• **200m EUR for public projects** • **700m EUR for private projects** **so far utilised as follows:** • **13m EUR for public projects** • **53.5m EUR for private projects** ***(as of 13/04/2016)***

Instrument Name	Country	ID
Contratti di Quartiere (CdQ) - Italy	**Italy**	**4.1.6**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

Italian's CdQ are programs for the environmental and social restoration of large parts of urban territory, especially with regards to affordable and social housing.

Stakeholders	Scheme
• **Central government;** • **Local government and municipalities;** • **Social housing organizations;** • **Owners;** • **Building users.**	

Description

Call for tenders for urban regeneration projects, co-financed by the Italian Department of Infrastructures and Transport and co-financed and managed by each regional government.
As mentioned before, CdQ are programs for the environmental and social restoration of large parts of urban territory, especially with regards to affordable and social housing, II edition (CdQ II) started with law 21 (8 Feb 2001), still undergoing.

MUNICIPALITY	AMOUNT OF THE PROGRAMME €.
ALESSANDRIA	48.238.323,00
ASTI	55.933.709,65
AVIGLIANA	18.752.868,16
BEINASCO	10.277.960,48
BIELLA	13.707.712,00
BORGARO	32.554.639,36
CASALE	20.321.168,71
CHIVASSO	10.351.143,96
CUNEO	17.016.468,53
MONCALIERI	5.915.560,92
NOVARA	41.554.263,15
NOVI LIGURE	53.743.706,60
ORBASSANO	38.891.904,96
RIVALTA	17.408.894,99
SETTIMO	219.894.289,23
TORINO v. Dina	23.830.748,32
TO. v. Ghedini	17.109.400,11
TO. v.Parenzo	35.881.284,99
VENARIA	13.066.267,40
TOTALE	694.450.314,51

Total financing is € 694.460.000, the sources of funding are:

- Italian Department of Infrastructures and Transport and Regione Piemonte: € 117.986.483,76 (17% of total financing, 65% from central government and 35% from regional government)
- Municipalities € 113.693.295,80 (16% of total financing)
- Private funding € 375.399.658,59 (55% of total financing)
- Other public funding €. 86.156.575,03 (12% of total financing)

The total financing is divided into different types of intervention:

- Housing 49%
- Secondary infrastructures (schools, public buildings, etc.) 18%
- Primary infrastructures (streets, networks, etc.) 13%
- Offices & Retail 11%
- Actions & Services 9%

Central government financing is delivered according to the Ministry Decree of 30 Dec 2002 as follows:
15 yearly contributions of € 1.795.266,16 = € 26.928.992,39
Capital account € 49.762.222,05

Total financing from central government: € 76.691.214,44
Regional co-financing: € 26.795.042,64

Eligibility/Access Procedure
The Financial mechanism is quite simple, programs were selected and financed based on a series of indicators: • **Environmental sustainability** - First national application of Protocollo ITACA (2002): 8 criteria on resource consumption, 4 criteria on environmental loads, 1 criteria on eco-compatible materials - - Morphological quality (for integration and enhancement of historical contexts, and requalification of the urban environment) - Ecosystem quality (for resources consumption and environmental quality) - Usability quality (accessibility, flexibility, and a focus on vulnerable users) - Process quality (in construction and in use) • **Social sustainability** - Assessment of programs depending on the social issues in the area, e.g.: Ratio of non-workers, Schooling level, Ratio of school dropouts, Ratio of recovering addicts, Ratio of mental illness, Social housing quota. - Involvement of inhabitants, both in the design and operational phase of the program • **Economic sustainability** - Minimum criteria to participate to the call: Housing covered at least 60% by central-regional government financing, Infrastructures covered at most 40% by central-regional government financing, Municipalities financing at least 10% of quota of central-regional government financing, Environmental sustainability testing for housing, no less than 20% and no more than 25% of the central-regional government financing, and maxed at 12.500 € per dwelling. - Economic sustainability assessment criteria: Ratio of municipal financing / central-regional government financing, Ratio of private financing / central-regional government financing, Ratio of other public financing / central-regional government financing.

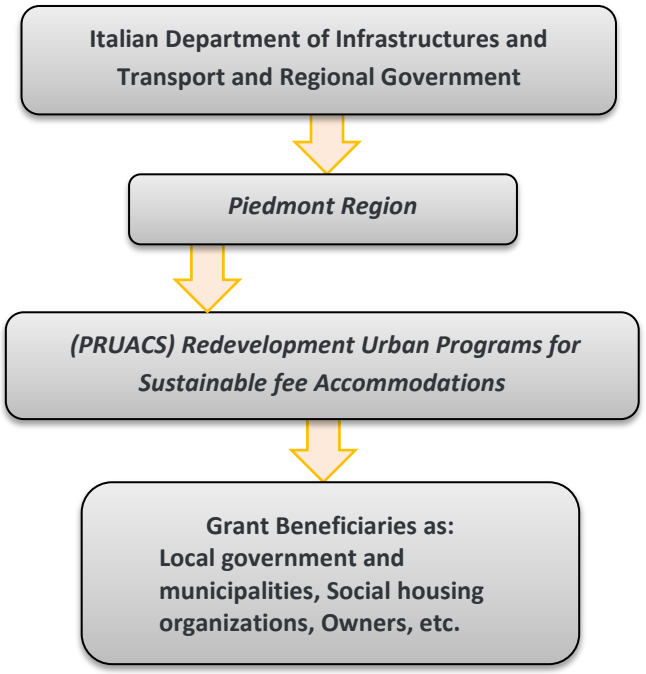
Pros/Potential	**Cons/Risks**

Relevant Documentation	**Utilization / Availability Data**
• http://www.regione.piemonte.it/edilizia/contrattiQuartiere.htm • http://www.mit.gov.it/mit/site.php?p=cm&o=vd&id=60 • http://www.mit.gov.it/mit/mop_all.php?p_id=03933	

Instrument Name	**Country**	**ID**
Redevelopment Urban Programs for Sustainable fee Accommodations (PRUACS)	**Italy**	**4.1.7**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

PRUACS are programs for the environmental and social restoration of large parts of urban territory, especially with regards to affordable and social housing.

Stakeholders	**Scheme**
• **Central government;** • **Local government and municipalities;** • **Social housing organizations;** • **Owners;** • **Building users.**	

Description

Call for tenders for urban regeneration projects, co-financed by the Italian Department of Infrastructures and Transport and co-financed and managed by each regional government. PRUACS started with Ministerial Decree 2295 (26 mar 2008), still undergoing and Regione Piemonte financed 7 PRUACS programs.

The sources of funding are:

- Italian Department of Infrastructures and Transport and Regione Piemonte: € 31.667.657,42 (44% of total financing, 70% from central government and 30% from regional government)
- Municipalities € 12.301.522,13 (17% of total financing)
- Private funding € 15.919.616,88 (22% of total financing)
- Other public funding €. 12.301.522,13 (17% of total financing)

The Total financing is € 72.361.894,91.

The breakdown of financing for type of intervention is :

- Private residential: 167 dwellings - Private investment in residential: €. 15.675.272,17
- Social housing: 152 dwellings - Central-regional government financing for social housing: € 16.101.471,42 (12% of which for sustainability testing and extra costs) - Central-regional government financing for infrastructures: € 15.566.105,66.

Eligibility/Access Procedure

Programs were selected and financed based on a series of indicators:

• **Environmental sustainability**

- Using Protocollo ITACA Regione Piemonte 2009: Integrating domotics and systems monitoring according to the outcomes of EU project NENA (INTERREG IIIB Alpine Space Program)
- Urban context
- Overcoming building and district decay

• **Social sustainability**

- Assessment of programs depending on the social issues in the area, e.g.: Ratio of non-workers, Schooling level, Ratio of school dropouts, Ratio of elderly inhabitants, Ratio of eviction, Social housing quota.
- Involvement of inhabitants, both in the design and operational phase of the program

• **Economic sustainability**

- Amount of municipal financing
- Amount of other public financing
  Amount of private financing

Pros/Potential	Cons/Risks

Relevant Documentation	Utilization / Availability Data
• http://www.regione.piemonte.it/governo/bollettino/abbonati/2014/16/attach/dgr_07292_375_24032014.pdf • http://www.regione.piemonte.it/governo/bollettino/abbonati/2015/29/attach/dgr_01611_1030_23062015.pdf	

5. INTERNATIONAL FINANCING PROGRAMMES

A 20% increase in Energy Efficiency by 2020 is one of the five pillars of the current EU medium-term strategy, adopted since 2010 (EU Commission, 2011). This has prompted financing initiatives at the transnational as well as national level, as shown in 5.1.

Soft loans and loan guarantees to private users or companies can lower the cost of capital. International Financial Institutions such as EBRD or EIB can influence the lending of local retail banks in this way. Other multilateral lenders also have these kinds of initiatives: for example, the co-financing model of KfW in Germany with local retail banks has apparently achieved considerable success at the housing unit level (Kfw, 2009). From a modelling perspective, these will influence the cost of capital, but, other than the class of eligible applications, do not pose any special adaptations to the modelling.

Such Financial Institutions also participate in several major development and technical assistance programmes, aimed at providing potential recipients with adequate capabilities to present sound project proposals, as well as larger EU-wide programmes of structural nature (that is linked to European Commission financing programmes).

The **European Energy Efficiency Fund (EEEF)** is a public-private partnership, managed by the EC, the EIB, the Italian CDP and Deutsche Bank, open to investments from institutional/professional investors. With a €265m global budget for the period 2014-2020, the EEEF offers loans, loan guarantees, equity, leasing structures and grants to municipal authorities and connected public/private entities (e.g. local utilities, and ESCOs) implementing efficiency and renewable energy projects in public buildings, including CHP, micro-cogeneration, district heating/cooling and decentralized RES. Investments need to range between €5 and €25m. In addition, EEEF reserved EUR €20m in funding dedicated for project development services (technical assistance) related to the preparation of projects.

Private Finance for Energy Efficiency (PF4EE, 5.1.1**)**, managed jointly by the EC and the EIB and funded by the LIFE programme, has a total budget of €480m and offers:

- a Risk Sharing Facility (loan guarantees)
- long-term financing from the EIB (EIB Loan for Energy Efficiency) in the range between €40k and €5m per project
- an Expert Support Facility (technical assistance) for the Financial Intermediaries implementing the program in the respective member states (adhering member states were the Czech Republic, France and Spain).

Eligible final recipients are efficiency enhancing projects from private investors such has SMEs and individuals (e.g. house or hotel owners) as well as from public investors such as small municipalities or other institutions undertaking small EE investments. Utilizing energy savings to repay up-front borrowing could benefit from respective loan programs. Projects have to demonstrate alignment with the National Energy Efficiency Plans.

The Intelligent Energy–Europe (IEE, 5.1.2**)** program, launched in 2003 by the EC and open to all Member States, plus some Nordic and CEE countries, is now closed, although a number of projects funded are continuing up to 2017. The program has been substituted by **the Horizon 2020 programme (H2020)** in 2015, with a new EE budget of approximately €194m for 2016 and 2017.

Whilst these programmes mostly financed EE market development initiatives rather than individual retrofits, they both provided a specific technical assistance facility called **ELENA ("European Local ENergy Assistance",** 5.1.3**).** Through **ELENA,** public/private subjects without the necessary technical expertise and organisational capacity to implement large EE/RES projects were granted up to 90% of the technical costs needed to prepare the investment for implementation and financing, including feasibility and market studies, programme structuring, energy audits and tendering procedure preparation.

The Joint European Support for Sustainable Investment in City Areas (JESSICA 5.1.4**)**, jointly managed by the EC, the EIB and the CEB, supports sustainable urban regeneration through financial engineering mechanisms in a set of different areas, among which that of EE improvements. Contributions from the European Regional Development Fund (ERDF) are allocated to JESSICA's Urban Development Funds (UDFs), revolving funds investing in PPPs or other project consortia through equity, loans and/or loan guarantees. The allocation is either direct or via a Holding Fund (HF) and the revolving characteristic allows re-investments of proceedings. An example was the **JESSICA-FIDAE,** a Spanish fund administered by IDAE (Instituto para la Diversificación y Ahorro de la Energía) financing efficiency and renewable energy projects in public buildings. JESSICA-FIDAE was active from 2013 to June 2016 and financed promoters such as public entities, ESCOs and other private companies.

At a national level, multilateral lenders such as KfW (5.1.6) have implemented financing initiatives aimed at promoting small-to-medium scale renewable installations as well as energy efficiency retrofits of existing buildings. In the case of KfW, the Energy Efficiency Programme offers enterprises particularly attractive conditions on loans to finance energy efficient retrofits of commercial-used non-residential buildings and renewable energy installations. This intermediated mechanism (loans are awarded through commercial banks) is open to both private and public subjects, with eligibility criteria and loan amount conditions defined through a benchmark between the performance of the retrofitted building and that required from a new one.

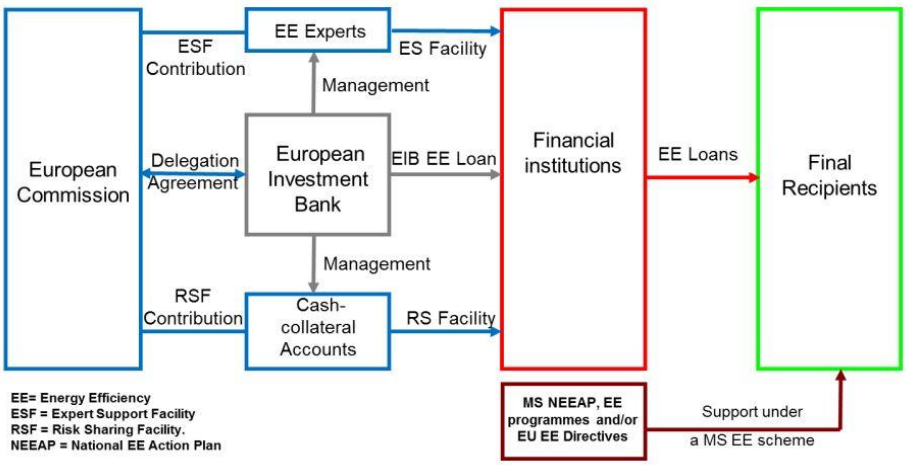
5.1. CASE STUDIES ON INTERNATIONAL FINANCING

Instrument Name	**Country**	**ID**
EUROPEAN COMMISSION - LIFE PROGRAMME ***Private Finance for Energy Efficiency instruments (PF4EE)***	**EU**	**5.1.1**
Instrument Type	**Direct/Indirect**	
Loan Guarantees	**Indirect**	

Instrument Scope

The LIFE programme for the Environment and Climate Action is expanding from providing action grants to projects and operating grants to non-governmental organizations through the Private Finance for Energy Efficiency.
The Private Finance for Energy Efficiency (PF4EE) aims to support Member States in making progress in view of the EU's agreed targets on energy efficiency. The Commission has committed €80 million for 2014-17 anticipating an 8-fold leverage effect. The management of the PF4EE instrument is entrusted to the European Investment Bank (EIB).

The PF4EE will combine lending from the EIB to financial intermediaries with protection against losses associated with making loans for energy efficiency projects. The Financial Instrument will help intermediary banks in Member States to develop and offer specific loan programmes for energy efficiency projects. These loan programs will be aligned with the national energy efficiency action plans. The Financial Instrument will also provide support and technical assistance aiming at effectively deploying the PF4EE Instrument by increasing the technical capacity of the financial intermediaries.

Stakeholders	**Scheme**
Target final recipients for the PF4EE will be: - private investors in Member States investing into energy efficiency enhancing projects; - SMEs and private individuals (e.g. house or hotel owners); - small municipalities or other public sector bodies undertaking small energy efficiency investments, capable of using energy savings to repay up-front borrowing could benefit from respective loan programs; - the European Investment Bank (EIB).	

Description

THE PRIVATE FINANCE FOR ENERGY EFFICIENCY (PF4EE) INSTRUMENT UNDER THE PROGRAMME FOR ENVIRONMENT AND CLIMATE ACTION ("LIFE") WITH RESPECT TO THE FINANCING OF ENERGY EFFICIENCY INVESTMENTS.

The PF4EE instrument's two core objectives are:

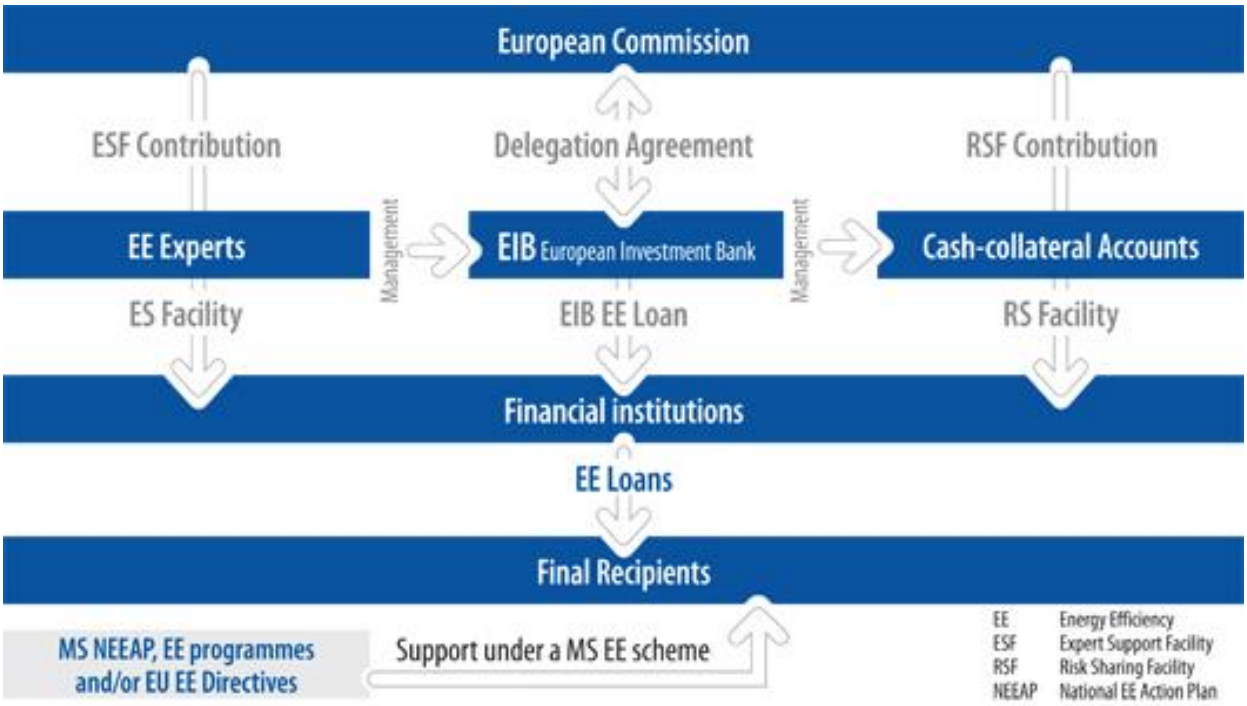
- to make energy efficiency lending a more sustainable activity within European financial institutions, considering the energy efficiency sector as a distinct market segment.
- to increase the availability of debt financing to eligible energy efficiency investments.

The instrument is managed by the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme).

The PF4EE instrument will provide:

1. a portfolio-based credit risk protection provided by means of cash-collateral (**Risk Sharing Facility**), together with
2. long-term financing from the EIB (**EIB Loan for Energy Efficiency**) and
3. expert support services for the Financial Intermediaries (**Expert Support Facility**)

The size of the energy efficiency loans to be provided to the final beneficiaries could range between €40,000 up to €5 million and higher in exceptional cases.



ENERGY EFFICIENCY	
SUB-SECTOR	**CRITERIA APPLIED**
Eligible energy efficiency projects should be justified on the basis of an economic cost-benefit-analysis, for which in general the net present value of the energy saved including externalities, is greater than the net present cost of the project over its life. Where it is difficult to separate out the investments directly related to energy savings, it is necessary to demonstrate that energy efficiency is a significant element of the project. In these cases the energy savings, including environmental externalities, should at least cover 50% of the project cost in an economic analysis. For the following categories of investments additional specific criteria apply:	
District Heating / District Cooling	New systems and the rehabilitation or extension of existing systems are eligible, provided the investment plan for the system ensures heat will be produced mainly from high-efficient cogeneration, residual waste heat or renewable energy. Long-term heat supply costs including all necessary rehabilitation must be economically competitive with heat produced by individual boilers in buildings.
Energy Savings / Energy Efficiency in Buildings	Major renovation of existing buildings as defined in Directive 2010/31/EU (EPBD): Investments shall achieve at minimum the cost-optimum refurbishment level as reported by the Participating Country. Building renovation not subject to the application of the EPBD: For measures at the building envelope, application of minimum requirements (U-values) identified in the definition of cost optimum levels (according to EPBD) Energy related building technologies (i.e. HVAC, control and regulation systems, lighting) must demonstrate economic profitability.
High efficiency Co-Generation of Heat and Power	Primary Energy Savings (PES) to meet criteria for high-efficiency cogeneration according to EU Directive 2004/8/EC methodology, using efficiency reference values given in Council Decision C(2006) 6817. Microgeneration, as defined in the Directive, is eligible.

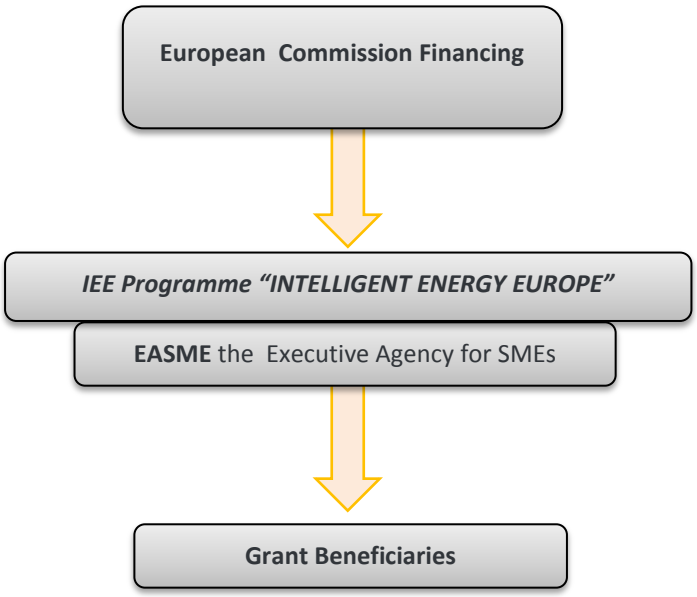
Eligibility/Access Procedure	
Pros/Potential	**Cons/Risks**

Relevant Documentation	**Utilization / Availability Data**
• http://www.eib.org/attachments/documents/pf4ee_request_for_proposals_en.pdf	EUR 80m to fund the credit risk protection and expert support services will be leveraged by the EIB, making a minimum of EUR 480m available in long term financing.

Instrument Name	**Country**	**ID**
EUROPEAN COMMISSION – IEE Programme, INTELLIGENT ENERGY EUROPE	**EU**	**5.1.2**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

Intelligent Energy Europe Delivering shining examples along the road to 2020 Intelligent Energy Europe (IEE) offers a helping hand to private and public stakeholders to make changes and to improve energy sustainability, to support policy development and implementation across Europe, to prepare the ground for investment and to improve the capacity and skills of European market actors.

Stakeholders	**Scheme**
• **Grant Beneficiaries:** can be physical persons, public/private organizations, and not-for-profits.	

Description

(EASME) has been set-up by the European Commission to manage on its behalf several EU programmes.

EASME is managing the Intelligent Energy Europe (IEE) programme that offered a helping hand to organizations willing to improve energy sustainability. Launched in 2003 by the European Commission, the programme was part of a broad push to create an energy-intelligent future for us all. It supported EU energy efficiency and renewable energy policies, with a view to reaching the EU 2020 targets (20% cut in greenhouse gas emissions, 20% improvement in energy efficiency and 20% of renewables in EU energy consumption).

Intelligent Energy Europe has been replaced by Horizon 2020 Energy Efficiency on 1st January 2014 but the latest projects run until 2017.

To ensure that projects which have been awarded an IEE grant live up to their expectations, their management is closely monitored by the Executive Agency for SMEs (EASME), which is the main contact point for project coordinators. This section contains all you need to know about the obligations and formalities to be met at each step of the management cycle.
Each project follows a similar life cycle, beginning with the negotiation of the grant agreement (the 'contract') with the EASME and ending with payment.

Receiving public money for an IEE project means meeting certain obligations in the day-to-day management of a project, for instance as regards technical and financial reporting, and communication. The terms are all clearly laid down in the grant agreement signed by the EASME and the project beneficiaries in order to ensure transparency and accountability.

The section on "Finalizing your grant agreement" will guide you through the different steps of the negotiation process. While information on what is expected of you once the contract has been signed is available at "Day-to-day management". Once a proposal is recommended for funding, project consortia are invited for the finalization phase. In this phase, the EASME will clarify with the project team the detailed technical and financial aspects of the proposal based on the conclusions of the evaluation. This typically takes two to three months.

Eligibility/Access Procedure

The *grant agreement* is signed by the EASME on behalf of the European Commission and by the project coordinator on behalf of all beneficiaries; it is a standard document that cannot be modified. Other services within the European Commission are consulted in order to make sure that the action in question is not already financed by the EU.

The grant agreement sets out the terms of the agreement and details of the project. Two main documents which form an integral part of the agreement: *the description of the action* (Annex I) and the *estimated budget of the action* (Annex II).

During the finalization phase, these documents are finalized on the basis of the comments made by the evaluation committee. All details are listed including amounts, duration, roles and responsibilities of each participant, payment arrangements, reporting conditions, and so on.

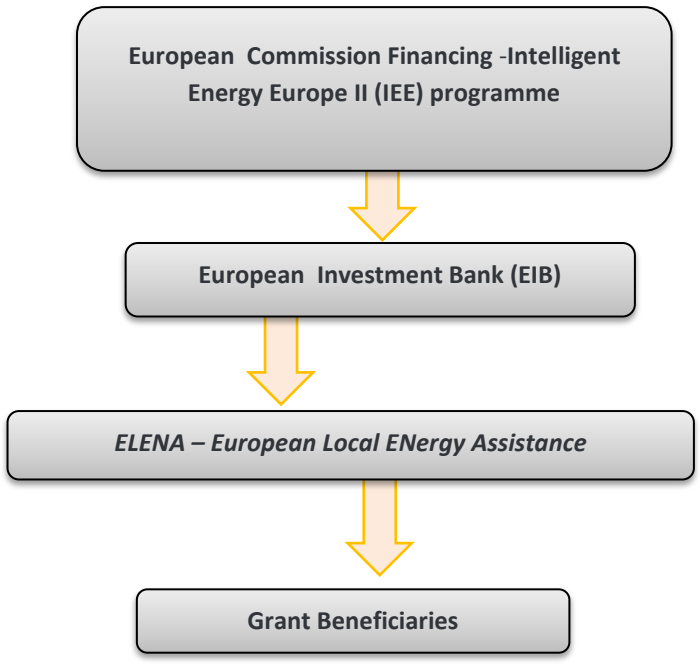
Pros/Potential	Cons/Risks

Relevant Documentation	Utilization / Availability Data
• http://ec.europa.eu/energy/intelligent/files/call_for_proposals/doc/grant_agreement_call_2013.pdf • http://ec.europa.eu/energy/intelligent/files/implementation/doc/guidelines-iee-common-performance-indicators.pdf	

Instrument Name	Country	ID
The European Investment Bank (EIB) "ELENA – European Local ENergy Assistance"	**EU**	**5.1.3**
Instrument Type	**Direct/Indirect**	
Grant	**Indirect**	

Instrument Scope

ELENA is part of the EIB'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. It is on track to mobilise more than EUR 1.6bn in investments over the next few years.
The European Local Energy Assistance (ELENA) facility aims to help public authorities exploit this potential by improving the chances that their plans will be able to attract external finance. Many cities and regions have recently started to prepare major energy efficiency and renewable energy proposals and have signed up to the Covenant of Mayors initiative (www.eumayors.eu), under which they undertake to go beyond the EU's planned 20% cut in CO2 emissions by 2020.
ELENA aims to encourage authorities to think ambitiously and develop energy A programme to save energy in some 300 schools in Paris is also being supported by ELENA. Supporting sound energy investments in cities and regions efficiency and renewable energy projects that can be replicated across the EU.

Stakeholders	Scheme
• **Public authorities** for structuring programmes, business plans and additionally needed energy audits, preparing tendering procedures and contracts, and paying for project implementation units; • **Energy service companies (ESCOs)**	

Description

Funding for ELENA comes from the European Commission's Intelligent Energy Europe II (IEE) programme, with total commitments so far amounting to EUR 49m. The money is used to provide technical assistance to local and regional authorities seeking to implement their energy plans.

ELENA funds can be used for structuring programmes, business plans and additionally needed energy audits, preparing tendering procedures and contracts, and paying for project implementation units. The EU contribution can cover up to 90% of eligible costs.

Investment programmes can involve the improvement of energy efficiency in buildings or street lighting, the integration of renewable energy sources in buildings or the renovation or installation of district heating systems using combined heat and power or renewable sources. Urban transport programmes relating to enhanced energy efficiency, such as the introduction of energy-efficient buses or increased renewable energy use in transport (e.g. infrastructure for alternative fuel vehicles), are also eligible.

The aim is to generate bankable investment projects that can attract outside finance, for example from local banks or other financial institutions, such as the EIB. These projects can also be implemented by energy service companies (ESCOs), which are service providers that guarantee future savings made on energy bills and can fund projects upfront that are refinanced through the savings achieved. The development of ESCOs in Europe is expected to help implement the EU's Energy Services Directive, which obliges public authorities to improve energy efficiency and encourages the use of financial instruments for energy savings, such as third-party financing contracts and energy performance contracts. As the Commission's Energy Efficiency Plan underlines, ESCOs can help public authorities to upgrade buildings by grouping them into scalable projects under energy performance contracts.

Eligibility/Access Procedure

Access is via contact with elena@eib.org . For a first contact, they will need a brief description of the applicant and the planned investment programme. This should include the types of projects, the approach to implementation, and the expected investment cost and time schedule of the programme. The applicant should also give an overview of the main needs and scope to be addressed by the requested technical assistance as well as an indication of the requested amount.

Upon assessment of this information by our team, a formal application can then be submitted.

Pros/Potential	Cons/Risks

Relevant Documentation	Utilization / Availability Data
• http://www.eib.org/products/advising/elena/index.htm • http://www.eib.org/attachments/thematic/elena_en.pdf • http://ec.europa.eu/environment/climat/climate_action.htm	

Instrument Name	Country	ID
JESSICA-FIDAE funds	**Spain**	**5.1.4**
Instrument Type	**Direct/Indirect**	
Soft Loan	**Mixed: Indirect / Direct**	

Instrument Scope

FIDAE funds have the following scope and characteristics.

Project promoters can be public institutions, energy service companies and other private companies.
Projects must be located in one of 8 autonomous communities: Andalusia, Canary Islands, Castilla y Leon, Castilla-La Mancha, Valencia, Extremadura, Galicia, Murcia, and 2 autonomous cities: Ceuta and Melilla.
Projects must be included in any of the following sectors: Edification, Industry, Transport, and Energy Utility.

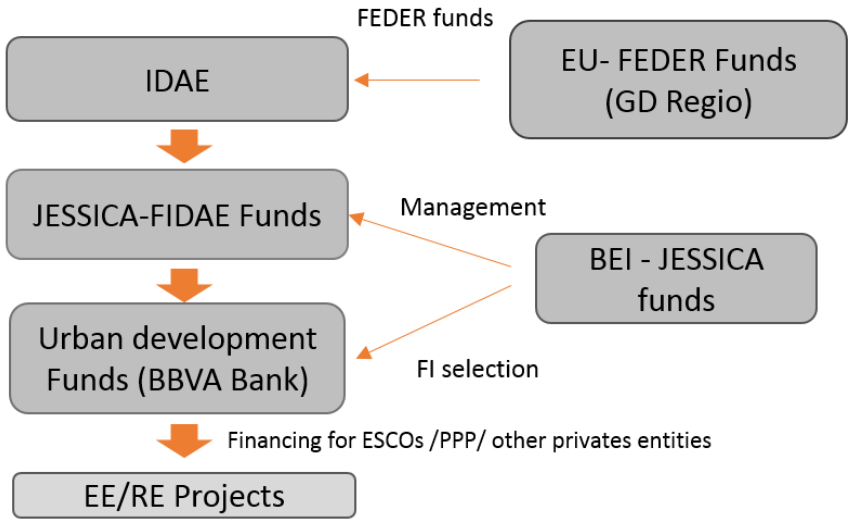
And part of one of the following priority areas:
- Energy efficiency projects and energy management.
- Projects THERMAL, PHOTOVOLTAIC AND BIOMASS ISOLATED.
- Projects related to clean transport and contributing to improve energy efficiency and use of renewable energy.

In addition, projects must:
- Ensure an acceptable return on investment.
- Be included in integrated plans for sustainable urban development, or contribute to their goals without having to be registered or identified therein.
- Not be finalized at the time of receiving funding.

Stakeholders

- **IDAE -** Instituto para la Diversificación y Ahorro de la Energía. Spanish entity which manages the funds coming from FEDER and JESSICA, through the holding fund F.I.D.A.E.
- **BEI –** European Investment Bank, which provides JESSICA funds to IDAE.
- **EU** – European Union through the European Commission.
- **BBVA** – Spanish bank chosen by BEI.

Scheme



Description
F.I.D.A.E. is a fund launched by IDAE (www.idae.es) as intermediate body delegated by the Managing Authority of the European Regional Development Fund – FEDER , which has about 123 M € with the purpose of financing sustainable urban development projects that improve energy efficiency and / or renewable energy projects. This is a fund financed by both the ERDF and the Institute for Diversification and Saving of Energy (IDAE) and operated by the European Investment Bank (EIB). This fund can be compatible with other sources of public or private funding and grants co-financed with European funds or not (except -FSE European Social Fund, Cohesion Fund, European Fisheries Fund - EFF or European Agricultural Development Fund rural - EAFRD, or under other programs operating different ERDF). The BEI has selected three managers to manage the financing to the end users. These managers in Spain are BBVA bank, Santander bank and GED Infrastructure. Specific financial conditions applicable to each project are determined by the managers, in accordance with the provisions of the regulations and the investment strategy of the Fund. In general : - Amount: up to 70 % of eligible expenditure, with the limit of the budget available in each region. - Amortization depending on project need. Up to 15 years, with 3 years of grace period. - Interest rate: Euribor plus spread based on credit rating and guarantees provided. Rates of interest ranging from Euribor to Euribor + 0.75 % + 4 %. Projects in which the recipient of the funding is a public service and have no economic activity : - Amount: up to 100 % of eligible expenditure, with the limit of the budget available in each region. - Interest rate: 0%.
Eligibility/Access Procedure
Investment costs directly related to the renewable energy generation or increased energy efficiency are eligible. It may be considered , in general, the following categories, always depending on the nature of the project : - Construction (conditioning, rehabilitation, civil engineering, etc.). - Land (to be eligible, land acquisitions and real estate must have a direct link between the purchase and the objectives of the operation, up to 10% of eligible expenditure). - Equipment and other items linked directly to the project **ELIGIBILITY** - The beneficiary (natural or legal person who has signed the contract with the manager (FDU)) is required to accredit the eligible costs associated with the project submitted and approved by invoices or any other document of equivalent probative value throughout the implementation of the project and the completion of the same.

- Costs must be made in the territory of the Operational Programs for funding by F.I.D.A.E.
- Expenditure must respect rules on eligible expenditure of the Operational programs FEDER and Cohesion Fund.
- General Eligibility Criteria: investment contribute to decrease energy consumption and/or to increase energy efficiency in the eligible sectors.

The energy savings generated by these investments must justify the less 50% of the cost of the investment, in terms of Net Present Value, and using a discount rate of 5% in real terms (without inflation).
The analysis applies to a period of 15 years or the amount corresponding to the useful economic life of the investment if it is less.

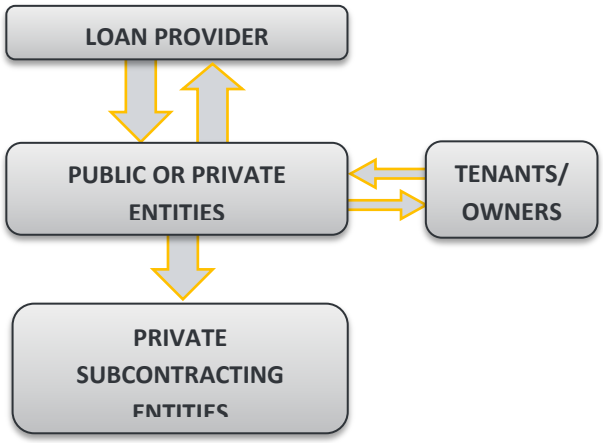
Pros/Potential	**Cons/Risks**
• **Acceptable grace period (3 years),** which means that project promoter, starts to pay the loan after the first 3 years. This definitely promotes project investments. • F.I.D.A.E funds through the mentioned banks give **soft loans, with low interest**. • Acceptable interest rates (0.75-4 % plus Euribor). • Compatible with ESCO business models.	• Project profitability **depending on the Euribor.**

Relevant Documentation	**Utilization / Availability Data**
• http://www.idae.es/index.php/relcategoria.3957/id.833/relmenu.408/mod.pags/mem.detalle • http://www.idae.es/uploads/documentos/documentos_presentacion_jessica_fidae_WEB_oct-15_49aff198.pdf	**123 M€**

Instrument Name	Country	ID
European Investment Bank (EIB) / Nordic Investment Bank (NIB)	**Finland**	**5.1.5**
Instrument Type	**Direct/Indirect**	
Soft loan	**Indirect**	

Instrument Scope

European Investment Bank (EIB) and Nordic Investment Bank (NIB) provide long term loans for both private and public sector projects.

Stakeholders	Scheme
• **Loan provider (EIB or NIB) –** Financing • **Public or private entities –** receiving the loan and subcontracting the works • **Private subcontracting entities –** carrying out the works • **Tenants/owners –** carry some of the costs	

Description

European Investment Bank (EIB) and Nordic Investment Bank (NIB) provide long term loans for both private and public sector projects.
EIB finances projects for sound and sustainable investment projects which make a significant contribution to growth and employment in Europe. EIB activities focus on four priority areas: innovation and skills, access to finance for smaller businesses, environment and climate, and infrastructure.

NIB finances projects that improve competitiveness and the environment of the Nordic and Baltic countries. NIB-financed projects support productivity growth through technical progress and innovation, development of human capital, improvements in infrastructure and increased market efficiency. In terms of the environment, NIB lends to projects that lead to improved resource efficiency, development of a competitive low carbon economy, protection of the environment and its ecosystem services or development of clean technology.

Eligibility/Access Procedure

The subjects that can apply to the scheme are both private and public sector entities willing to develop EE projects.

Pros/Potential	**Cons/Risks**

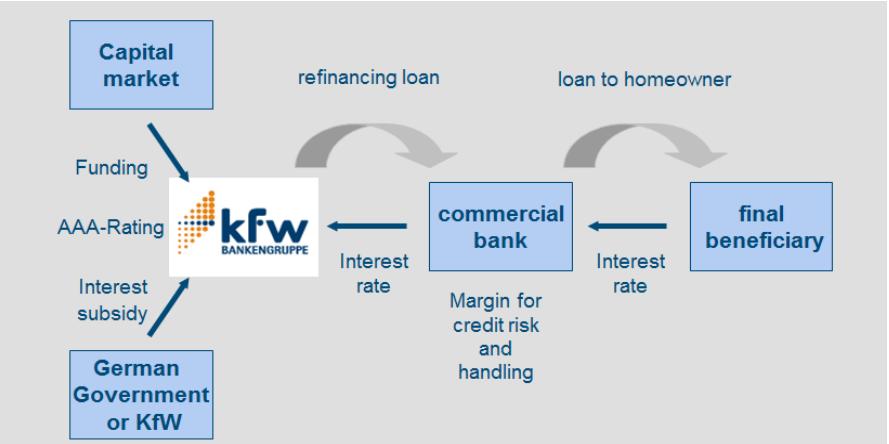
Relevant Documentation	**Utilization / Availability Data**
• http://www.nib.int/nib_in_brief/nordic_investment_bank • http://www.eib.org/about/index.htm	

Instrument Name	Country	ID
KfW - EE Construction and refurbishment Programme - KfW – RES Programme – Standard KfW – RES Programme - Storage	**Germany**	**5.1.6**
Instrument Type	**Direct/Indirect**	
Soft loan	**Indirect**	

Instrument Scope

Scope of this mechanisms are energy efficiency retrofits and renewable energy / energy storage installations supporting the local production of electricity, specifically:

- the Energy Efficient Construction and Refurbishment Programme is targeted to the Energy-efficient refurbishment of commercial buildings for investments having an average value of 25m EUR
- the Renewable Energies Programme deals with renewable energy installations producing electricity, entailing investments up to 50m EUR and with stationary storage systems associated with PV installations.

Stakeholders	Scheme
• **Loan provider (KFW) –** provides funds to Financial Intermediaries (aka commercial banks) • **Commercial Banks –** receiving the loan and transferring the conditions to customers/investing entities **Final beneficiaries –** carrying out the works and repaying the individual loans	

Description
In its EE Construction and Refurbishment Programme KfW provides, through its financial intermediaries (commercial banks), loans for up to 100% of the investment costs, at favourable (that is below-market) interest rates and with the opportunities to obtain a repayment bonus up to 17.5% of the loan amount. Repayment bonuses are progressive with the level of performance reached and conditional to specific performance criteria. Energy-efficient refurbishment of commercial-used non-residential buildings. In particular: refurbished buildings should not exceed a specific energy requirement for a comparable new building, with a stepped level of support: KfW Efficiency House 70 KfW Efficiency House 100 KfW Efficiency House Monument Individual measures to improve the energy efficiency. Also the Renewable Energies Programme finances up to 100% of the investment costs at advantaged rates: in particular, interest rate is fixed for 10 years or longer (20 years in case of storage investments) and enjoys a repayment-free start-up period (but not a repayment bonus).
Eligibility/Access Procedure
The subjects that can apply to the scheme are both private and public sector entities, including (for the Renewable Energies Programme) non-German companies, consortia and investment funds. Whilst the eligibility is quite broad in terms of recipient's requirements, it gets specific when it comes to performance.

Pros/Potential	**Cons/Risks**
•	•

Relevant Documentation	**Utilization / Availability Data**
• https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html • https://www.kfw.de/KfW-Group/Newsroom/Aktuelles/Pressemitteilungen/Pressemitteilungen-Details_287936.html • https://www.kfw.de/KfW-Group/Newsroom/Aktuelles/Pressemitteilungen/Pressemitteilungen-Details_10591.html • http://www.bmwi.de/EN/Topics/Energy/Buildings/kfw-programmes.html • http://www.bmwi.de/EN/Press/press-releases,did=763020.html	• **4.3m dwellings** • **3,800 non-residential retrofits** • **252b EUR invested.** • **8.8m tCO2/y saved for 30 years** • **In April 2016 KfW increased individual project funding limit for residential dwellings**

6. ENERGY PERFORMANCE CONTRACTING

Energy Performance Contracting (EPC) is a contractual arrangement between the beneficiary and the provider, an Energy Service Company (ESCO) for delivering energy efficiency or a renewable energy project, where investments are paid for in relation to a contractually agreed level of energy efficiency improvement. Through this approach the client transfers the technical risks to the ESCO, based on performance guarantees given by the former. In these contracts, the ESCO remuneration is based on a demonstrated performance: the level of energy savings.

The EPC business model can take various forms, depending upon how the Energy Service Company (ESCO) is financed and the range of energy services that are included, but essentially it creates an obligation on the property owner to pay for outsources energy related services which may include retrofitting.

Dimensions of the ESCO contracts can vary, as Sorrell (2005) categorises, according to:

- Scope: the contractor may assume decision rights over a significant proportion of the useful energy streams (e.g. hot water, steam, electricity) and final energy services (e.g. lighting, space heating, motive power) within the host site.
- Depth: the contractor may assume decision rights over a significant proportion of the organisational activities required to provide those streams and services.
- Investment: the contractor may provide new energy conversion, distribution and/or control equipment for the client site.
- Finance: the contractor may finance this investment, or assist in obtaining finance for the client.
- Ownership: the contractor may assume property rights over some of the assets required to provide energy services.
- Guarantees: the contractor may guarantee a particular level of savings in energy consumption or energy costs.
- Risk: the contractor may take on the majority of the risks related to the provision of energy services, including equipment performance risk, energy price risk and credit risk.

Since many of the benefits achievable by an ESCO relate to economies of scale, potential is stronger on larger buildings, and indeed municipalities and public sector buildings have generally been their major clients.

In mature markets, ESCOs are sophisticated project developers responsible for a wide spectrum of tasks. In general they identify, design and finance each project; install and supervise the maintenance of most of the equipment installed; measure and monitor the project's energy savings; and assume the risk that the project will reduce the energy consumption and operating costs at a sufficient level to repay the investment. In order to ensure this, ESCOs must perform a rigorous Measurement and Verification effort on the energy savings, which includes ongoing monitoring over the project's financing repayment term.

The greatest benefit of this model is the ease of selling it to energy end-users because of the "no risk," "no investment" and "paid-from savings" proposition. The EPC model also benefits energy end-users by

eliminating technology risks and avoids doing it themselves. At the same time, the EPC can be designed in various sub-forms. Examples of EPC and other ESCO models are detailed in the APPENDIX 6 following this paragraph.

An EPC may follow the "shared savings" or the "guaranteed savings" models (respectively in 6.1.8 and 6.1.4). This difference between them lies in the distributions of investments, savings and risks between the client and the ESCO.

In the shared savings model, the ESCO provides financing for the investments and the savings are shared. There is no standard split for the share of the savings, as it will depend on the length of the contract, the payback time and the risks taken. This model is more common in a starter market because the clients have limited access to capital, and prefer the ESCO project over own financing.

On the other hand, in projects using the guaranteed savings model the client can usually provide the project budget, through a financing entity or equities. Therefore, the beneficiary will pay the ESCO for the services and performance guarantee, which is usually based on the energy savings.

Another variation is the 'first out' approach (6.1.6) whereby the ESCO is paid 100% of the energy savings until the project costs – including the ESCO profit – are fully paid. The exact duration of the contract will actually depend on the level of savings achieved: the greater the savings, the shorter the contract.

Apart from the EPC there are other contract types which go beyond energy efficiency projects and energy savings guarantees. One of the most common is "Delivery Contracting", (DC), also known as Supply Contracting or Energy Supply Contracting (ESC), which is focused on the supply of a set of energy services (such as heating, lighting) mainly via outsourcing the energy supply. The **Chauffage** arrangement (6.1.9) is the most well-known within this group. In this contract, the fee for the services is normally calculated based on the client's existing energy bill minus an agreed level of savings, with a guarantee of the service provided. Alternatively, the customer may pay a rate per square meter or per kW installed or a fixed fee. In some cases the ESCO may also take over the purchase of fuel and electricity within the same service.

Another new emerging model is Integrated Energy Contracting (**IEC**), which combines both EPC and DC. Within this contract type, projects are designed by planning demand side measures are planned as a priority, and the remaining level of energy needs are covered by energy efficient supply. As IEC is a combination of both contract types, the benefits can reach the highest cost-benefit.

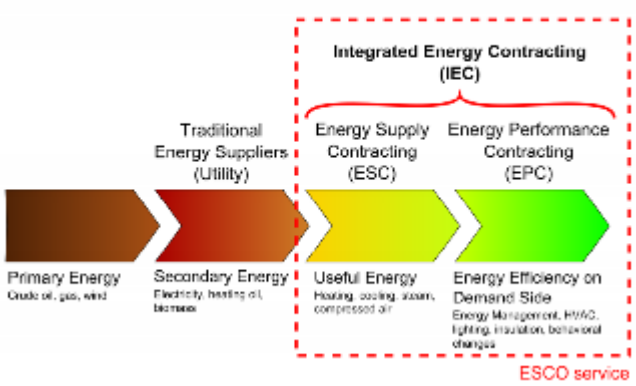


Figure 1: Integrated Energy Contracting. *(Source: EU JRC, 2005)*

Another scheme that can be used by ESCOs is the **BOOT** model (6.1.3), which involves an ESCO designing, **b**uilding, financing, **o**wning and **o**perating the equipment for a defined period of time and then **t**ransferring this ownership across to the client. Clients usually enter into long term supply contracts with the BOOT operator and are charged accordingly for the service delivered; the service charge includes capital and operating cost recovery and project profit. BOOT schemes are becoming an increasingly popular means of financing CHP projects in Europe.

As described before, in ESCO financing, the energy service provider participates with its internal funds and pre-finances the investment and other costs, while in the customer financing model the ESCO does not participate in the financial solution of the project, but instead, its role is restrained to the technical and managerial aspects.

Third-party financing (**TPF,** 6.1.2 and 6.1.5) refers to debt financing. In this scheme, project funds come from a third party, typically a finance institution, and not from equities of the ESCO or the customer. The finance institution then requires collateral in return to the loan. The bank may assume the rights to the energy savings or take a security interest in the project equipment or other property. Regarding the borrower, this can be the ESCO or the client. In the latter situation, the client is secured by the performance guarantee provided by the ESCO, which reduces its financial risk.

In the figure below, the three main models are summarised.

	Balance sheet?	Performance risks	Financial risks	Specific financing
Shared savings EPC	ESCO	ESCO	ESCO	yes
Guaranteed savings EPC	Customer	ESCO	ESCO/ Customer	yes
Chauffage	ESCO	ESCO	ESCO	yes

Figure 2: Division of role and tasks between the ESCO and the client *(Source: EU JRC, 2005)*

The situation in Europe regarding ESCO contracts is quite heterogeneous. In the UK and Ireland, EPC is referred to Contract Energy Management (CEM), which means "the managing of some aspects of a client's energy use under a contract that transfers some of the risk from the client to the contractor (usually based on providing agreed 'service' levels)".

In Nordic countries/Scandinavia, contracts similar to DC are referred to as "comfort contracting" (6.1.1), and in these contracts the provision of the level of comfort or level of service is outsourced to the ESCO firm. These contracts will go beyond the provision of energy for the level of comfort, and take care of full maintenance, including a healthy indoor environment, aesthetics, etc.

In Italy, "chauffage" is equivalent to "heat supply contracts" (or "Servizio Calore" in Italian). These are however substituted by the stricter "Energy Service Plus contracts" ("Servizio Energia plus"). These also include a commitment by the provider to reduce the consumption of primary energy for winter heating by at least 10% with respect to what is indicated in the building certificate. Furthermore, it requires the installation of a temperature control system, when possible.

6.1. CASE STUDIES ON ENERGY PERFORMANCE CONTRACTING

Instrument Name	**Country**	**ID**
Energy Service Contracting (ESCO) in Finland	**Finland**	**6.1.1**
Instrument Type	**Direct/Indirect**	
ESCO/ Service Contracting	**Indirect**	

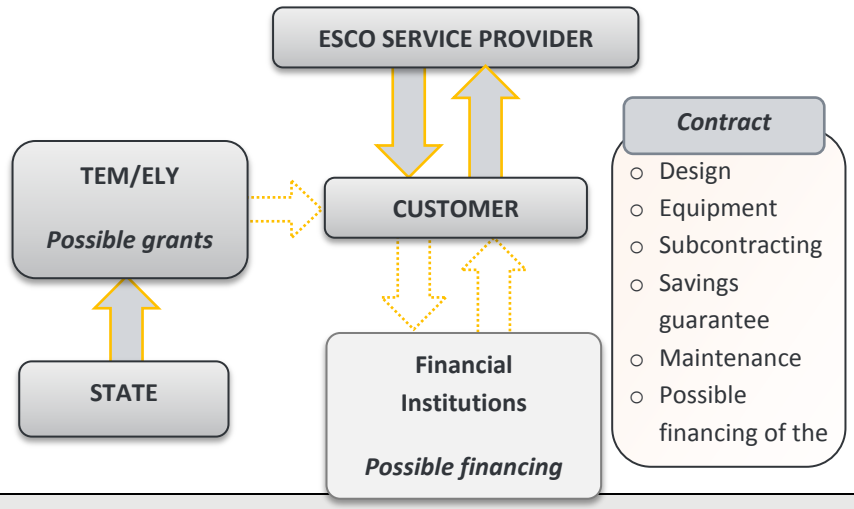
Instrument Scope

ESCO service provider will implement a project to deliver performance/cost reduction for the customer, for example by improving energy efficiency. ESCO organisation guarantees the amount of savings that will be achieved and the customer will repay the project using the savings achieved during the service period. Energy Grant from Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) can be awarded for ESCO projects.

Stakeholders

- **ESCO service provider –** company or contractor providing the ESCO service and implementing the project
- **State –** providing the budget to ELY and TEM
- **Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) –** Disbursing energy grants
- **Customer –** making the ESCO contract and receiving the grants
- **Financial Institutions** – administering the works payments if the customer or ESCO company is not financing the project

Scheme



Description

The customer and the ESCO service provider will make a contract for implementing a project that will deliver performance/cost reduction for the customer. ESCO service provider guarantees the amount of savings that will be achieved per year and the customer will repay the project using the savings achieved during the service period (in Finland usually 4-8 years). ESCO will not receive its payment unless the project delivers the expected performance and savings.

If the delivered savings are smaller than expected, the payment will be smaller. The achieved savings will be verified by metering or calculations, as stated in the ESCO contract.

The customer has several options for financing the project:

- Customer can finance the project or a part of the project
- Customer can use financing institution to get the project funded
- The financing can be provided by the ESCO operator.

The ESCO or the financier is paid the amount of the guaranteed energy savings per year until project costs are fully paid. In Finland, energy Grant from Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) can be awarded for ESCO projects.

Typical ESCO projects in Finland include projects related to energy savings and renovations:

- Renewal of the HVAC systems
- Improving energy efficiency and reducing operational costs
- Heat recovery systems
- Renewable energy

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- ESCO-service is suitable for all kinds of customer groups: construction, industry, service sector, municipalities and other public sector

Pros/Potential	**Cons/Risks**
• The customer does not necessarily need a budget for implementing the project → ESCO service provider can provide financing but customers can also implement the project (or part of the project) using their own budget, if they want • Maintenance contracts can bring even more savings and keep the condition of the building better • The maintenance contracts can be put out for tender after the end of the original contract If savings are not delivered, the customer will not pay the service fee to the ESCO Company. If the delivered savings are smaller than expected, the service fee will also be smaller.	• The ESCO service provider always takes a risk with the savings guarantee → if guaranteed savings are not delivered, the customer will not pay the service fee to the ESCO Company. If the delivered savings are smaller than expected, the service fee will also be smaller.

Relevant Documentation	Utilization / Availability Data
• http://www.motiva.fi/toimialueet/energiakatselmustoiminta/esco-palvelu • http://www.motiva.fi/files/803/esco_opas_23042007.pdf • http://www.motiva.fi/files/7649/ESCO-esite2013_verkko.pdf	

Instrument Name	Country	ID
Leasing contracts - Solar Power Financing	**Finland**	**6.1.2**
Instrument Type	**Direct/Indirect**	
ESCO/Leasing	**Indirect**	

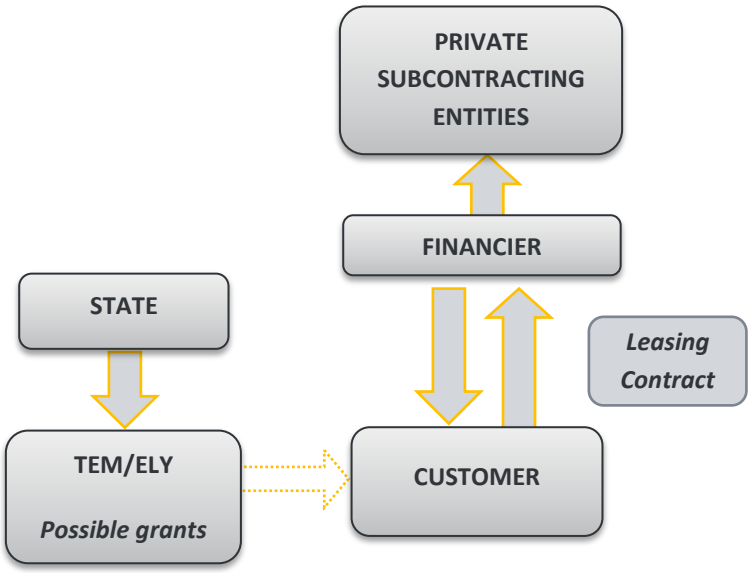
Instrument Scope

There are many companies in Finland providing financing for solar panel investments by making a leasing contract with the customer. Financing is provided for companies or municipalities. Examples of the financing companies include Nordic Shine and Solnet Green Energy. Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) can provide energy grants for solar power leasing projects.

Stakeholders

- **Financier –** company offering leasing contract for the customer and implementing the project
- **State –** providing the budget to ELY and TEM
- **Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) –** Disbursing energy grants
- **Private subcontracting entities –** Carrying out the works
- **Customer –** Company or municipality making the leasing agreement and receiving the grants

Scheme



Description

The leasing company implements the solar panel project and is the owner of the solar panels during the leasing period. The company will also take care of the maintenance of the panels. According to the contract, customer will pay a leasing fee to the company offering the service. The sum of the fee can be equal to the savings customer will achieve, when solar panels are producing the electricity and the customer does not have to buy the electricity from market. After the leasing period, the ownership of the solar plant will be changed to customer (who can pay the residual value) and customer will get the whole benefits from the solar panels.
Finnish Environment Institute (SYKE) started a project in 2016 inviting all Finnish municipalities, and companies owned by the municipalities, to join a leasing programme. After the registration time has ended, the Finnish Environment Institute will put the leasing service out for tender and the solar panels will be installed by the end of the year 2016.

Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) can provide energy grants for solar power. The amount of the grant is 25 %.

Eligibility/Access Procedure

The subjects that can apply to the scheme are:

- Companies
- Municipalities

Pros/Potential	Cons/Risks
• The customer does not need to invest for the project or take care of the maintenance costs • Energy grant from Centre for Economic Development, Transport and the Environment (ELY) and Ministry of Economic Affairs and Employment (TEM) can make the leasing period shorter	

Relevant Documentation	Utilization / Availability Data
• http://nordicshine.fi/rahoitus/ • http://www.syke.fi/fi-FI/SYKE_Info/Viestintaaineistot/Tiedotteet/Yhteishankinnalla_aurinkovoimaloita_kaik%2838378%29 • http://www.finsolar.net/aurinkoenergian-hankintaohjeita/aurinkoenergian-palvelu-ja-rahoitustarjonta/ • http://www.motiva.fi/ajankohtaista/muut_tiedotteet/2016/syke_yhteishankinnalla_aurinkovoimaloita_kaikkiin_manner-suomen_kuntiin.8309.news	

Instrument Name	Country	ID
BOOT (Build-Own-Operate-Transfer) contract	**Spain**	**6.1.3**
Instrument Type	**Direct/Indirect**	
ESCO/Project Financing	**Direct**	

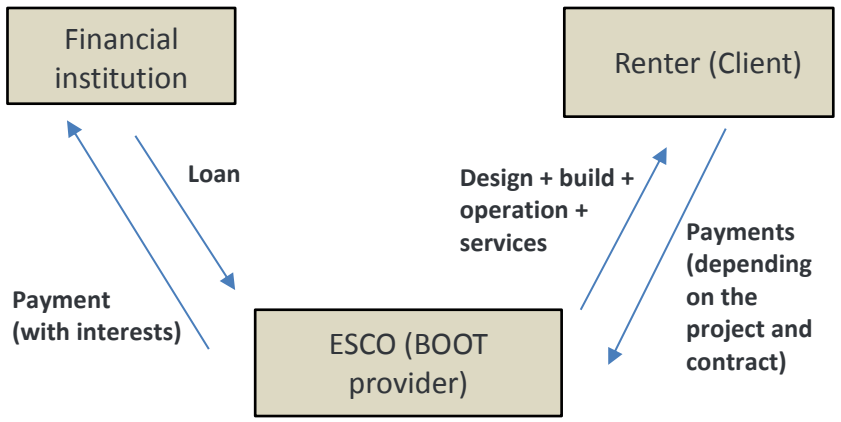
Instrument Scope

Financing arrangement in which a developer designs, builds, owns and operates a complete project as a business for a specified period (usually 10 to 30 years), after which it transfers it to the client/user at a previously agreed-upon or market-price.
Through a BOOT model, the ESCO may transfer the equipment ownership across to the client after contract´s life. This model resembles a special purpose enterprise created for a particular project. Clients enter into long term supply contracts with the BOOT operator and are charged accordingly for the service delivered; the service charge includes capital and operating cost recovery and project profit. BOOT schemes are becoming an increasingly popular means of financing CHP projects in Europe.

Stakeholders

- **BOOT provider:** the third party company which carries out the project and measure the savings, charging a fee for the service (ESCO).
- **Financial entity:** Entity which finances the project (in case the client does not use their own equities).
- **User/Client**: public administration, large companies, industries.

Scheme



Description

Build–own–operate–transfer (BOOT) is a form of project financing, wherein a private entity receives a concession from the private or public sector to finance, design, construct, and operate a facility stated in the concession contract
This enables the project proponent to recover its investment, operating and maintenance expenses in the project.

Due to the long-term nature of the arrangement, the fees are usually raised during the concession period. The rate of increase is often tied to a combination of internal and external variables, allowing the proponent to reach a satisfactory internal rate of return for its investment.

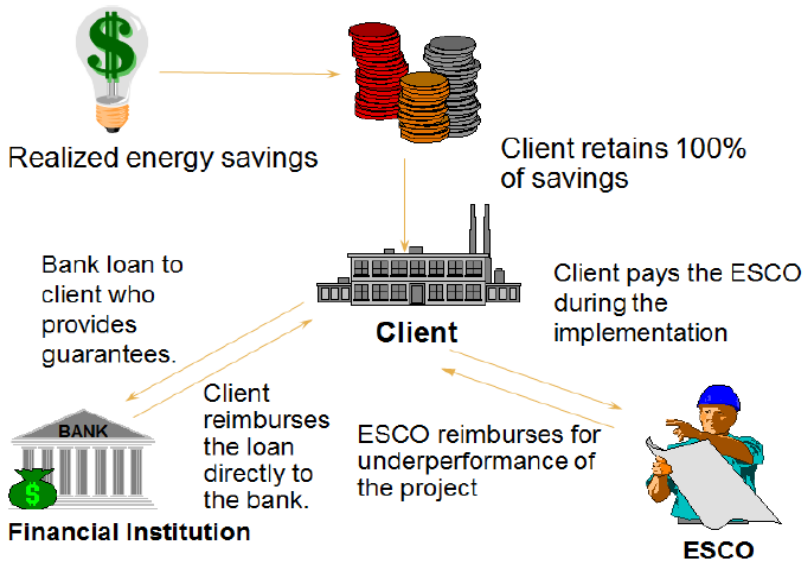
Eligibility/Access Procedure	
Not applicable.	
Pros/Potential	**Cons/Risks**
• The majority of **construction and long-term operating risk** can be transferred onto the BOOT provider (ESCO). • Using an output based purchasing model, the tender process will encourage maximum innovation allowing the most efficient designs to be explored for the scheme. This process may also be built into more traditional tendering processes. • **Accountability for the asset design, construction and service delivery** is very high given that if the performance targets are not met, the operator stands to lose a portion of capital expenditure, capital profit, operating expenditure and operating profit. • BOOT operators are experienced with management and operation of infrastructure assets and bring these skills to the scheme. • Corporate structuring issues and costs are minimal within a BOOT model, as project funding, ownership and operation are the responsibility of the BOOT operator. These costs will however be built into the BOOT project pricing.	• • BOOT is a new concept internationally, with short record in Europe. • Management and monitoring of the service level agreement (operating contract) with the BOOT operators can be time consuming. Procedures need to be in place to allow users to assess service performance and penalise the BOOT operator where necessary. This is particularly the case with maintenance requirements. The users do not want to take over an asset at the end of the operating period that has no useful life remaining and high deferred maintenance requirements. • A rigorous selection process is required when selecting a BOOT partner. Users need to be confident that the BOOT operator is financially secure and sufficiently committed to the market. •
Relevant Documentation	**Utilization / Availability Data**
• http://mbaforum.ir/download/mba/pm/6th/322.pdf • http://ppp.worldbank.org/public-private-partnership/agreements/concessions-bots-dbos	

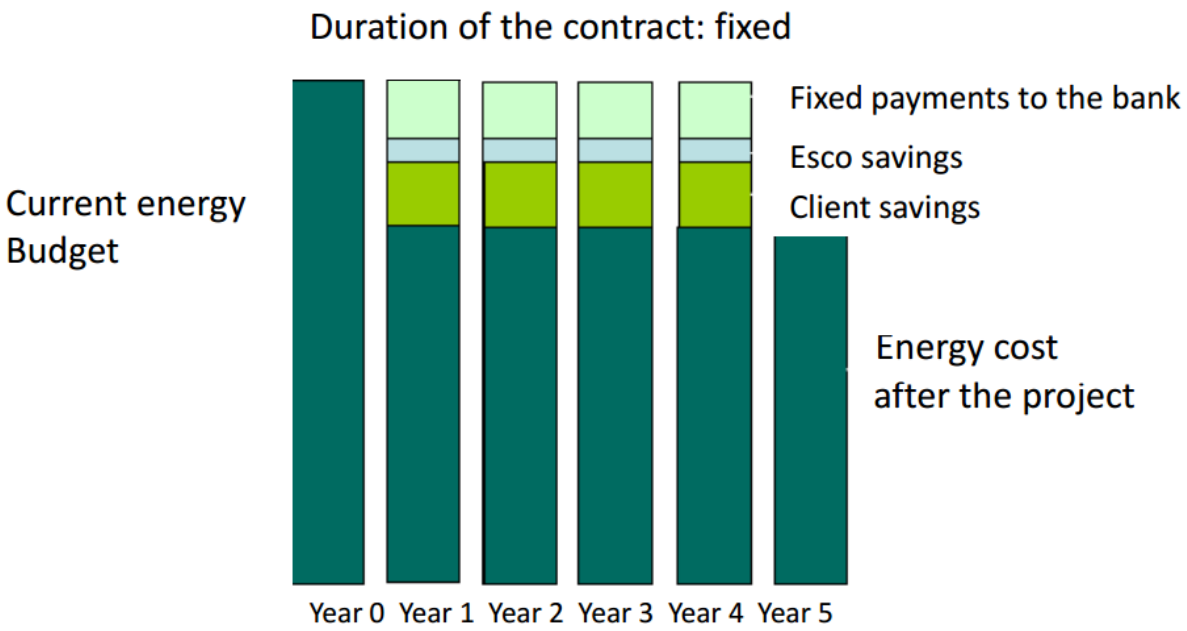
Instrument Name	Country	ID
Guaranteed savings EPC contract	**Spain**	**6.1.4**
Instrument Type	**Direct/Indirect**	
ESCO/Financial model	**Indirect**	

Instrument Scope

Under a guaranteed savings contract, the ESCO carries the entire performance and project risk, the FI assumes the credit risk and the customer assumes the repayment risk. When savings fall short in servicing debt, the ESCO has to cover the difference, whereas when savings exceed debt service, an agreed upon percentage of the excess goes back to the ESCO. A contract normally also contains a threshold level of energy price below which the guarantee is null or may present the variation of a repayment schedule based on the level of savings.

Both ESCO and the user agree on the savings which are guaranteed. They also agree upon an estimated escalation of future utility costs over the term of the contract. A typical division of the value of future savings would be 85% for the ESCO and 15% for the Owner. The ESCO can define a payment structure where their sole compensation is a share of the utility cost savings, based on a percentage split. The ESCO would receive the largest share in the beginning due to its up-front investment; but, the ESCO share may decrease over time depending upon the term of the agreement and the escalation rates which actually occur during that term.

Stakeholders	Scheme
• **ESCO:** the third party company which carries out the project and measure the savings, charging a fee for the service. • **Financial entity:** Entity which finances the project (in case the client do not use their own equities) • **User/Client**: public administration, large companies, industries.	

Description
In developed markets, energy end-users have been interested in the model where the ESCO provides a performance guarantee to them. Within it, the project savings will be able to cover all the related project costs, including debt service to the lender, M&V fees to the ESCO and any other incremental costs (maintenance, etc.) incurred by the project, over a certain period of time. If the achieved savings fall short of the ESCO guaranteed savings amount, the ESCO will reimburse the energy end-user for such shortfall. If the realized savings exceed the guaranteed savings amount, the ESCO may share a portion of the excess, with the amount depending on the risk taken and the extent of ongoing services provided by the ESCO. The significant characteristics of guaranteed savings can be summarized by the following: • The amount of energy saved is guaranteed, as long as the operation remains similar to the period preceding the project implementation; • Value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price; • End user carries the credit risk; • Risks to ESCOs are lower than with shared savings; • Less of the project investment goes to financing costs.   
Eligibility/Access Procedure
Not applicable.

Pros/Potential	Cons/Risks
All pros and cons are considered under the user perspective, looking for its benefits. • The ESCO guarantees that the savings from the project will be enough to cover its costs. **The unfulfilled savings are paid by the ESCO.** • **Percentage distribution** of the value of consumption savings is agreed upon in advance and documented in the contract. • **User will not pay more for utilities than it is stipulated in the contract**. Without a contract the user will face the full impact of rising utility rates. With a shared savings or guaranteed savings contract that risk will be mitigated to some degree due to lower consumption, but not eliminated. • If no consumption savings, user pays energy bill and owes ESCO nothing for that period. • As is the user who finances the project, **ESCO utility services will be lower** than shared savings because user is not charged with costs and interests associated to the loan. • Guaranteed savings contracts are less complex than shared energy savings ones. • Depending on the agreement, **at end of the contract the equipment Ownership transfers to Owner**.	• ESCO may receive a higher percentage of the savings at the beginning of the contract term. This is very likely due to the higher cost of financing. • **User may need to provide for savings measurement and verification** and continuous commissioning to ensure that savings and equipment performance levels are achieved. • May need to utilize innovative structures such as “split incentive”. • **ESCO does not take the financial risk of the investment**, because in that model the user is the party that finances the project. ESCO then takes the performance and technical risks.

Relevant Documentation	Utilization / Availability Data
• https://www.gov.uk/government/publications/energy-performance-contract-epc • https://ec.europa.eu/energy/intelligent/in-action/energy-performance-contracting/	

Instrument Name	Country	ID
Operational/Capital Leasing contract	**Spain**	**6.1.5**
Instrument Type	**Direct/Indirect**	
ESCO/Project Financing	**Indirect**	

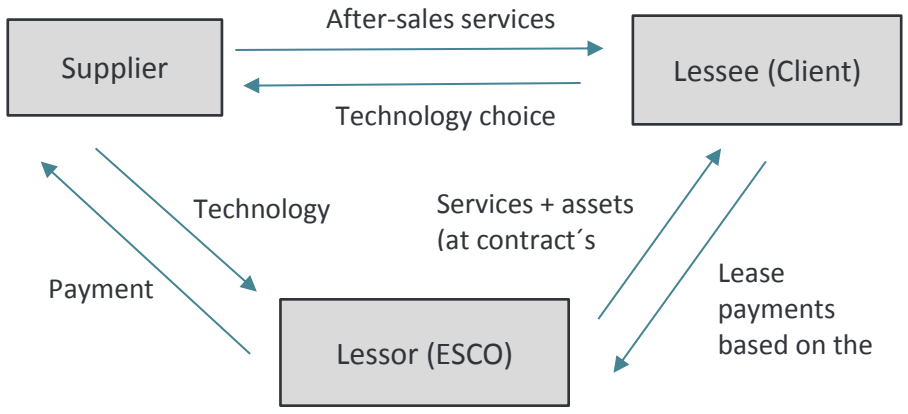
Instrument Scope

Leasing is a way of obtaining the right to use an asset – not the possession of the asset. Assets in this case mean investments into energy conservation measures. When leasing an energy conservation investment, user does not buy it, they only pay for the exclusive right to use it.

Leasing is a contract between the owner of the asset (lessor/ESCO) and the user (lessee/client), wherein the former grants exclusive rights to use the assets for a certain period (basic lease term), in return for payment of a lease. Basically, there are two types of leases, which are relevant for Energy-Contracting: operate and finance leasing.

In capital lease, the lessee (customer) owns and pays the ESCO for its service with the cost savings, the ESCO in turn arranges a lease/purchase agreement with a financing institution.
In operating lease, the ESCO rents the service to the lessee (customer) for a fee in an off-balance sheet operation, shifting the risk away from the customer and claiming tax benefits associated with depreciation.

Leasing can be an attractive alternative to borrowing because the lease payments tend to be lower than the loan payments.

Stakeholders	Scheme
• **Lessor (ESCO):** the third party company which buys the technology from the supplier, develops the project and offers services to the client (lesser). It is the asset owner. • **Supplier:** Technological provider. • **Lessee:** the property which pays the Lessor (ESCO) for the asset and services and owns the system at contract´s end.	

Description	
A leasing contract has the following characteristics: - The ESCO finances the equipment and the installation (through a bank loan or equities). - Leasing contracts are regulated and have a maximum duration of two years. - After the contract, the client has purchase option. - Allow for financing at 100%. Leasing contracts works as follows: the ESCO installs, for example, a solar PV system, and the client makes monthly repayments on the system for a period of time, commonly five to 10 years. The repayments can be a flat monthly rate, or increase fractionally during the course of the contract. The ESCO is generally responsible for the maintenance of the system while client´s in its leasing period. This allows users to spread out the cost of a solar installation – but it locks them into repayments with interest that will effectively make the system more expensive. There are different models for solar leasing contracts. Usually the ESCO transfers ownership of the PV system to the client at the end of the lease, while in other cases the ownership of the system will revert to the ESCO. The client may have the option to buy the system by paying off a residual cost.	
Eligibility/Access Procedure	
Not applicable.	
Pros/Potential	**Cons/Risks**
To Lessor (ESCO): The advantages of lease financing from the point of view of lessor are summarized below. • **Assured Regular Income**: Lessor gets lease rental by leasing an asset during the period agreed in the contact. • **Preservation of Ownership**: In case of finance lease, the lessor transfers all the risk and rewards incidental to ownership (to the lessee) without the transfer of ownership of asset, hence the ownership lies with the lessor. • **Benefit of Tax:** As ownership lies with the lessor, tax benefit is enjoyed by the lessor by way of depreciation in respect of leased asset**.** • **High Profitability:** The business of leasing is highly profitable since the rate of return based on lease rental, is much higher than the interest payable on financing	**To Lessor (ESCO):** Lessor suffers from certain limitations which are discussed below: • **Unprofitable in Case of Inflation:** Lessor gets fixed amount of lease rental every year and they cannot increase this even if the cost of asset grows. • **Sales tax may be charged twice:** First at the time of purchase of asset and second at the time of leasing the asset. • **Greater Chance of Damage of Asset:** As ownership is not transferred, the lessee uses the asset carelessly and there is a great chance that asset cannot be useable after the expiry of primary period of lease.

the asset.

- **Recovery of Investment:** In case of finance lease, the lessor can recover the total investment through lease rentals.

To Lessee (Client): The advantages of lease financing from the point of view of lessee are discussed below:

- **Use of Capital Goods:** A business will not have to spend a lot of money for acquiring an asset but it can use an asset by paying small monthly or yearly rentals.
- **Tax Benefits:** A company is able to enjoy the tax advantage on lease payments as lease payments can be deducted as a business expense.
- **Cheaper:** Leasing is a source of financing which is cheaper than almost all other sources of financing.
- **Technical Assistance:** Lessee gets some sort of technical support from the lessor in respect of leased asset.
- **Inflation Friendly:** Leasing is inflation friendly, the lessee has to pay fixed amount of rentals each year even if the cost of the asset goes up.
- **Ownership:** After the expiry of primary period, lessor offers the lessee to purchase the assets— by paying a very small sum of money

To Lessee (Client):

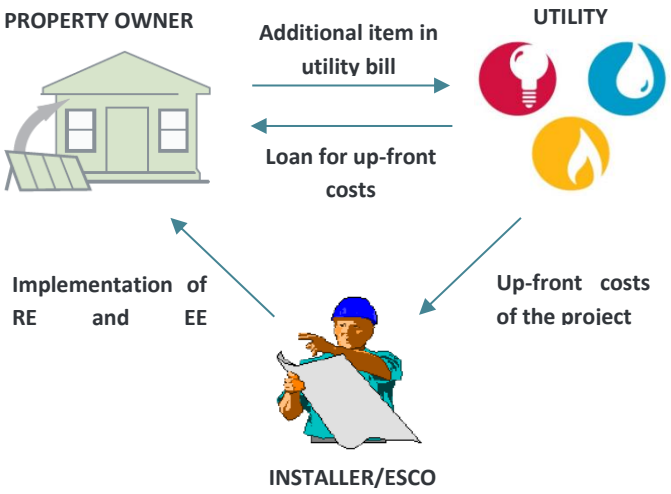
- **Compulsion:** Finance lease is non-cancellable and even if a company does not want to use the asset, lessee is required to pay the lease rentals.
- **Ownership:** The lessee will not become the owner of the asset at the end of lease agreement unless he decides to purchase it.
- **Costly:** Lease financing is more costly than other sources of financing because lessee has to pay lease rental as well as expenses incidental to the ownership of the asset.
- **Understatement of Asset:** As lessee is not the owner of the asset, such an asset cannot be shown in the balance sheet which leads to understatement of lessee's asset.

Relevant Documentation	Utilization / Availability Data
• https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/eurocontract_epc_financing_manual_en.pdf	

Instrument Name	Country	ID
On-Billing financing model	**Spain**	**6.1.6**
Instrument Type	**Direct/Indirect**	
ESCO/Financial model	**Indirect**	

Instrument Scope

In On-Billing financial model, utilities provides financing for RE and EE measures in a building. Property owners repay this loan through an addition in their utility bill. However, the overall utility bill should still be lowered because of the associated energy cost savings. In addition, it is possible to structure the programme in a way that the loan is transferable to the next owner if the home or building is sold.

Stakeholders	Scheme
• **Utility:** public service provider who carries out the project. • **Users**: Property owners who repay the investment through an increase in their utility bills. • **Installer/ESCO:** the third party company that carries out the project and gets paid directly.	

Description

Generally, when applying on-billing financing, the aim for the investments in RE and EE measures is to generate annual cost savings for the property owner. Thus, the repayment period vary depending on the expected energy savings and the useful life of the installed equipment.

Before the application of an on-billing programme, it is important to perform an energy audit of the property, because only cost-effective RE and EE measures are financed. On-billing financing programmes are often combined with grants to enable a wider range of measures to be cost-effective.

In addition to the administration of the programme, the utility also finances the investments from its own capital, although it is possible to combine utility own funds with public or private sources of financing.

There are different types of on-bill financing programmes: *on-bill tariff* and *on-bill loan*.

- With an on-bill loan programme, a personal loan is issued to the building owner, repaid as a line-item on the utility bill. This loan is legally not linked to the property or the utility meter.

- With the on-bill tariff programmes, the property owner repays the loan through an addition in the utility bill, but it is considered as an 'essential service', and the obligation for payments remains with the property, and it is transferred to the next owner in the case the building is sold. For this last type of programmes, the payback period of the loan is stretched to about 10 years. The obligation for payments stays with the property and is transferred to the next owner in the case of sale of the property as with PACE financing.

Eligibility/Access Procedure

Freestanding residential houses and small commercial buildings are the main candidates for these programmes. It is applicable for owner-occupied buildings, but can also work for renter occupied buildings, as the concept may allow tenants to pay for (via the utility bill) and profit from energy efficiency improvements.

Pros/Potential	**Cons/Risks**
For the property owner: • On-bill financing gives customers the opportunity to finance energy efficiency improvements in their homes and businesses at no upfront cost. • Generally, there are net energy cost savings for the building owner just after the installation of RE and EE measures. • Savings are paired directly with repayment on same bill. • Provides a secure revenue stream because failure to pay can be tied to disconnection. • In an on-bill tariff programme, the liability stays with the utility meter For the utilities: • In on-bill tariff programmes, utilities can disconnect customers from utility services in case of default on the loans. • Linking payments to utility bills offers a relatively secure way of recovering the loan. • An on-bill financing programme may be a way to increase customer retention in liberalized markets.	For the property owner: • If transferability is not allowed, businesses or homeowners must pay off entire loan upon sale of property. For the utilities: • Utilities are often reluctant to take on role of financing entity. • Require approval of the regulator for the new tariff structure. • Limited to measures that are cost-effective over 5-10 years.

Relevant Documentation	Utilization / Availability Data
• https://www.ecn.nl/docs/library/report/2012/e12014.pdf • http://energy.gov/eere/slsc/bill-financing-and-repayment-programs • http://www.renewableenergyworld.com/ugc/blogs/2011/12/on-bill-financing-why-isnt-everybody-doing-it.html	

Instrument Name	Country	ID
Renting contract	**Spain**	**6.1.7**
Instrument Type	**Direct/Indirect**	
ESCO/Financial model	**Indirect**	

Instrument Scope

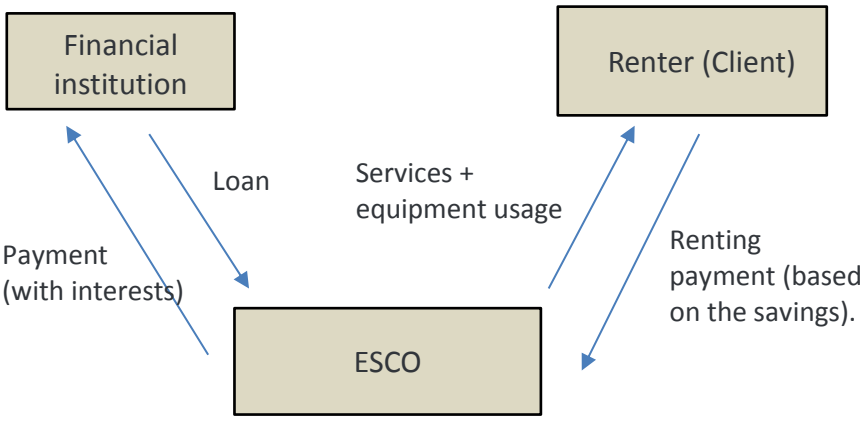
Renting model is a contract to rent real state and its corresponding services, which allows the usage of these goods without acquiring it through an agreed fix rate during the contract period.

Stakeholders

- **ESCO:** the third party company which finances and implements the project and charges a fee to the client.
- **Financial entity:** Entity which provides funds for the ESCO (in case the former do not use their own equities)
- **User/Client**: public administration, large companies, industries.

Scheme

This scheme is considered under the statement that the ESCO does not use its own equities:



Description

Contract characteristics are as follows:

- The ESCO buys the equipment and install it for client usage, and the client pays a fee for the renting. The ESCO keeps the property.
- These contracts are free and deregulated.
- As they are open, everything (coverages, services, duration, penalties and so on) need to be agreed and detailed in the contract.
- There is not purchase option.

Renting contracts are suitable when:

- The initial investment is unaffordable for the client.
- The client requires a comprehensive pack of services related to the facility.
- Both.

The ESCO makes the investment, through equities or a bank loan, and charge a fix renting rate during the contract. That fix rate could be linked to the savings, corresponding to an ESCCO model.

Eligibility/Access Procedure

Not applicable.

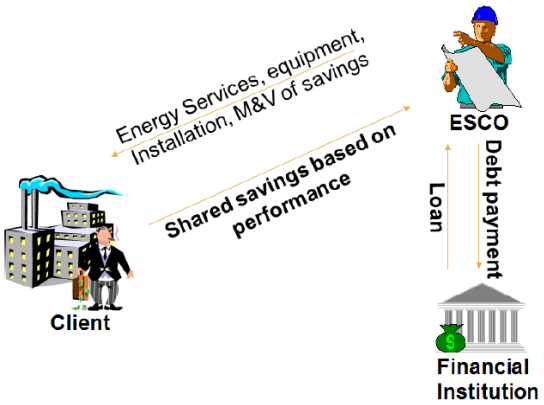
Pros/Potential	**Cons/Risks**
From the user perspective, there are the following advantages: • It allows for using a good without increasing the Company debt or decrease treasury positions. • As the user does not have a financial burden, the contract is not affected by interest fluctuation rates. This issue is greater as the project investment increase. • This renting type is considered as a tax-deductible expense, as long as renting goods are included in the Company´s business usual activity.	Typical mistakes taken in these contracts are as follows: • Set a contract duration close or superior to good lifespan. • Possible discrepancies between the client and the ESCO for not clarifying some services in the contract (like replacement). • There is not purchase option. This makes confusion in some cases because the client might think that he/she is buying the equipment on credit. • There is no regulation for this type of contracts, this might mean high payment rates. • Although it is not a loan or credit, the risk measurement is similar. Then it is possible to require guarantees, deposits and so on. • In some cases, renting contracts evolve towards leasing ones. That might be a problem because the former are regulated and then are exposed to be audited, while renting is an agreement between two parties.

Instrument Name	Country	ID
Shared savings EPC contract	**Spain**	**6.1.8**
Instrument Type	**Direct/Indirect**	
ESCO/Financial model	**Indirect**	

Instrument Scope

Under a shared savings the client takes some performance risk, the FI and the ESCO share credit risk (through TPF or with other mixed scheme), and the ESCO assumes repayment risk. The ESCO collateralizes the loan with anticipated savings payments from the customer, based on a share of the energy cost savings and enters the financing in its balance sheet.

In a shared-savings EPC, the ESCO finances the total upfront capital cost of the project and is totally responsible for repaying the lender. The client pays the ESCO a percentage (or it can be a fixed amount) of its achieved savings from the project, large enough for the ESCO to repay the project investment to its lenders, cover M&V costs and any other associated costs. The energy-end user assumes no direct contractual obligation to repay the lender, only the ESCO has this obligation.

Stakeholders	Scheme
• **ESCO:** the third party company which carries out and finance the project, and measure the savings, charging a fee for the service. • **Lending institution:** Entity which lend the project fund (in case the ESCO does not use their own equities) • **User/Customer**: public administration, large companies, industries.	

Description

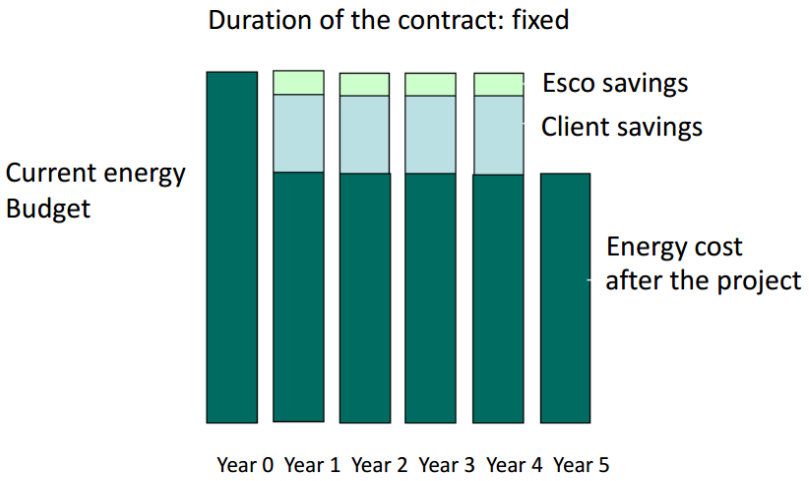
The shared-savings approach typically requires an equity investment, which in combination with the higher risk assumed by the ESCO carries a higher capital cost than the guaranteed savings structure.

The primary characteristics of shared savings can be summarized by the following:

- The energy end-user and the ESCO share a predetermined percentage of the energy cost savings.
- ESCOs carry both the performance risk and the credit risk.
- Financing for energy end-users does not negatively impact their credit capacity and can be off balance sheet.
- The equipment is “owned” by the ESCO for the duration of the contract (ownership is usually transferred to the owner at contract end).

- Increased risks associated primarily with energy end-user repayment causes the cost of money to be higher. As the entire project payments are recognized as a service cost, they are fully deductible for tax purposes in many countries for the duration of the agreement.

ESCO gets the funds from an FI and charges a fee to the user based on the savings. That fee should cover all expenses and loan interests. Then ESCO has two contracts/agreement, one with the FI and other with the user.



Eligibility/Access Procedure

Not applicable

Pros/Potential	**Cons/Risks**
• User gets the immediate **advantage of consumption savings without making capital investment or assuming debt**. • **ESCO provides financing** as well as **project development and implementation costs.** • **Once contract** deadline **is past**, the client receives the **total benefits of the savings achieved**.	• **User may need to provide for savings measurement and verification** and continuous commissioning to ensure that savings and equipment performance levels are achieved. This is actually more important in shared savings agreements as users are incentivized to claim consumption savings shortfalls so their payment obligation to the ESCO is lower. • **User will pay higher** (non-tax exempt) **interest rates by relying on ESCO financing** which can be two to three times higher than tax exempt rates. • **User's share may be smaller than in a guaranteed savings contract.** • The main risk to account for is the **ESCO attempting to lower savings' estimates and to capitalize from 'excess savings'** (pricing risk is addressed by fixing the contract's energy price).

	• **The user will bear the interest rate risk** because it is a pass through cost. Shared savings does not insulate users from utility rate risk, ESCO will agree to a fixed share of savings, but the value of consumption savings increases as utility rates escalate.

Relevant Documentation	Utilization / Availability Data
• https://www.gov.uk/government/publications/energy-performance-contract-epc • https://ec.europa.eu/energy/intelligent/in-action/energy-performance-contracting/	

Instrument Name	Country	ID
Chauffage Contract	**Spain**	**6.1.9**
Instrument Type	**Direct/Indirect**	
ESCO/Financial model	**Indirect**	

Instrument Scope

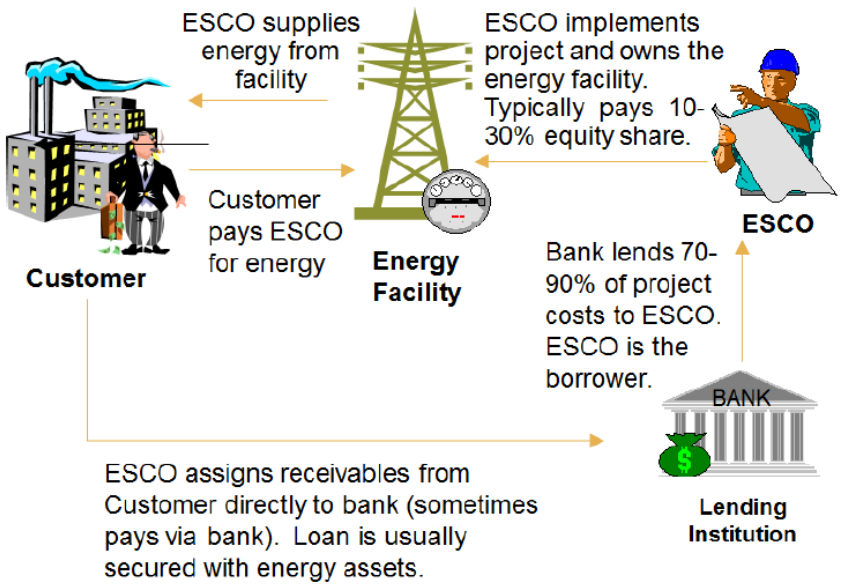
The ESCO takes care of the fuel purchases, production, delivery and user-side technical installations. The scope can of course vary between different companies, markets etc.

When it comes to the demand side energy usage, the chauffage contract form is generally mostly geared towards the technical installations (customer side installations concerning heating, cooling, ventilation, electricity, water, sewerage), things that are not that "visible" to the customer. When it comes to demand side EE measures which demands more customer involvement ("building" measures), such as switching lighting technology, windows, insulation, user behaviour etc. the ESCO might provide more of a consultation role, typically on a yearly basis. Again, the scope varies between different ESCOs.

Stakeholders

- **ESCO:** the third party company which carries out the project and measure the savings, charging a fee for the service.
- **Lending institution:** Entity which finances the project (in case the client do not use their own equities)
- **User/Customer**: public administration, large companies, industries (large scale energy end-users).

Scheme

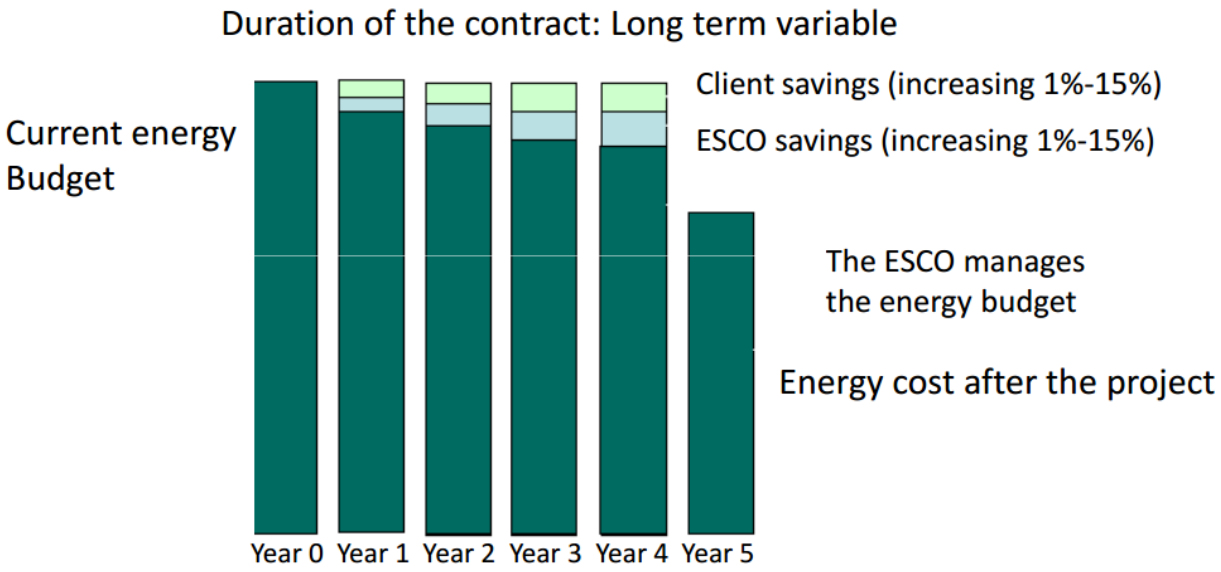


Description

In this type of financing agreement, the ESCO assumes responsibility for paying the energy bills of the facility over the term of the agreement. The facility owner pays the ESCO a specified percentage of the previous energy costs (per energy unit consumed, per square metre, etc.) that would have been incurred, discounted from an agreed base year of energy costs (e.g.,

historical energy costs minus a discount of up to 15%).

On a financing basis, financing is done through the ESCO whereby the financing institution takes the long-term contract with a strong client as the main collateral for the loan.



The base year is developed and agreed to by both parties at the time of contract signing taking into consideration use, occupancy, unit energy costs and many other factors affecting total energy costs.
A chauffage contract is usually very extensive, often involving a thorough energy management plan, including retrofits and maintenance. It is generally considered **appropriate only for large-scale energy end-users whose facilities feature substantial potential savings (e.g., hospitals, universities and large office buildings)**. This kind of agreement is often used in Europe to contract municipal services. The length of a chauffage contract is usually long, ranging from 10 to 25 years.
From the payments received, the ESCO must recover all of its expenses for equipment and services as well as pay the energy bills. The ESCO's gross margin is derived from the difference between the payment it received from the customer and the reduced energy costs it pays to the utility. The ESCO must reduce actual energy costs significantly below what it charges. Its profit equals this gross margin minus the costs to design, install and maintain the retrofits.

The facility owner is able to budget utility costs with absolute certainty throughout the term of the contract and is assured of a positive cash flow during the term. This cash flow would most likely be less than that in a shared-savings arrangement as the ESCO assumes more risk.

As in a shared-savings contract, the facility owner would have little incentive to invest in savings without a separate energy use 'score' being kept. Hence, there is a tendency to opt for lower capital cost improvements.
In practice, ESCOs using the chauffage concept sometimes focus only on supply-side efficiencies and refer to the contract as "chauffage." It may include some type of ownership of a part, or the totality, of HVAC systems by the ESCO. The contract typically provides for some means of making adjustments for energy prices on an annual basis.

Eligibility/Access Procedure

Not applicable.

Pros/Potential	Cons/Risks
• **Same benefit as subcontracting** activities but focusing on energy supply (generally supplying cooling or heating for processes). • Chauffage contracts are very useful where the customer wants to **outsource facility services and investment.** • Suitable for **contracting municipal services (**public administration).	• **Long contract duration**. • **Loss of control** over subcontracted **installations.** • Chauffage contracts are usually **very extensive and complex.** • **Large ESCO's gross margin** in order to cover all risks (financial, operational and technical).

Relevant Documentation	Utilization / Availability Data
• https://www.gov.uk/government/publications/energy-performance-contract-epc • https://ec.europa.eu/energy/intelligent/in-action/energy-performance-contracting/	

7. TAX INCENTIVES

Tax incentives appear to have been used more extensively in the past than recently. As part of fiscal policy, they are inevitable subject the annual reviews and tend to reflect transient budgetary deliberations. Nevertheless there are still many examples, as detailed in 7.1.

Italy has been offering tax incentives for EE improvements (the so-called '**legge-10',** detailed in 7.1.2) to existing buildings since 2007. The program provides tax credits to households and companies for single retrofit measures such as thermal insulation, installation of solar panels, and replacement of heating and air-conditioning systems, or for comprehensive retrofit work. Tax credit can cover 55% of the energy-related cost up to a maximum value. Tax credits are reimbursed over 10 years, beginning with the completion of work. The program boosted retrofit investment in the residential sector between 2007 and 2009 with 240,000 tax credits requests submitted in 2009 alone.

In the **Netherlands**, energy efficiency and renewable energy tax deductions have been available under the **Energy Investment Allowance (EIA,** 7.1.3**)** covering 41.5% of qualified technologies ranging between €3,000 to €162m.

In **Finland,** tax deductions for private citizens, or **Kotitalousvähennys** (7.1.1), are available when contracting solar panels and efficient heating systems installations to a company or to a private person. The deduction covers 45% of the construction costs (including VAT), 15% of the salary costs and the employers' contributions up to a maximum of €2400 per house inhabitant per year.

According to the **German 35a German Income Tax Act, EStG**, 20% in labour costs (up to €6000) can be deducted from tax liability for EE retrofits of existing residential buildings.

In **Greece**, finally, income tax credit (in combination with loan and grant) are offered to private customers for envelope's and generating systems' improvements incorporating renewable energy, up to €300 for energy efficiency expenditures of up to €3,000 (7.1.4).

Fiscal measures are an important class of support and can relate to a reduced rate of tax for the owners, properties and/or contracting organisations, as well as specific tax and VAT benefits on the various cost or profit elements. Eligibility criteria are usually transient, and quite specific in terms of type and final outcome of the interventions. To incorporate fiscal measures, in particular, requires a business model with the requisite detail for the developers and the development. This is an open question for the modelling specification, as tax details can become very intricate.

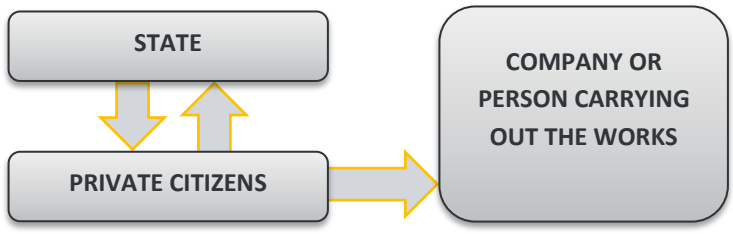
One benefit of fiscal measures is that they are capillary and don't have credit-worthiness-related access criteria, hence they can be utilized by individual private owners for small domestic energy retrofits.

7.1. CASE STUDIES ON TAX INCENTIVES

Instrument Name	**Country**	**ID**
State of Finland - Kotitalousvähennys *Household deduction*	**Finland**	**7.1.1**
Instrument Type	**Direct/Indirect**	
Tax deduction	**Indirect**	

Instrument Scope

Household deduction is a tax deduction for private citizens. The deduction can be granted when subcontracting the household domestic work, repair or maintenance work out to a company or hiring a person to do the work.

Stakeholders	**Scheme**
• **State –** granting the tax deduction • **Private Citizens –** Subcontracting the works. • **Company or person –** carrying out the works	

Description

Household deduction is a tax deduction for private citizens. The deduction can be granted when subcontracting the household domestic work, repair or maintenance work out to a company or hiring a person to do the work. The amount of deduction can be 45 % of the cost of work charge (including value added tax) when using a company, or when hiring a person, 15 % of the salary costs and employers' contributions.

Household deduction can be used for example for installation costs when having solar panels installed. Other heating systems renewals and renovation works are also eligible. When using household deduction, less taxes need to be paid.

The household deduction can be at most 2400 € per person. The deduction is personal, so a couple can get at most 4800 € deduction per year. An excess of 100 € per person needs to be paid first.

Eligibility/Access Procedure

The subjects that can apply to the scheme are private citizens' for having household domestic work and repair or maintenance work done by a company or a person

Pros/Potential	**Cons/Risks**

• Encourages domestic renovation projects	
Relevant Documentation	**Utilization / Availability Data**
• http://www.vero.fi/fi-FI/Henkiloasiakkaat/Kotitalousvahennys • http://www.motiva.fi/toimialueet/uusiutuva_energia/aurinkoenergia/aurinkosahko/jarjestelman_valinta/aurinkosahkotuotannon_taloudellinen_tukeminen • https://www.vero.fi/fi-FI/Syventavat_veroohjeet/Verohallinnon_ohjeet/2012/Kotitalousvahennys#10Vhennysasunnonkunnossapito-japerusparannustynperusteella_	

Instrument Name	Country	ID
Italy – Legge 10	**Italy**	**7.1.2**
Instrument Type	**Direct/Indirect**	
Tax deduction	**Indirect**	

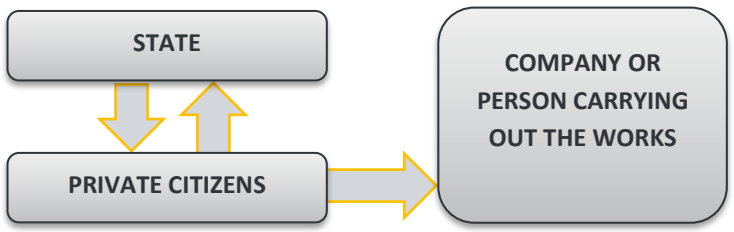
Instrument Scope

Comprehensive or single retrofit energy efficiency measures on households, such as thermal insulation, installation of solar panels, replacement of heating and air-conditioning systems or integrated refurbishments.

Stakeholders

- **State –** granting the tax deduction
- **Private Citizens –** Subcontracting the works and presenting receipts against their tax declarations.
- **Company or person –** carrying out the works

Scheme



Description

The 55% tax rebate programme provides tax credits to households for comprehensive or single retrofit energy efficiency measures, such as thermal insulation, installation of solar panels, replacement of heating and air-conditioning systems or comprehensive refurbishments. The total deductible amount is then distributed over a period of ten years.
Tax credit can cover 55% of the energy-related cost, but cannot exceed a maximum value that is determined by the type of measure taken. Tax credits are reimbursed over 10 years, beginning with the completion of work.

Legislative Decree 63, 4 June 2013, raised to 65% the tax deduction and extended to 31/12/2013 the incentives (30/06/2014 for renovations carried out on the common parts of residential buildings). Law n.147/2013 extended the 65% tax deduction to 31/12/2014 (30/06/2015 for renovations carried out on the common parts of residential buildings) and foresee a 50% tax deduction from 01/01/2015 to 31/12/2015 (30/06/2016 for renovations carried out on the common parts of residential buildings).

The tax rebate scheme has been confirmed for 2016 by the 2016 Stability Law. Three new possibilities have been introduced
1) to claim the incentive for home automation interventions, in particular relative to “multimedia devices for the remote control of heating, hot water and air conditioning”;
2) to transfer the incentive for interventions on building common parts on the supplier of the service in exchange for a discount;
3) to include social housing as new eligible area.

Eligibility/Access Procedure

The subjects that can apply to the scheme are private citizens' having household domestic work and repair or maintenance work done by a company or a person.

Pros/Potential	Cons/Risks
• Encourages domestic renovation projects • Allows capillary utilization/diffusion • Specific for households i.e. small private subjects (majority of buildings)	• Complex procedure of tax deductions • Often unknown or not clearly explained to homeowners

Relevant Documentation	Utilization / Availability Data
• http://www.vero.fi/fi-FI/Henkiloasiakkaat/Kotitalousvahennys • http://www.efficienzaenergetica.enea.it/Cittadino/involucro • http://www.iea.org/policiesandmeasures/pams/italy/name-44903-en.php?s=dHlwZT1lZSZzdGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlYWRjcnVtYiI-PGEgaHJlZj0iLyI-SG9tZTwvYT48c3Bhbj4gJmd0OyA8L3NwYW4-PGEgaHJlZj0iL3BvbGljaWVzYW5kbWVhc3VyZXMvIj5Qb2xpY2llcyBhbmQgTWVhc3VyZXM8L2E-PHNwYW4-ICZndDsgPC9zcGFuPjxhIGhyZWY9Ii9wb2xpY2llc2FuZG1lYXN1cmVzL2VuZXJneWVmZmljaWVuY3kvIj5FbmVyZ3kgRWZmaWNpZW5jeTwvYT48c3BhbiBjbGFzcz0ibGFzdCI-PC9zcGFuPjwvbmF2Pg,	

Instrument Name	Country	ID
Netherlands – Energy Investment Allowance (EIA)	**Netherlands**	**7.1.3**
Instrument Type	**Direct/Indirect**	
Tax deduction	**Indirect**	

Instrument Scope

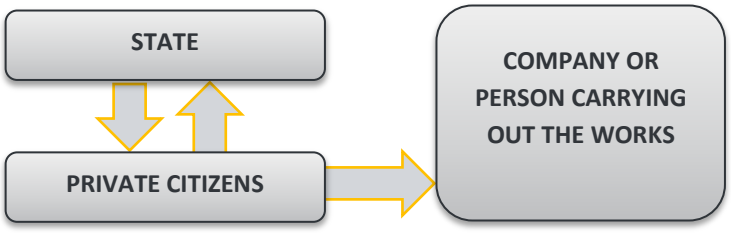
Energy savings and renewable energy installations in company premises.

Installations included are contained within the so called 'Energy List', which shows the interventions that qualify for the EIA. The list is updated annually by the Ministry of Economic Affairs, the Ministry of Housing, Physical Planning & Environment and the Ministry of Finance. Listing criteria include the following:

- Clear, unambiguous definition of the appliance or technology
- Substantial contribution to energy conservation or the use of renewable energy
- Reasonable cost-effectiveness
- Requirement of the EIA to support the market for the specific intervention
- Intervention must be applicable to a wide range of situations or businesses.

Examples of interventions in the energy list are:

- installation of heat pumps
- construction of cogeneration plants
- installation of Energy-efficient lighting systems
- envelope retrofit with effective insulation systems.

Stakeholders	Scheme
• **State –** granting the tax deduction • **Private Citizens –** Subcontracting the works. • **Company or person –** carrying out the works	

Description

The Energy Investment Allowance (EIA) is a tax-relief program. Companies that invest in energy-saving installations, or that make use of sustainable energy, may deduct a certain percentage of the invested sum from their taxable profits from the year in which the goods are purchased.

58 % of the relevant expenditures is deductible from the taxable earnings in the year in which the equipment is purchased.

The minimum amount that can be claimed of energy-saving investment is EUR 2,500 a year. This amount can consist of several individual investments, with individual investment of a minimum 450€. No investment allowance is granted for investments exceeding 120m € in a tax year (figures 2016).

The EIA is subject to a maximum annual budget, to be determined annually (€119 million in 2015).

The energy advice connected with the purchase can be included in the deduction, as well as additional costs needed to make an asset operational. Furthermore any investment grant received for the relevant asset must be deducted from the acquisition or production costs, exclusion made for operation subsidies.

Non-deductible costs are:

1) costs of assets already used by another party,
2) costs of assets such as: land, residential properties, passenger cars that are not intended for commercial road transport, vessels used for marketing purposes, securities, receivables, goodwill, permits and any other public law consents.

Eligibility/Access Procedure

The entitled parties are enterprises that invest in renewable energy systems, energy-saving projects or technologies improving energy efficiency (Article 3.42 in conjunction with Article 3.43 Wet IB 2001). Private individuals are not entitled to tax benefits.

Other eligibility conditions is the possess of an environmental permit or a building permit for the intervention.

Finally, a granted EIA will be revoked partially or in full (added back to the fiscal profit) on alienation of the assets within a five-year period and/or if the asset object of investment has been use prior to the installation.

As confirmed by the Netherlands Enterprise Agency, tax credits are awarded according to the following procedure:

- Application through web portal of Rijksdienst voor Ondernemend NederlandAgentschap, within three months from equipment purchase/installation. Companies have to apply for a tax reduction to the Netherlands Enterprise Agency (Rijksdienst voor Ondernemend NederlandA).
- Evaluation and award. The Netherlands Enterprise Agency evaluates the application and – if necessary – makes inquiries to the applicant, the energy agency approves the application
- Final decision. The tax authority has the last say, i.e. it may decide to authorise the tax credit awarded by the energy agency in full or only in part.

Pros/Potential	Cons/Risks
• Encourages domestic renovation projects • Medium Impact on energy savings and Co2 savings • Requires minimal reporting	

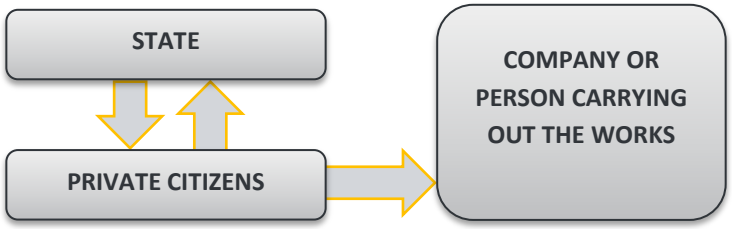
Relevant Documentation	Utilization / Availability Data
• http://www.res-legal.eu/search-by-country/netherlands/single/s/res-t/t/promotion/aid/tax-regulation-mechanism-energy-investment-allowance-eia-scheme-1/lastp/171/ • http://tax-consultants-international.com/read/eia?submenu=3644&sublist=3626 • https://www.pwc.nl/nl/assets/documents/pwc-investeringsfaciliteiten-2014-eng.pdf • http://www.agentschapnl.nl/content/brochure-energie-en-bedrijven-energielijst-2012 • http://www.agentschapnl.nl/organisatie/eloket • http://iepd.iipnetwork.org/policy/energy-investment-allowance-eia • https://home.kpmg.com/xx/en/home/insights/2013/10/netherlands-taxes-and-incentives.html	• 161m € budget in 2016 • 1.5b€ in total related investments, corresponding to yearly increase of 45% (2011 data)

Instrument Name	Country	ID
Greece – Tax deductions	**Greece**	**7.1.4**
Instrument Type	**Direct/Indirect**	
Tax deduction	**Indirect**	

Instrument Scope

The following interventions are covered:

- substitution of burner/boiler system and old HVAC systems with gas powered system (central or individual), a RE-powered system or a combined heat and power or a district heating system
- EE interventions in the existing distribution network system
- Thermal solar systems for hot water use or for air conditioning
- RE installations and cogeneration
- thermal insulation and efficient glazing on the building envelope
- automatic control devices for the heating system
- additional work required to complete implementation of the intervention
- energy audit by a qualified energy inspector.

Stakeholders	Scheme
• **State –** granting the tax deduction • **Private Citizens –** Subcontracting the works. • **Company or person –** carrying out the works	

Description

The purpose of the measure is to introduce tax incentives to promote energy efficient technologies /interventions.
The new legislation also introduces a reduction in income tax at a specific percentage of the costs for energy upgrading interventions of buildings which are performed after an energy inspection, up to 15,000 €.

Moreover, Law 4067/2012 provides incentives to increase the plot ratio to 10% in the case where the building has a particularly high energy efficiency ratio or environmental performance.
Law 4178/2013 allow the amounts paid for services rendered, work and materials on the energy upgrade and the structural adequacy of buildings erected before 2003 to be offset against building fines, up to 50% of the fine.

Eligibility/Access Procedure	
The subjects that can apply to the scheme are private citizens' for having household domestic work and repair or maintenance work done by a company or a person	
Pros/Potential	**Cons/Risks**
• Encourages domestic renovation projects	• Unclear level of control and enforcement
Relevant Documentation	**Utilization / Availability Data**
• http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-greece.pdf • https://library.e.abb.com/public/7eabc65a35114bcac12578c300486e2d/Greece.pdf	

8. INCENTIVES THROUGH UTILITIES AND COMMUNITY PROJECTS

Energy efficiency improvements, if extensively applied, translate into lower network loads For Distribution Network Operators (DNOs). Furthermore, in order to comply with EU 2020 strategy and with NEEAPs, most EU countries have imposed annual quotas of renewable energy utilisation and energy savings to be achieved via the energy retailers. In many energy markets, such as **Spain**, both energy savings and the production of renewable energy become marketable commodities through trading schemes, as detailed in 8.1.3.

We distinguish:

- Green Certificates: certificates, issued by a national administrator to public/private energy producers, proving that a specific amount of electricity (typically 1 MWh) is generated using RES. Green certificates can be only traded on a national basis.

- White certificates (aka Energy Savings Certificates, ESCs or Energy Efficiency Credits, EECs or white tags): tradable documents, issued by a national administrator to public/private energy producers, certifying an attained reduction in energy consumption.

In theory, the tradability guarantees that overall energy savings are achieved at least cost by converting the support into a market economy, with the required quota of certificates guaranteeing that the overall energy saving target is achieved.

It is therefore in the interest of retailers or DNOs to either:

1. purchase the certificates from RE generators (e.g. from owners of rooftop PV plants in large commercial/public buildings) or from ESCO-type companies usually contracted for EE retrofits
2. generate certificates by supporting RE projects for public entities or local communities, the DNO sponsored models
3. generate energy savings through customer reward mechanisms promoting a more balanced utilisation of energy during the day, hence a more predictable and efficient demand curve: these agreed or imposed changes in the power consumption of electric utility customers to better match supply and demand are called Demand Response Mechanisms (DRMs).

With respect the retrofit of individual buildings and small neighbourhoods including RES introduction, these benefits to public buildings or social housing structures can be incentivised by DNOs or by other bodies (for example ethical banks or NGOs), whereas DRMs can be applied by DNOs or retailers to any public/private customer wanting to reduce its energy bills, with the aid of a smart meter. Examples of DNO incentives and community projects are further outlined in APPENDIX 8.

Another popular DNO business model has been that of the **utility-sponsored community solar (**8.1.1 and 8.1.2**),** since utilities have the legal, financial and programme management infrastructure to handle

the implementation of a larger scale project on behalf of a consortia of private subjects. In this model, utility customers pay either an up-front or ongoing payment to support a solar project, receiving in exchange a credit on their bills proportional to their contribution and to the RE production. Participating customers usually retain no ownership stake in the solar system, but only the rights to the benefits of the energy produced by it. The same solution is used in **Finland** by some utilities. For example the energy company Helen, with its Kivikko solar plant, or the utility Vattenfall, with its Parc Syno solar plant. At consumer level, this model offers a twofold opportunity: for consumers to buy green energy without the space and investment requirements of building a domestic plant and for DNOs to produce Green Certificates.

As for White Certificates, their utilisation and trading is also connected with the level of market development for ESCO-type companies in the respective member states (3.1.4), on the relative clarity of the national policy and on its overlap with other incentives. In countries like Spain, for example, ESCOs are prolific whereas in Finland there are only 6 main ESCOs (Sinkkonen et al.,2013).

In the UK, other forms of utility related mechanisms are

- the Energy Company Obligation (ECO) – a domestic energy demand reduction programme, active since 2012. Under ECO, larger energy retailers fund the installation of energy efficiency measures in British households, such as loft or wall insulation, connection to district heating or replacement boiler to earn specific Obligation Certificates, a quota of these interventions being reserved to households inhabited by specific vulnerable social groups (OFGEM, 2015).
- the Green Deal (8.1.4) – launched by DECC in 2012, instituted loans for selected EE measures to be implemented in UK properties, with repayments through the energy bills and transfer with the property, all subject to an initial assessment. Repayments would have been theoretically outweighed by the energy savings. However, building owners were liable to repay the costs with failure to repay leading to disconnection of gas and electricity supplies. The scheme did not have sufficient success and after having been turned into a grant-based scheme in 2014, it was scrapped in 2015 for lack of demand.

As for Demand Response Mechanisms, most of the DR programmes in place in EU Member States have thus far focused on large industrial and commercial users and only recently have started to offer demand response management solutions for smaller commercial customers and households.

In **Spain**, the "**Interruptible service**" package offered since 2008 by Red Eléctrica de España (REE), offered the opportunity for large industrial customers to have their demand limited for periods of time of 45' to 12h, upon notice, in exchange for discounts in fixed and variable charges according to number of notices (available in 8.1.5).

In most countries, the main barrier for the institution of Demand Response Mechanisms is represented by the absence of smart-meters enabling a real-time informed dialogue between customers and utilities. In this respect, Finland and Italy are at the forefront of smart meters roll-ons: Finland reached 97% smart metering at the end of 2013 with hourly settlement down to domestic level. In comparison, by the same year the Spanish Endesa had replaced only 30% of meters (EU Parliament, 2015).

As a consequence, **Finnish** company Fortum has been one of the first EU utilities to launch a commercial DRM solution for its consumers in October 2012, called **Fortum Smart ("Fortum Fiksu",** 8.1.6**)**. The system automatically programs electrically heated boilers in households to use the cheapest hours on the electricity spot market (NordPool), offering heating costs savings in the range of 15% and further tailoring its accuracy to weather forecasts and to the load. The system also includes an interface that enables monitoring household's electricity consumption and price alerts via internet connection. Benefits of the system, once installation costs and service fee are factored-in, stand in the range of €300 - 500 for a typical one-family house, resulting in roughly 1 - 2 year investment payback times.

In **Italy**, ENEL has introduced smart-meters since 2001. As a consequence, 90%+ of households currently have two-way electronic smart meters (Reuters, 2013). ENEL invoices are currently based on actual consumption, with the possibility for users to access their bills online and a tariff divided into three times-of-use (named 'sera', 'weekend' and 'otto-sette'). In 2012, ENEL launched the **Smart-Info and Smart-Info+** initiatives, rolling out plug-and-play smart devices automatically connecting with the meter, providing real-time web-based and by-device consumption and generation info and enabling the setup of customized consumption limits (8.1.7).

Finally, in contrast, the case of **Hungary** demonstrates resistance to market based solutions with concerns about a lack of benchmarking for efficiency gains and lack of experience of DNO involvement in EE/RES installations.

As for community projects (8.1.8 and 8.1.9), these imply the active participation of the buildings/neighbourhood's occupants, as well as the involvement of a wider series of stakeholders (construction companies, municipal authorities and citizens' associations, to name a few). A further barrier is the often complex ownership structure characterizing the housing complex or the area subject to the refurbishment. In this context, the public sector plays often a key role as it is able to act as a community/funding aggregator, providing scale and coordination to an otherwise fragmented series of micro-interventions.

Community projects are currently underutilized as a category of interventions, the lack of public initiative being attributable to the inexperience at both the institutional and the supply chain level. However, where they are employed, they more often than not prove successful, especially in terms on their direct local profitability/costs-reduction effects.

An example is the UK Low Carbon West Oxford and West Oxford Community Renewables (8.9), a registered charity which established WOCORE an Industrial and Provident Society to invest in community renewables, including solar photovoltaics (PV),micro-hydro and small wind turbines.

The LCWO/WOCORE model has empowered the community to develop its own micro-renewable energy projects, and reinvests any profits in further carbon reduction projects in the community, empowering it by strengthening its social capital and networks. The sale of electricity was fully backed by Feed in Tariffs, which represent of course a key risk-reducing condition for the development of such articulated schemes and may identify importance of clear financial model as a basis for initial community engagement. Furthermore, aside the already favourable off-take conditions, the scheme has also relied

on grant funding from the Low Carbon Communities Challenge and prize money from Big Green Challenge. Funds raised from the share issue are still small as a percentage of the total funding (approximately 3%). This could mean that the public sector is required to subsidise these sorts of schemes to enable their establishment.

Community initiatives can take also the form of collective purchasing. Co-operatives may emerge to manage these, if they are not municipal initiatives. Some governments have community initiatives (UK Government, 2013) to encourage collective solutions to energy innovation, whilst, in Denmark, 20% of any wind turbine over a certain size has to be offered for sale to the local community (House of Commons, 2013). In contrast, discussion of centrally planned solutions emerges most strongly in the smart cities theme, most of which is much broader in scope that energy efficient retrofitting (EU Commission, 2015).

With respect to the modelling of district scale energy interactions, or community-led co-operatives, the topic is in its infancy, with the emergence of useful but highly stylised simulation models of potential interactions (Karnouscos, 2010). Clearly there is a vision of the smart building interacting in a dynamic and mutually efficient way, but how that dynamic co-ordination will emerge is still an open question. Some form of local dynamic optimisation in response to market signals would be needed to fully achieve district level benefits and this may be where new ESCO services become prominent. It appears that going forward, the most precise modelling of economic benefits will be based upon the aggregated effects of district level retrofitting design models, incorporating scale and interaction effects to the extent possible. Smart interactions may as yet be too speculative to fully parameterise as part of an economic district design model.

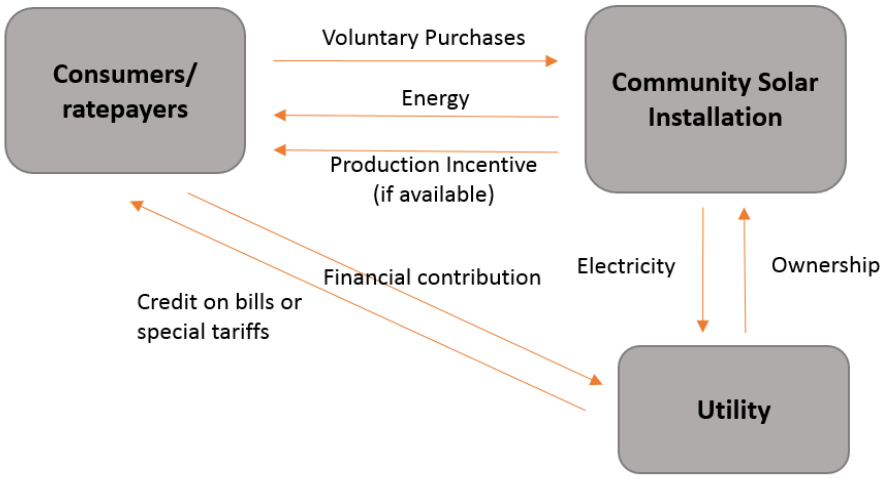
8.1. Case Studies on Utility Incentives and Community Projects

Instrument Name	Country	ID
Utility-Sponsored Model.	**Spain**	**8.1.1**
Instrument Type	**Direct/Indirect**	
Project financing model	**Indirect**	

Instrument Scope

For communities desiring to organize a community solar project, the local electric utility is a good place to start. Utilities are likely to have the legal, financial and program management infrastructure to handle organizing and implementing a community solar project.

At consumer level, this model brings the opportunity for consumers to buy green energy without assuming the upfront investment. At the same time, Utility-Sponsored Model are suitable for consumers who wants to consume PV energy but do not have place for PV panels.

Stakeholders	Scheme
• **Utility:** Entity which partially finances the project, install, operate and owns the plant. • **Consumer/Ratepayer**: utility clients who contribute to the project financing and enjoy credit on bills or special prices for their energy.	

Description

In most utility-sponsored projects, utility customers participate by contributing either an up-front or ongoing payment to support a solar project. In exchange, customers receive a payment or credit on their electric bills that is proportional to 1) their contribution and 2) how much electricity the solar project produces.

Usually, the utility or some identified third party owns the solar system itself. The participating customer has no ownership stake in the solar system. Rather, the customer buys rights to the benefits of the energy produced by the system.

Utility-sponsored programs can help make solar power more accessible by decreasing the amount of the purchase required, and by enabling customers to purchase solar electricity in monthly increments.

This model is widely used in EU, however it is being used in Europe as well.

The Utility invests in a solar plant through the consumer contribution and other funds (loans, equities or green bonds) and install, operate and own the facilities. The utility always owns the plant.

ENROLLMENT OPTIONS
• Single payment up-front
• Payment spread out on Instalment Plan
• Monthly subscription (no up-front fee).

Eligibility/Access Procedure

Not applicable.

Pros/Potential	**Cons/Risks**
• From a participant perspective, the tax implications are minimal. **Bill credits** for the value of electricity **are not generally taxed**. • **Green energy available for consumers** which cannot invest in PV panel or do not have space for its installation. • Access to credit bills and **special tariffs for consumers.**	• In designing mechanisms for customer participation in solar projects, utilities must be careful to comply with **securities regulations**. This requires carefully considering what benefit a customer-participant receives in exchange for a financial contribution to the project.

Relevant Documentation	**Utilization / Availability Data**
• **http://www.nrel.gov/docs/fy11osti/49930.pdf**	

Instrument Name	Country	ID
Special Purpose Entity (SPE) Model	**Spain**	**8.1.2**
Instrument Type	**Direct/Indirect**	
Project financing model	**Direct**	

Instrument Scope

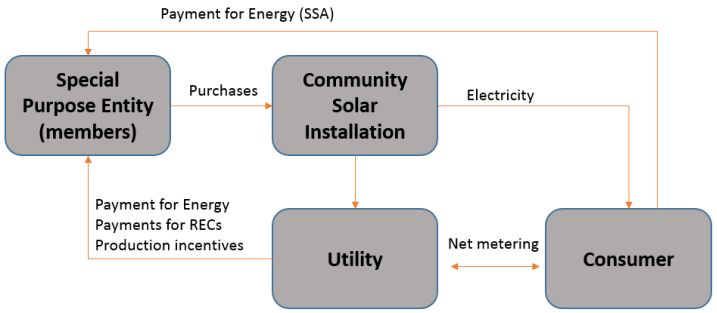
To take advantage of the tax incentives available to commercial solar projects, users/investors may choose to structure a project as a business. The main challenges in adapting these commercial solar structures for community projects include:

- Fully utilizing available tax benefits for community investors.
- Maintaining the community project identity when engaging non-community-based tax-motivated investors.
- Working within limits on the number of unaccredited investors if the project is to be exempt under securities laws.

Stakeholders

- **Utility:** Entity which pays the SPE for the produced energy.
- **Special Purpose Entity (SPE):** group of users and/or investors which finances and own the plant.
- **Consumer:** utility client.

Scheme



Description

Developing a community solar project as a special purpose entity means to take the significant complexity of forming and running a business. The user group must navigate the legal and financial hurdles of setting up a business and raising capital, while possibly having to comply with securities regulation. In addition, they must negotiate contracts between the participant/owners, the site host and the utility; set up the legal and financial processes for sharing benefits; and manage the operation of the business.

Given the complexity of forming a business, it is not surprising that many special purpose entities pursuing community solar are organized by another existing business entity with legal and financial savvy.

There is a range of business entities that could be suitable for a participant-owned community solar project; general partnerships, limited partnerships, Limited liability companies, Cooperatives, For-profit corporations, and Non-profit entities).

Entity Type	Liability for owners	Taxation	Advantages	Disadvantages
General Partnerships	Personal liability	Pass-through	Ease of formation; pass-through taxation	Personal liability of partners
Limited partnerships	Personal liability for general partners; limited liability for limited partners	Pass-through	Pass-through taxation, limited liability for limited partners	No liability shield for general partners
Limited Liability Companies	Limited liability	Usually pass-through	Pass-through taxation	Relatively new structure; may be harder to get financing
Cooperatives	Limited liability	Separate tax entity	Cooperative principles	Inflexible structure
Non-profit Entities	Limited liability	Separate tax entity	Tax deductions for donors	Business purposes are limited

Special purpose entities need to plan their financing structure carefully. For a community SPE, potential financing structures that maximize tax incentives are as follows:

- **Self-financing**: The simplest option for a community SPE is to finance the project with equity invested by community members.

- **Flip Structure**: In this scenario, the community SPE would partner with a tax-motivated investor in a new special purpose entity that would own and operate the project. Initially, most of the equity would come from the tax investor and most of the benefit would flow to the tax investor (as much as 99%). When the tax investor has fully monetized the tax benefits and achieved an agreed upon rate of return, the allocation of benefits and majority ownership (95%) would "flip" to the community SPE (but not within the first five years). After the flip, the community SPE would have the option to buy out all or most of the tax investor's interest in the project at the fair market value of the tax investor's remaining interest.

Sale/Leaseback: In this scenario, the community SPE (as the developer of the project, the site host, or both) would install the PV system, sell it to a tax investor and then lease it back. As the lessee, the community SPE would be responsible for operating and maintaining the solar system as well as have the right to sell or use the power. In exchange for use of the solar system, the community lessee would make lease payments to the tax investor (the lessor). The tax investor would have rights to federal tax benefits generated by the project and the lease payments. The community SPE might have the option to buy back the project at 100% fair market value after the tax benefits are exhausted.

Eligibility/Access Procedure

Not applicable.

Pros/Potential	Cons/Risks
• **Tax benefits.** • **Limited liability** in some cases. • **Tax through taxation**	• **Regulations** are a major burden in financing structures for the SPE model. • Special purpose entities need to plan their financing structure carefully, which means **complexity**.

Relevant Documentation	Utilization / Availability Data
• http://www.nrel.gov/docs/fy11osti/49930.pdf	

Instrument Name	Country	ID
Green/White Certificates	**Spain**	**8.1.3**
Instrument Type	**Direct/Indirect**	
Utility Related Mechanism	**Indirect**	

Instrument Scope

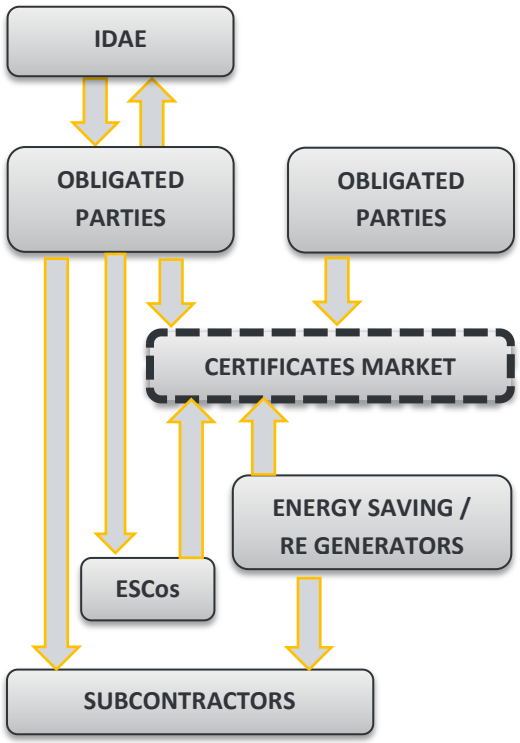
- Industrial processes: heat generation or recovery for cooling/drying, generation of electricity from recovery/RES/cogeneration
- Residential, agricultural and services sectors: HVAC systems, water heating, consumer electronics
- Street lighting

Stakeholders

- **IDAE ((Institute for Diversification and Saving of Energy):** managing the mechanism
- **Obligated parties**: obligated parties are the suppliers of electricity and natural gas, and wholesale retailers of oil products and LPG (utilities). They are obligated to declare their GWh sales (white certificates) and the quota of their energy produced with RES (green certificates) and to pay an amount related to the savings obtained from previous year (white certificates) or to the amount of energy not produced through RES (green certificates).
- **Eligible Implementers (subcontractors/ESCos) –** carrying out the efficiency retrofit/installing RE plants. In the case of ESCos, these could be allowed to register for submitting projects to get energy savings certificates. Obligated parties could then transfer to ESCos their saving obligations.

  Energy savings generators – public/private subjects implementing the energy savings (white certificates) or generating RE (green certificates) and selling the certificates.

Scheme



Description
White Certificates - The energy efficiency obligation scheme has started in July 2014. In a first phase, the obligations will be achieved only through payments to a new National Energy Efficiency Fund. In a second phase, the scheme may include tradable energy savings certificates (but this will likely depend on political decisions to be taken after the general elections at the end of 2015). The overall energy savings target for 2014-2020 amounts to 6 356 ktoe over 2014-2020. Targets for the two first years: 131 ktoe (1 523 GWh, 0.17% rate) for 2014, 262 ktoe (3 046.51 GWh, 0.395% rate) for 2015. The obligated parties have to report each year about their energy sales (in GWh) to all their final customers (all sectors except agriculture and fishery) the previous year (about 771 TWh in 2013), and then to pay in the year "n" in proportion to their energy sales in the year "n-2". The contribution fee has been set to about 68€/MWh in 2014 and 2015. The obligations and contribution fee are set annually, taking into account the overall target for 2014-2020 and the estimated average costs for energy savings from the activities of the Fund. A catalogue of standardised actions (with deemed savings) is under preparation by the IDAE, to be used in the possible second phase. The catalogue aims at covering all end-use sectors. In a second phase, an energy savings trading scheme could be put in place (the option of contributing to the fund would likely still be allowed). IDAE has been in charge of preparing this option. Detailed guidelines would have to be specified. The implementing text (Decreto-ley 8/2014) has defined detailed rules about infringements, sanctions/penalties and related procedures. They cover the possible situations of frauds, noncompliance and non-achievements. **Green Certificates -** Some Spanish energy suppliers disclose their renewable energy mix via RECS International, but there is currently no formal REC (Renewable Energy Certificate) or GO (Guarantee of Origin) market in the country. Spain's government promotes electricity from renewable sources primarily through price regulation: • System operators may choose between a feed-in tariff and a bonus, which is paid on top of the electricity price achieved in the wholesale market. Furthermore, investments in systems and equipment required for the generation of electricity from RE are tax deductible. • At the end of every month, the grid operator must prove that its additional income and additional expenses (for the payment of tariffs to the system operators) balance out. If the operator's balance is negative, the deficit is covered by the National Energy Committee (CNE). • Spanish energy suppliers generally do not offer green pricing programs; executives with operations in Spain most often procure RECs from outside sources, e.g. RECS International.
Eligibility/Access Procedure
Obligated parties (utilities) are automatically included into the scheme.

Pros/Potential	Cons/Risks
• Certification guarantees meeting the agreed targets • Tradability aims at least cost achievement of targets. • The systems unlocks RE/EE potentials and actors that are currently dormant whilst reducing pressures on public budgets • Can stimulate the market for ESCOs (white certificates) • Involves utilities by making them accountable (green certificates)	• Possible free rider effect, if targets are not challenging enough • Requires complex administrative structures to be controlled and enforced (transaction costs), with risks of double counting • The measure targets only efficiency increases and RE production, not overall reduction of energy consumption • Regulatory uncertainty: permanence of certification schemes • Tradability and pricing depend on market liquidity (which depends on international adoption) • Problems to follow dynamic evolution in energy use and prove additionality effect • Total costs are not known ex-ante which can lead to oversized compensation to obliged parties

Relevant Documentation	Utilization / Availability Data
• http://atee.fr/sites/default/files/1-snapshot_of_energy_efficiency_obligations_schemes_in_europe_27-5-2015.pdf • http://sustainround.com/library/sites/default/files/SRER_Member%20Briefing_International%20Markets%20for%20Renewable%20Energy%20Certificates_2012-07-16.pdf • http://energia.fi/sites/default/files/whitecertificatesystemsapplicabilitytofinland_report_final.pdf • http://www.slideshare.net/Alejo66/sales-of-spanish-green-certificates-in-the-eu	**White Certificates - total contribution to the Fund of 103m € in 2014 and 207m € in 2015.**

Instrument Name	Country	ID
Green Deal	**UK**	**8.1.4**
Instrument Type	**Direct/Indirect**	
Utility Related Mechanism	**Indirect**	

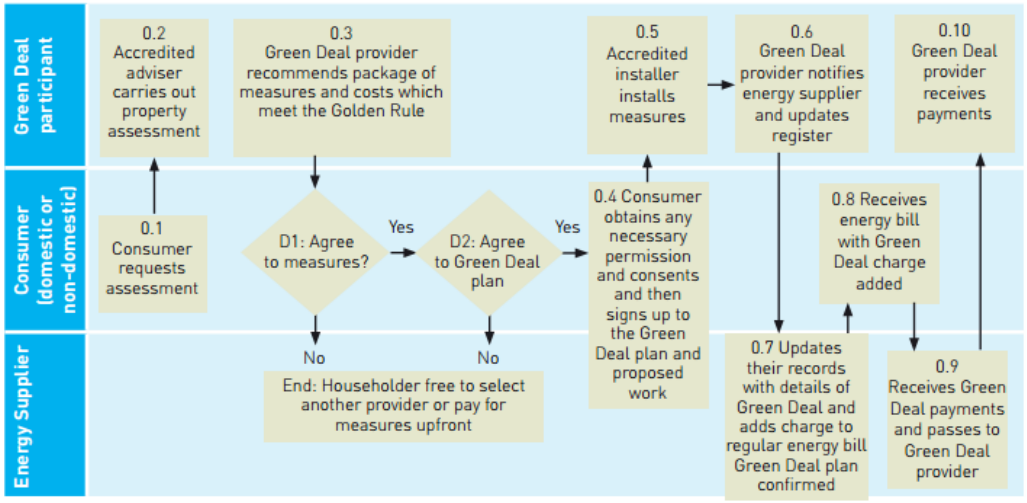
Instrument Scope

The Green Deal Home Improvement Fund (GDHIF) was an incentive scheme open to all householders in England and Wales wanting to improve the energy efficiency of their homes.

The scheme allowed householders to choose one or both of the two core offers available and may also be eligible to claim up to £7,600 as a bundled package. The policy closed to new applications on 24 July 2014

Eligible interventions included:

- Energy efficient HVAC, water heating and lighting
- Energy efficient glazing and Doors
- Building envelope and HVAC Insulation
- Building and building equipment Controls
- Shading devices and transpired solar collectors
- Variable speed drives for fans and pumps
  Residential RES and heat pumps

Stakeholders	Scheme
• **Consumer** • **Accredited Adviser** • **Green Deal Provider** • **Green Deal Installer** • **Utilities (energy suppliers)** • **GEMSERV (Green Deal Administrator)**	

Description
Property Assessments could be requested by consumer to a Green Deal Assessor Organisation (GDAO). The Green Deal Advisor provided a report on advised energy improvement measures. The funding for these measures was then issued by the green deal finance company (GDFC); following which the Green Deal Provider and a Green Deal Installer installed the measures. DECC proposed tying low interest loans of estimated 7%, issued by Green Deal Providers for energy efficiency improvements to the energy bills of the properties the upgrades are performed on. These debts would then be passed onto new occupiers when they take over the payment of the bills following a "Golden Rule": the cost of repayments never outweighs the savings on the bill. Gemserv was the scheme administrators for the Green Deal Oversight and Registration Body (GD ORB. The GD ORB managed scheme administrative functions, such as maintaining the public registers of authorised participants and participant helpdesk; as well as working alongside industry and government to further develop and share best practice in operational processes, and raising awareness about consumer protection issues. The associated Green Deal Home Improvement Fund (GDHIF), is a new energy efficiency incentive available to households in England and Wales for taking measures to improve the energy efficiency in their homes. The households would be eligible to claim up to £7,600 for improving their homes divided into 4 core offers: Core Offer 1 - up to £1,000 for installing 2 energy saving improvements among a listt of selected ones Core Offer 2 - up to 75% of total installation costs for internal/external wall insulation, up to £6,000 Core Offer 3 - up to £100 refund for a Green Deal Assessment Report (GDAR) less than 24 months old Core Offer 4 - additional bonus up to £500 if house bought in the last 12 months prior to application
Eligibility/Access Procedure
To be eligible for the GDHIF scheme offers householders must satisfy the following incentive criteria: • Customers must apply for the voucher before the work starts • Measures contained in Energy Performance Certificate (EPC) or GDAR dating back less than 24 months • Customers must not be receiving other funding for the same intervention

Pros/Potential	Cons/Risks
• repayment embedded in the energy bills • capillary diffusion, suitable for individual consumers, residential EE retrofit. • quality of the interventions guaranteed through a system of certified operators (assessors, providers, installers)	• lack of stimulus to drive demand for the uptake of the Green Deal and limited projected coverage to consumer protection (especially tenants or homebuyers 'inheriting' the Green Deal) • uncertainties over the treatment of non-domestic buildings, no Green Deal for Businesses. • uncertainties over effective implementation of the "Golden Rule" due to the scheme articulation and the high interest rates • oligopoly risk as Gemserv owned by the 6 largest energy companies in the UK • various concerns related to effectiveness and alignment with general energy strategy and carbon emission goals • not benefitting occupants (8% of bill savings against 92% going to investors)

Relevant Documentation	Utilization / Availability Data
• http://www.nrel.gov/docs/fy11osti/49930.pdf • https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47978/1010-green-deal-summary-proposals.pdf • https://en.wikipedia.org/wiki/The_Green_Deal	

Instrument Name	Country	ID
Interruptible Service	**Spain**	**8.1.5**
Instrument Type	**Direct/Indirect**	
Demand Response Mechanism	**Indirect**	

Instrument Scope

Large commercial and industrial buildings.

Stakeholders	Scheme
• **Utility:** entity applying the charges. • **Customers**: commercial clients agreeing to the contract and receiving the discount on charges normally paid.	

Description

Red Eléctrica de España (REE), since 2008, offers the opportunity to have customers demand limited for periods of time of 45' to 12h, upon notice, in exchange for discounts in fixed and variable charges according to number of notices.

Eligibility/Access Procedure

n/a

Pros/Potential	Cons/Risks
• **Reduced cost of consumption for the customer and of generation for the utility** • **Capillary diffusion, suitable for individual commercial customers**	• **Potential disruption to production processes and commercial activities** • **Sustainability of the advantage for the customers over the long term, potential lock-in effect**

Relevant Documentation	Utilization / Availability Data
• http://www.nrel.gov/docs/fy11osti/49930.pdf	

Instrument Name	Country	ID
Fortum Fikso	**Finland**	**8.1.6**
Instrument Type	**Direct/Indirect**	
Demand Response Mechanism	**Indirect**	

Instrument Scope

Roll-on of programming system for electrically heated residential boilers., optimizing their consumption. The financing mechanism is indirect in the sense that it produces finance in the form of energy savings, for the customer and for the generator due to the increased consumption efficiency. The relationship between the utility and the consumer remains direct.

Stakeholders	Scheme
• **Utility:** Entity which rolls-out the program. • **Consumer/Ratepayer**: utility clients , consumers.	

Description

The system automatically programs electrically heated boilers in households to use the cheapest hours on the electricity spot market (NordPool), offering heating costs savings in the range of 15% and further tailoring its accuracy to weather forecasts and to the load. The system also includes an interface that enables monitoring household's electricity consumption and price alerts via internet connection. Benefits of the system, once installation costs and service fee are factored-in, stand in the range of €300 - 500 for a typical one-family house, resulting in roughly 1 - 2 year investment payback times.

Eligibility/Access Procedure

Utility customers.

Pros/Potential	Cons/Risks
• **Efficiency and reduced cost of consumption for the customer and of generation for the utility** • **Customer education leading to an overall behavioural change and a potential increased responsiveness to other EE initiatives** • **Capillary diffusion, suitable for individual homeowners and small commercial customers**	• **Malfunctioning of the meters,** • **Requires customer education, not immediate results** • **Sustainability of the advantage for the customers over the long term, potential lock-in effect**

Relevant Documentation	Utilization / Availability Data
• http://www.nrel.gov/docs/fy11osti/49930.pdf • http://www.fortum.com/countries/fi/energiansaasto-ja-ratkaisut/fiksu-kotiautomaatio/pages/default.aspx	

Instrument Name	Country	ID
ENEL Info / Info+	**Italy**	**8.1.7**
Instrument Type	**Direct/Indirect**	
Demand Response Mechanism	**Indirect**	

Instrument Scope

Rolling out of smart devices informing residential and small commercial users on their consumption in a detailed way and educating the demand. The financing mechanism is indirect in the sense that it produces finance in the form of energy savings, for the customer and for the generator due to the increased consumption efficiency. The relationship between the utility and the consumer remains direct.

Stakeholders	Scheme
• **Utility:** Entity which rolls-out the meters. • **Consumer/Ratepayer**: utility clients , consumers.	

Description

ENEL invoices are currently based on actual consumption, with the possibility for users to access their bills online and a tariff divided into 3 times-of-use. The Smart initiatives rolls out plug-and-play meter connected smart devices providing real-time web-based and (for Info+) by-device consumption/generation info and enabling the setup of personalized consumption limits.

Eligibility/Access Procedure

Available for utility customers in selected provinces of Italy.

Pros/Potential	Cons/Risks
• **Efficiency and reduced cost of consumption for the customer and of generation for the utility** • **Customer education leading to an overall behavioural change and a potential increased responsiveness to other EE initiatives** • **Capillary diffusion, suitable for individual homeowners and small commercial customers**	• **Malfunctioning of the meters,** • **Requires customer education, not immediate results** • **Sustainability of the advantage for the customers over the long term, potential lock-in effect**

Relevant Documentation	Utilization / Availability Data
• https://www.youtube.com/watch?v=bRHDuqKPwAc • http://e-distribuzione.it/it-IT/Pagine/enel_info_piu_sezione.aspx	

Instrument Name	Country	ID
Low Carbon West Oxford and West Oxford Community Renewables	**UK**	**8.1.8**
Instrument Type	**Direct/Indirect**	
Community Project	**Indirect**	

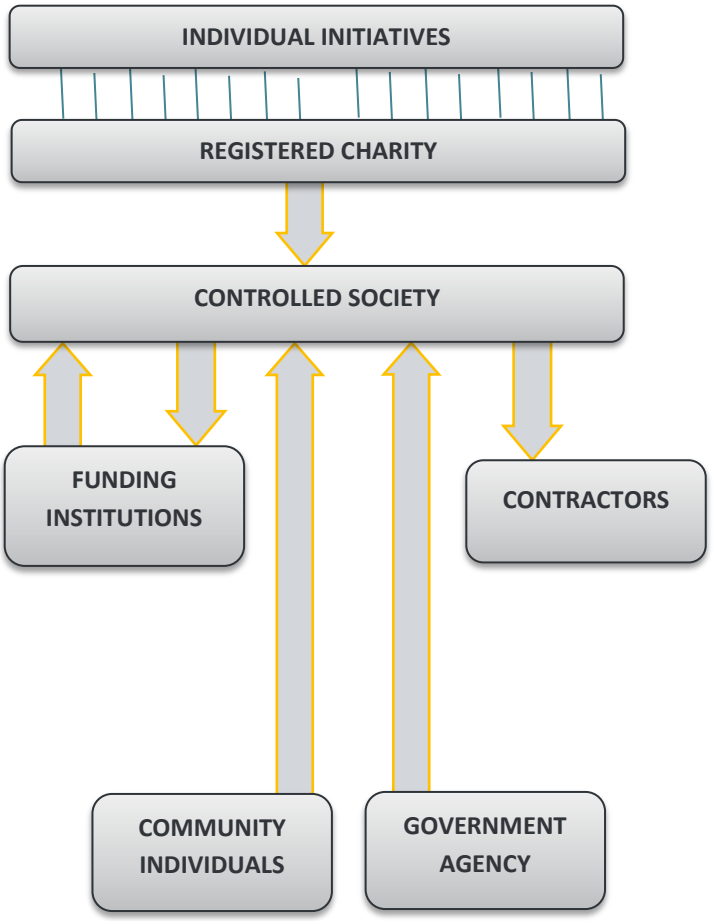
Instrument Scope

Renewable energy installations on (primarily) social housing and industrial and commercial estates, such as PV, micro-hydro and micro-wind, as well as further local energy efficiency initiatives to be financed with the RE installations' proceeds.

Stakeholders

- **Registered Charity (LCWO)** – pooling of RE initiatives, general administration, and coordination of the EE initiatives to be implemented with proceeds from the scheme.
- **Controlled Industrial and Providence Society (WOCORE) –** society dedicated to the renewable energy investment, provides legal structure to the initiative, implements RE projects and separates its activities and finances from the rest of the charity activities.
- **Community individuals:** local owners contributing to the scheme and purchasing the RE power generated.
- **Funding institutions –** public and private institutions providing funding in the form of, respectively, loans and grants, and helping with the funds administration
- **Government agency, OFGEM –** providing Feed in Tariffs for the excess production.
- **Contractors –** realizing and monitoring the construction/operation

Scheme



Description	
Low Carbon West Oxford (LCWO), a registered charity, established in 2007 WOCORE an Industrial and Provident Society, to invest in community renewables, including solar photovoltaics (PV), micro-hydro and small wind turbines, bringing together a number of local environmental initiatives. It sells power generated from micro-renewables including solar, wind and hydro, to the local community and excess power to the grid. It is intended to produce 400,000 kWh a year and aims at reducing carbon emission by 80% by 2050. It has invested in low carbon living and behavioural change projects, including in housing, introducing energy efficient streetcars and street vans, tree planting and beautification.	
Eligibility/Access Procedure	
Individual investors/owners as well as owner of social housing and industrial/commercial estates.	
Pros/Potential	**Cons/Risks**
• **Works as a revolving funds: proceeds are reutilised to further benefit the community** • **Promotes community cohesion, empowering** • **Extensively applicable on an international level**	• **Difficult to administer due to the higher articulation** • **Difficult to obtain engagement from local owners/smaller stakeholders** • **Needs financial intermediaries with strong administrative capabilities to partner with the society and help with the financial administration** • **Needs stronger control during construction/operation via an owner engineer / independent asset manager** • **Requires strong secure off-take plan or incentives to gain initial traction from the public.**
Relevant Documentation	**Utilization / Availability Data**
• https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207920/community_energy_call_for_evidence.pdf • http://www.lowcarbonwestoxford.org.uk/	

9. SECURITISATION

Securitization is the financial practice of pooling various types of contractual debt and selling their related cash flows to third party investors as securities, which may be described as bonds or collateralized debt obligations (**CDO**s). Investors are repaid from the principal and interest cash flows collected from the underlying debt and redistributed through the capital structure of the new financing. Securities backed by assets (e.g. a RE plant or the results of an EE retrofit) are called asset-backed securities (**ABS**). Relevant examples of securitization are also detailed in 9.1.

The most relevant securitization in Europe is the EU 2020 Project Bond initiative, established in 2012 with Regulation 670/2012 and managed by the EIB (9.1.1). In a nutshell, corporate bonds related to EU-EIB-financed projects, enhanced in credit quality by a risk sharing facility provided by the EIB, are offered to institutional investors in order to support capital market financing of projects.

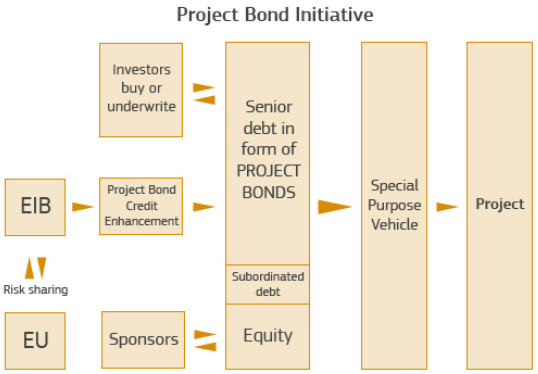


Figure 3 – Structure of the EU Project Bond Initiative. *(Source: EC website)*

Although EU 2020 project bonds have been so far used only for large RE infrastructural investments, a potential use of the same solution for EE retrofits of small neighbourhood/flagship public buildings or for community RES cannot be ruled out.

RES/EE securitization in Europe is currently dominated by Green Bonds, which took off in 2014 with $36.6bn issued, tripling the amount issued in 2013 ($11bn, according to Climate Bonds Initiative, 2015). Green bonds were issued to fund a pool of projects with positive environmental/climate benefits set-up by companies meeting eligibility criteria of governance and CSR policies. The majority of Green Bonds issued are green “use of proceeds” or asset-linked bonds. Proceeds from these bonds are earmarked for green projects but are backed by the issuer’s entire balance sheet. There have also been green "use of proceeds" revenue bonds, Green Project Bonds and Green Securitized Bonds.
Currently, the Green Bonds market is totalling up 118 b$ (OECD et al., 2016).

Type	Proceeds raised by bond sale are	Debt re-course	Example
Green "Use of Proceeds" Bond	Earmarked for green projects.	Standard/full re-course to the issuer; therefore same credit rating applies as to issuers other bonds.	EIB "Climate Awareness Bond" (backed by EIB)
Green "Use of Proceeds" Revenue Bond	Earmarked for green projects.	Revenue streams from the issuers though fees, taxes etc are the collateral for the debt.	Hawaii State (backed by fee on electricity bills of the state utilities)
Green Project Bond	Ring-fenced for the specific underlying green project(s).	Re-course is only to the project's assets and balance sheet.	Alta Wind Holdings LLC (backed by the Alta Wind project)
Green Securitized Bond	Either 1) earmarked for green project or 2) go directly into the underlying green projects.	Re-course is to a group of projects that have been grouped together (i.e. covered bond or other structures).	1) Northland Power (backed by solar farms) or 2) Solar City (backed by residential solar leases)

Standard bonds vs. green "use of proceeds" bonds

- Flat pricing of green bond to conventional bonds (i.e. no additional cost)
- Same recourse to issuer
- Pari passu applies
- Bonus feature of "green" – positive environmental outcomes

Figure 4 – Green Bond typologies. (*Source: EC website*)

The Finnish Munifin (9.2) will issue EUR 500m in 7-10 years project green bonds by the end of 2016. The bond will be used by Munifin to finance eligible Finnish green projects, including RE and EE interventions and with maturities between 5 and 41 years. Projects are selected after a three-level assessment including third-party opinion. In the future, MuniFin aims to issue one benchmark sized Green Bond per year, representing around 15% of its annual gross lending volume.

The first **Spanish** Green Bond issue, iHola España from Iberdrola (2014, EUR750m, 8.5 years, first issue in Spain, as detailed in 9.1.3) was four times oversubscribed. Proceeds were used for the company's renewable energy businesses, to refinance existing investments and to spur new renewable investments and smart grid solutions to improve demand management. Green bonds also enable investors to commit their funds to the renewable energy part of the businesses alone. iHola Espana had a coupon of 2.5% , and had Santander, Bank of America, Goldman Sachs, HSBC, JP Morgan and Lloyds Bank as joint "book runners".

Other examples of Green Bonds supporting EE retrofits of buildings have been issued in the past two years by the French Credit Agricole (CACIB Green Notes), the Swedish SBAB, NIB's 500m EUR environmental bond, the Dutch ABN-AMRO's 500m EUR to fund low carbon buildings, Rabobank's OBVION with the first 100% green RMBS (Residential Mortgage Backed Security), and the Italian Foresight's Green Bond Fund, issued in March 2016 and financed jointly with the EIB (Climate Bonds Initiative, 2014).

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Another popular example of securitisation, though mainly employed to finance large scale RE plants, is the **Yieldco.** This is a dividend growth-oriented public company, created by a parent company (e.g., SunEdison), that bundles RE/EE operating assets in order to generate predictable cash flows, periodically distributed to shareholders in the form of dividends. The capital raised can be used to pay off expensive debt or finance new projects at competitive rates.

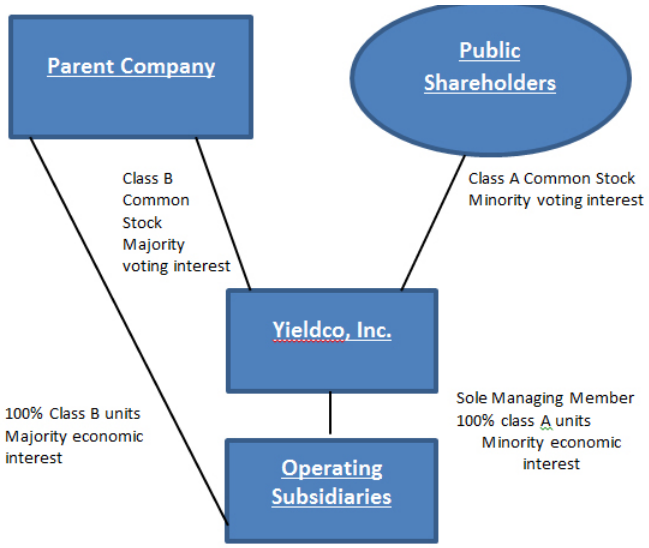


Figure n.05 – YeldCo structure *(Source: Yeldcom)*

In **Spain** both Sunedison and Abengoa have issued Yieldcos (9.4), respectively called TerraForm Power and Abengoa Yield. To be profitable, Yieldcos rely on the holding company capacity to quickly pool together a consistent project portfolio and to impeccably and rapidly execute it; additionally, as with Terraform, Yieldcos can have a structure in which investment proceeds are fed back into the holding company when a certain level of dividends is surpassed. But this can excessively focus the attention on the acquisition phase to the detriment of execution, creating an unsustainable level of debt and bringing the company to bankruptcy, as happened with Sunedison in 2015. Another risk for Yieldcos is contagion from bankruptcy of their holding companies. That was the case with Abengoa Yield, insulated by its parent company in Q1 2016 and swiftly rebranded to survive (Eckhouse, B., 25/11/2015). Other EU Yieldcos which have proven to have a longer life (and better performances) are the British Greencoat UK Wind PLC, and the German Capital Stage AG (Solarplaza Yieldcon, 2015).

9.1. CASE STUDIES ON SECURITISATION

Instrument Name	**Country**	**ID**
EU 2020 Project Bond Initiative	**EU**	**9.1.1**
Instrument Type	**Direct/Indirect**	
Security/Project Bond	**Direct**	

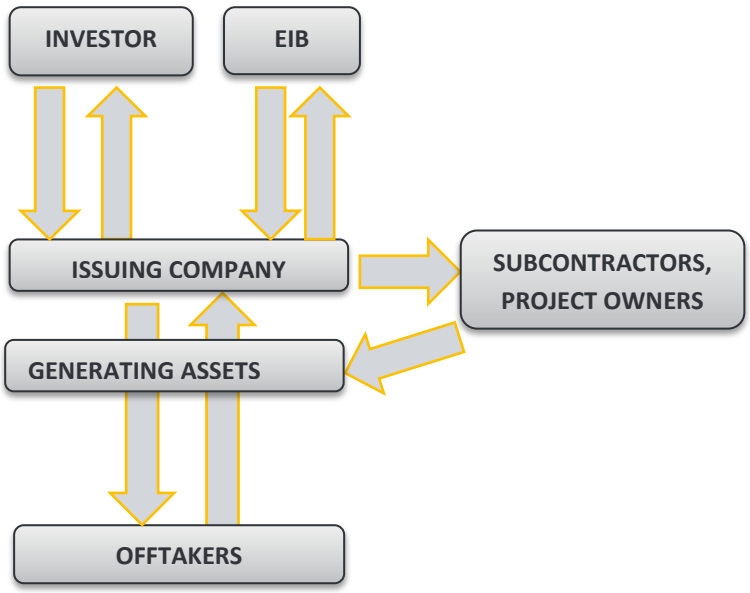
Instrument Scope

Commercially viable infrastructure projects in the EU, which are eligible for funding under the TEN-T or TEN-E policies or under the CIP-Decision on broadband, can benefit from the initiative.

Stakeholders

- **Investors –** buying the bonds, investing funds in the project portfolio, receiving dividends once portfolio starts generating revenues
- **EIB -** supporting the bond issue
- **Issuing company –** issuing the bonds, pooling together and managing the underlying portfolio of assets, repaying the bond and the debt with their underwriters
- **Subcontractors, project owners, off takers –** respectively constructing/selling the generating assets to the issuing company
- **Offtakers** - providing revenue to the issuing company in exchange for the power produced by the asset.
- **Credit rating agencies, regulators and auditors -** institutions responsible for verifying compliance with the standards for green bonds or established credit standards, regulators responsible for rules on capital markets.

Scheme



Description
The Project Bond initiative is a joint initiative by the European Commission and the EIB. The Project Bond initiative is designed to enable eligible infrastructure projects promoters, usually public private partnerships (PPP), to attract additional private finance from institutional investors such as insurance companies and pension funds. This will be achieved by providing credit enhancement to those promoters, whose debt will effectively be divided into two tranches: senior and subordinated. The subordinated debt, or Project Bond Credit Enhancement (PBCE) can take the form of a loan from the Bank, with the support of the European Commission and is given to the promoter at the outset. It may also take the form of a contingent credit line which can be drawn upon if the revenues generated by the project are not sufficient to ensure senior debt service. The PBCE underlies the senior debt and therefore improves its credit quality, offering peace of mind to institutional investors. The bonds themselves will be issued by the promoters not by the Bank or the Member State in question. The support will be available during the lifetime of the project, including the construction phase. In July 2012, the European Parliament and the ECOFIN Council approved the legislative proposal issued by the Commission in October 2011. The Cooperation Agreement between the EIB and the European Commission, defining the mechanism for risk and revenue sharing between the two institutions, was signed on November 6, 2012. Suitable projects will need to reach financial close between now and end of 2016, provided that the EIB obtains financing approval by its Board before the end of 2014. By the end of June 2013, the EIB Board of Directors has already approved nine TEN-T and TEN-E projects in six different Member States as being eligible under the Project Bond Initiative. The first financial closures of these projects are expected in the second half of 2013.
Eligibility/Access Procedure
General project eligibility will be determined according to the relevant TEN (TEN-T and TEN-E) and CIP policy guidelines as proposed by the Commission and approved by the co-legislators. The focus is thus on TEN-transport, TEN-energy and broadband projects. The specific projects will need to provide stable and strong cash flows in addition to being economically and technically feasible. The EIB will perform an evaluation of these factors in view of its experience with infrastructure financing. As with other financial instruments for attracting private investment, it will ultimately depend on investors which of the eligible projects would receive financing under this initiative. Projects that would not attract finance under this initiative could well be funded via other means.

Pros/Potential	**Cons/Risks**
•	•

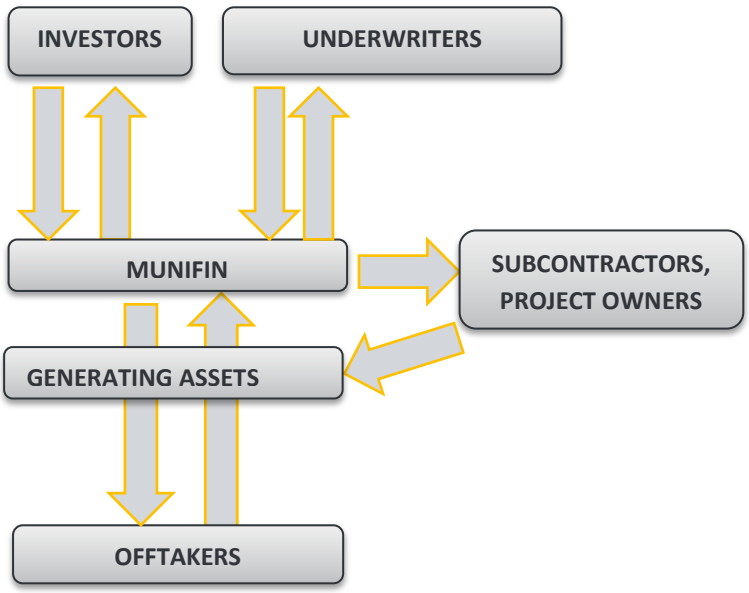
Relevant Documentation	**Utilization / Availability Data**
• http://ec.europa.eu/economy_finance/financial_operations/investment/europe_2020/index_en.htm • http://europa.eu/rapid/press-release_MEMO-12-370_en.htm?locale=en • http://ec.europa.eu/economy_finance/financial_operations/investment/europe_2020/index_en.htm	

Instrument Name	Country	ID
Munifin Green Bonds	**Finland**	**9.1.2**
Instrument Type	**Direct/Indirect**	
Security/Green Bond	**Direct**	

Instrument Scope

MuniFin's Green Framework divides projects into seven categories:

- Renewable energy
- Energy efficiency
- Sustainable public transportation
- Waste management
- Water and waste water management
- Sustainable buildings
- Environmental management incl. nature conservation

Stakeholders	Scheme
• **Investors –** buying the bonds, investing funds in the project portfolio, receiving dividends once portfolio starts generating revenues • **Underwriters and other financial intermediaries:** financial institutions structuring the bond and putting it to market, lending to the issuing company, all for a fee. provide credit guarantees and credit enhancement products in secondary markets, thus modifying the risk profile of the underlying bond. • **Munifin –** issuing the bonds, pooling together and managing the underlying portfolio of assets, repaying the bond and the debt with their underwriters • **Subcontractors, project owners, offtakers –** respectively constructing/selling the generating assets to the issuing company	

• **Offtakers -** providing revenue to the issuing company in exchange for the power produced by the asset. • **Credit rating agencies, regulators and auditors:** institutions responsible for verifying compliance with the standards for green bonds or established credit standards, regulators responsible for rules on capital markets.	

Description

Green financing is offered to selected projects that promote the transition to low-carbon and climate resilient growth. These projects seek to mitigate or adapt to climate change.

All green projects are financed and located in Finland. In addition to marketing benefits and improved profiling advantage for its customers, MuniFin offers a margin discount for all green projects. The amount of discount is based on the project categorisation provided by Cicero in its Second Opinion (dark/medium green). The greener the project, the bigger the discount.

Green financing projects are selected using MuniFin's Green Framework and finally approved by the Green Evaluation Team, which consists of two or more members from environmental functions of MuniFin's customers or other environmental public sector entities or organisations. Every project is analysed independently and only approved if there is a high likelihood of achieving long-term positive environmental effects.

Eligibility/Access Procedure

The majority of the eligible projects are long-term projects with maturities varying from 5 to 41 years.

Pros/Potential	Cons/Risks
•	•

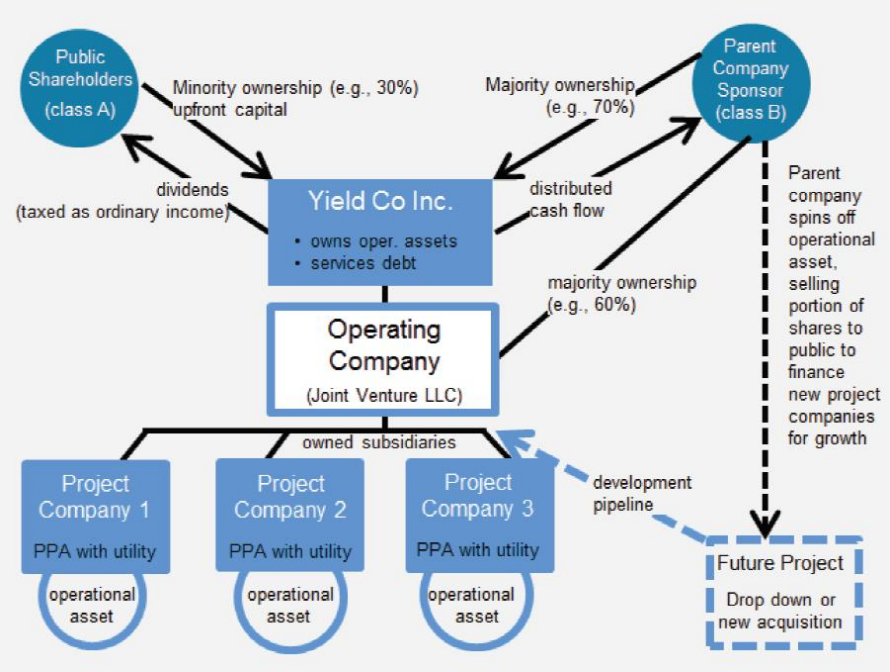
Relevant Documentation	Utilization / Availability Data
• https://www.munifin.fi/investors/green-bonds	Inaugural Green Bond was issued in September 2016 for USD 500 million with a maturity of 5 years. In the future MuniFin aims to issue one Green Bond per year or 15 per cent of its annual gross lending volume. MuniFin will also publish a Green Financing Report annually, starting in 2017.

Instrument Name	Country	ID
Terraform Power and Abengoa Yield	**Spain**	**9.1.3**
Instrument Type	**Direct/Indirect**	
Security/Yieldco	**Direct**	

Instrument Scope

Terraform scope (710 MW) - Renewable Energy large-scale plants (mainly solar and wind) power generation assets in attractive, high-growth emerging markets as well as in the US, Canada, UK and Chile. Acquired from the Spanish company Sunedison.

Abengoa Yield scope (523 MW) – Energy plants in North America, South America and Europe, with later plans for projects in Africa and the Middle East. Assets in energy generation encompass large scale RE plants, conventional power, and electric transmission lines.

Stakeholders	Scheme
• **Owners –** can be divided in majority owners and minority owners, hold a share of the Yieldco. • **Yieldco –** owns the operating assets and services debt • **Operating company LLC –** develops projects, assesses new acquisitions of existing projects • **Project SPVs –** subsidiaries owning the individual project/asset and administering the underlying contracts.	

Description

Divided growth-oriented public company, created by a parent company (e.g., SunEdison), that bundles renewable and/or conventional long-term contracted operating assets in order to generate predictable cash flows. Yieldcos allocate cash available for distribution (CAFD) each year or quarter to shareholders in the form of dividends. This investment can be attractive to shareholders because they can expect low-risk returns (or yields) that are projected to increase over time. The capital raised can be used to pay off expensive debt or finance new projects at rates lower than those available through tax equity finance, which can exceed 8%.

Yieldcos, sometimes referred to as "synthetic MLPs," are structured to simulate the avoided double-taxation benefit of MLPs and REITs. This means that rather than taxation taking place twice (once at the corporate level and again at the shareholder level), the yieldco is able to pass its untaxed earnings through to investors.

The parent company must own a majority share of the yieldco (Class B Common Stock), while public shareholders are entitled to a minority share (Class A Common Stock). The revenue generated from projects owned and/or operated by "operating subsidiaries" is passed through this structure to deliver returns to shareholders.

Renewable energy projects face some uncertainty during the development stage but tend to produce low-risk cash flows once they are operating In exchange for the opportunity to invest in relatively low-risk assets, yieldco investors receive 3%–5% returns and long-term dividend growth targets of 8%–15%. TerraForm Power's prospectus targets a 15% compound annual growth rate in CAFD over a three-year period. Investor return is directly linked to the operating performance of the underlying assets and the resulting CAFD, 70%–90% of which is distributed as dividends.

Yields as of August 204 were as follows:

	Portfolio	Renewable Assets (MW-electric)	Total Assets (MW)	Total Capital Raised	Market Cap	Yield (Annual)
Abengoa Yield Plc.	Solar, wind, conventional, electric transmission	710	1010; 1018 mi	$829 million	$3.0 billion	3.6 %
TerraForm Power, Inc.	Solar	523	523	$500 million	$3.0 billion	4.5% (expected)

Dividend policy and method for calculating CAFD varies by company: yieldcos distribute quarterly earnings less interest&tax paid, maintenance, capital expenditures, principal payments and reserves. About 70 - 90% of the remaining dividends is distributed to shareholders.

CAFD = [Quarterly Earnings] – [Interest and Tax paid + Maintenance and CapEx + Principal Payments] – [Reserves]

TerraForm Power's portfolio contains many small- to mid-size distributed generation (DG) projects. Two of the most notable assets within TerraForm's initial portfolio are the 46.5 MW "U.S. Projects 2014" and 19.6 MW "Summit Solar Projects." Each project is a conglomeration of 42 and 50 sites, respectively, with offtakers that include utilities, municipalities, commercial, and governmental entities. This profile differs from Abengoa Yield, which houses a mix of large, conventional, utility-scale solar and thermal projects including 86 miles of transmission lines. TerraForm Power's portfolio holds solar DG projects and is expected to acquire natural gas and hybrid energy assets in the future.

In order to retain favourable tax benefits and steady yields, the yieldco business model calls for acquisition of new generation assets as initial portfolio assets approach their contract expirations. This pipeline of assets, or "drop downs," is intended to fuel the yieldco with stable cash flows to deliver above-average dividend growth with below average risk. This drop-down schedule is critical to maintaining cash-flows and beneficial tax treatment and subsequently, is essential to the yieldcos future growth and viability as a long-term financing structure. To reduce the uncertainty of future cash flows and ensure access to assets, agreements such as right of first offer or call rights are common between the yieldco and the parent company.

Eligibility/Access Procedure

The subjects that can apply to the scheme are corporates, private/public individual investors, funds or customers of the energy companies offering the scheme, that is all the possible stakeholders that would normally invest in securities.

Pros/Potential	Cons/Risks
• Promotes renewable energy • Alternative security, higher yield than other securities (e.g. bonds), contracted revenue generates predictable cash flows. • Tax advantages • Capillary and affordability as an investment: can help RE and EE upscale.	• Alternative security, more risky that other securities (e.g. bonds). Performance depends on whether factors and regulatory stability. • Complex structure, internal administration more onerous. • If linked to parent company, risks to participate to its financial fates (e.g. risk of parent bankruptcy if not adequately isolated from parent company) • Increases focus on acquisition and takes it away from execution, too much reliance on parent company's ability to quickly upscale and execute flawlessly.

Relevant Documentation	Utilization / Availability Data
• https://financere.nrel.gov/finance/content/deeper-look-yieldco-structuring • http://www.bloomberg.com/news/articles/2014-06-13/abengoa-s-dividend-unit-raises-721-million-in-initial-offering • http://www.atlanticayield.com/web/en/company-overview/overview/ • http://solarpvinvestor.com/articles/1003_dividend-and-equity-growth-terraform-power-terp-and-terraform-global-glbl-investing-in-solar-energy/ • http://www.terraform.com/phoenix.zhtml?c=253464&p=splash	

Instrument Name	Country	ID
iHola Espana	**Spain**	**9.1.4**
Instrument Type	**Direct/Indirect**	
Security/Green Bonds	**Direct**	

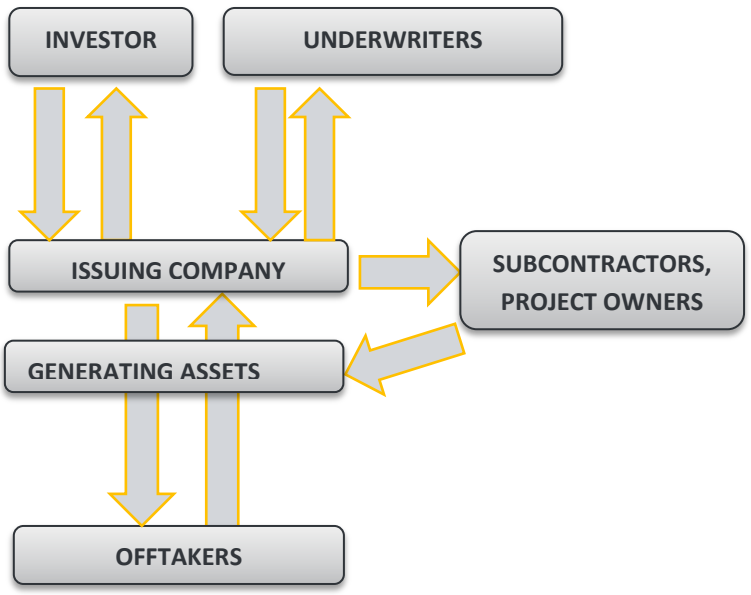
Instrument Scope

iHola Espana scope is:
-Renewable energy (hydro, geothermal, wind, solar, waves, tidal or 'other' non-fossil energy)
-Transmission and distribution that connect renewable energy
-Smart grids that improve efficiency and demand management of networks

Stakeholders

- **Investors –** buying the bonds, investing funds in the project portfolio, receiving dividends once portfolio starts generating revenues
- **Underwriters and other financial intermediaries:** financial institutions structuring the bond and putting it to market, lending to the issuing company, all for a fee. provide credit guarantees and credit enhancement products in secondary markets, thus modifying the risk profile of the underlying bond.
- **Issuing company –** issuing the bonds, pooling together and managing the underlying portfolio of assets, repaying the bond and the debt with their underwriters
- **Subcontractors, project owners, offtakers –** respectively constructing/selling the generating assets to the issuing company
- **Offtakers -** providing revenue to the issuing company in exchange for the power produced by the asset.
- **Credit rating agencies, regulators and auditors:** institutions responsible for verifying compliance with the standards for green bonds or established credit standards, regulators responsible for rules on capital markets.

Scheme



Description
Green bond launched from Iberdrola in 2014, totalling EUR750m, rated BBB, maturity 8.5 years, 4 times oversubscribed at them moment of launch. Iberdrola was only the second electricity utility (first was EDF) to issue a green bond and the first Spanish corporate to launch a green bond. Bond proceeds were used for the company's RE business, to refinance existing investments as per instrument scope. The third party opinion classifying the bonds as ''green" was provided by Vigeo (it advised on compliance with the Green Bond Principles as well as provide an opinion on issuer and the environmental purpose of the projects). The company also committed to a full transparency and to an annual reporting in the Green Bond section of its Sustainability Report. This particular bond also enables to invest in the renewables part of the business alone, not possible at the equity level since Iberdrola Renovables was merged back into the main group in 2011. The bond was priced with a zero NIP, in line with where a vanilla/brown bond would price and with a low coupon of 2.5%. This is the tightest spread on any tenor EUR deal since March 2010 and 41bps tighter than their 7yr deal from 6 months ago. The bond was 57% placed with green/social responsibility investors categorized as below: Fund managers = 68% Insurance & Pension funds = 21% Bank = 7% Others = 4% Germany & Austria = 28% France = 24% Iberia = 17% UK=14% Benelux=8% Switzerland = 3% Joint book runners were Santander, Bank of America Merrill Lynch, Goldman Sachs, HSBC, JP Morgan and Lloyds Bank.
Eligibility/Access Procedure
The subjects that can apply to the scheme are corporates, private/public individual investors, funds or customers of the energy companies offering the scheme, that is all the possible stakeholders that would normally invest in securities.

Pros/Potential	**Cons/Risks**
• can mobilize resources from domestic and international capital markets for climate change adaptation, renewables and other environment-friendly projects • senior class of securities • linked to predictable cash flows • good investment option for social responsible investors	• Linked to financial stability of their respective companies • Maintain the regulatory risk and implementation risk of other renewable energy / energy efficiency securities • Certain criteria need to be met to enter regulated capital markets • Market still illiquid for this product class

Relevant Documentation	Utilization / Availability Data
• https://www.iberdrola.com/shareholders-investors/investors/fixed-income/bonds • https://www.climatebonds.net/2014/05/perfecto-spains-iberdrola-issues-85yr-eur750m-104bn-bbb-very-tightly-priced-green-bond	

10. CROWDFUNDING AND OTHER PEER-TO-PEER LENDING

Crowdfunding is a form of alternative finance through which a project is funded by raising monetary contributions from a large number of people and giving in return either shares of the company operating the projects (equity crowdfunding) or revenues from the project itself (rewards crowdfunding).

Whilst we have not been able to uncover examples of EE crowdfunding for Hungary and Spain, in contrast Finland and Germany provide several examples that can be utilized as a reference. These examples are also further detailed in 10.1.

The **Finnish** company Lumituuli (see 10.1.3), for example, sells electricity to its part-owners (just like a mini-utility) and builds offshore and onshore wind plants with the proceedings, financing them entirely or in partnership with another financial institution. Other Finnish companies, like Joukon Voima (10.1.2), act as an intermediary between projects looking for funding and financiers, with the ability to structure equity as well as rewards-based solutions. In exchange, crowdfunding coordinators like Joukon Voima receive a service fee plus a small fee tied to the profitability of the project. Another case is that of Helsingin Energia (10.1.1): on one side it collects funds from its customers (through a levy on electricity production) to finance selected RE projects, on the other side it sells solar production to domestic customers in exchange for a monthly fee.

Most of the available crowdfunding platforms available mainly finance renewables and are generally not able to support large investment programs without co-financing, however they can prove efficient for small retrofits, energy efficiency interventions on single public buildings or for the installation of domestic renewable energy by a specific community (community funding).

In **Germany**, the platform Bettervest (10.1.4) is specifically aimed at EE financing. Money is collected on an escrow account until the funding goal has been reached and the EE project assessed by an external consultant. Bettervest then offers a reward-type crowdfunding, distributing a percentage of the savings and retaining a small fee (10% of the total funding plus 1% per year), until payback.

Some other platforms have the same functioning principle as Bettervest, but operate at an EU or even at a global level, such as the EE-focused Citizenergy (EU), Sparkfund (global) and the more generic Kickstarter (Citizenergy, 2016)..

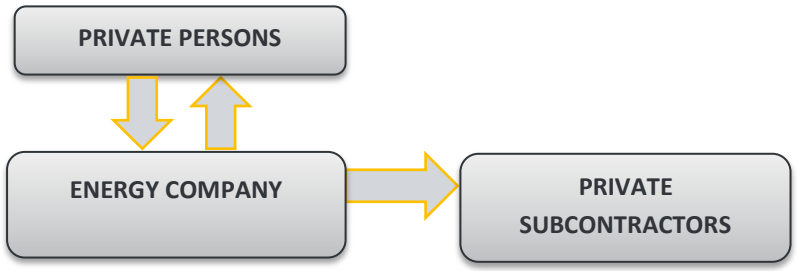
Crowdfunding is a very versatile financing instrument: it has the potential of gathering synergies from very diverse subjects and offers the advantage of a more distributed (hence lower) capital risk. However, it is not immune from potential risks related to the transparency and efficiency in the administration of the funds collected, especially before the project construction starts.

10.1. CASE STUDIES ON CROWDFUNDING

Instrument Name	**Country**	**ID**
Helen Oy – Solar panel crowdfunding	**Finland**	**10.1.1**
Instrument Type	**Direct/Indirect**	
Crowdfunding	**Direct**	

Instrument Scope

Helsingin Energia (energy company from Helsinki) sells renewable energy contracts that cost €1.71 more per month than normal electricity, and personal solar panels against a monthly bill. The funds that are collected this way for further construction of eco-friendly production.

Stakeholders	**Scheme**
• **Energy company (Helsingin Energia) –** building the power plants and selling electricity • **Private persons –** buying the products from Helsingin Energia • **Private subcontracting entities –** carrying out the works	

Description

Environmental Penny is Helsingin Energia's electricity product where customers can buy renewable energy while supporting further construction of eco-friendly production. Environmental Penny electricity costs €1.71 more per month than normal electricity. The fee is charged as basic charge in connection with electricity bill. For each customer, €3.42 per month will be deposited into the Environmental Penny account. The Environmental Penny committee consisting of energy experts decides how the funds are spent, for example building a solar power plant.

In addition, Helsingin Energia has a solar energy programme including a new solar power plant and a new service, where customers will receive the production of their personal solar panel against a monthly fee. Helsingin Energia is committed to building more solar energy production according to demand.

Eligibility/Access Procedure

The subjects that can apply to the scheme are customers of the energy company offering the scheme.

Pros/Potential	Cons/Risks
• Promotes renewable energy • The more the demand for renewable energy will grow, the more can be invested in building more renewable energy power plants	

Relevant Documentation	Utilization / Availability Data
• https://www.helen.fi/en/news/2014/aurinkovoimalaitos-suvilahteen/ • https://www.helen.fi/en/electricity/homes/electricity-products-and-prices/environmental-penny/	The Suvilahti solar power plant cost. 600,000 € (2015). The balance of the Environmental Penny account was 2,381,505.12 € in April 2016.

Instrument Name	Country	ID
Joukon Voima – Joukkorahoitus *Crowdfunding for sustainable energy projects*	**Finland**	**10.1.2**
Instrument Type	**Direct/Indirect**	
Crowdfunding	**Indirect**	

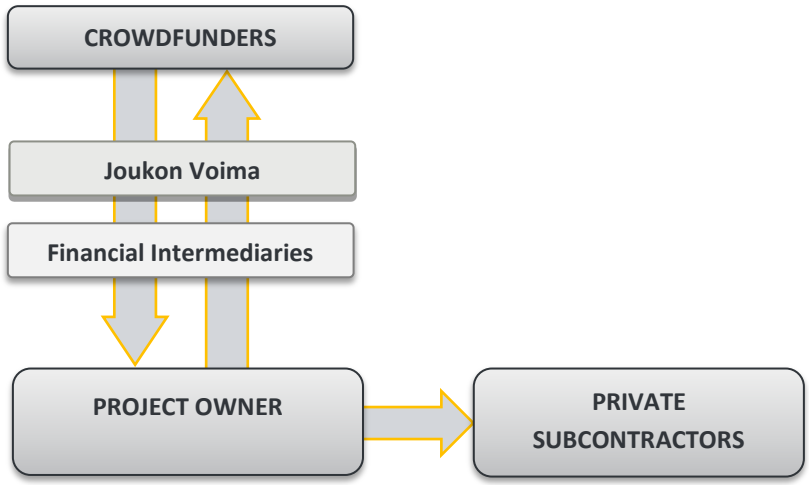
Instrument Scope

Joukon Voima is a company providing a marketplace for loan- and compensation-based crowdfunding. It helps those who are looking for funding to find financiers. The focus is on projects related to the sustainable consumption and production of energy.

Stakeholders

- **Joukon Voima –** providing the marketplace
- **Project owner –** looking for funding and implementing the project
- **Crowdfunders –** people funding the project
- **Private subcontracting entities –** carrying out the works
- **Financial Intermediaries –** administering the funds

Scheme



Description

Joukon Voima provides a marketplace for crowdfunding, helping the project owners to improve the visibility of their project and find people who are interested in funding the project. In addition to a service fee, the project owner will pay a provision to Joukon Voima from the crowdfunded amount, plus a small fee tied to the profitability of the project.
Joukon Voima organizes both compensation- and loan-based crowdfunding. In compensation-based crowdfunding, crowdfunders will receive a product or a service in return for their money. In loan-based crowdfunding, crowdfunders receive a bond that yields interest on their investment.
Joukon Voima collaborates with the Finnish web-based banking service Fundu. The funds are deposited in an escrow account with Fundu and the money cannot be withdrawn from this account unless the project reaches its minimum funding goal. If the minimum goal is reached, Joukon Voima then withdraws the money from the account at the end of the funding campaign and uses it to move forward with the project as described in the project documentation. If the minimum is not reached, crowdfunders will receive all their money back.

Eligibility/Access Procedure	
Subjects that can apply to the scheme are projects related to the sustainable consumption and production of energy: • Renewable energy, such as solar power, wind power or wood chip heating plants • Projects related to energy efficiency and electric transportation.	
Pros/Potential	**Cons/Risks**
• Sustainable energy projects can be implemented without large initial investments. • Crowdfunding will improve the visibility of the project • The project will gain the support and involvement of local community and customers.	• Project will fail if the company does not get enough financing via crowdfunding
Relevant Documentation	**Utilization / Availability Data**
• http://joukonvoima.fi/en/ • http://joukonvoima.fi/en/faq/ • http://joukonvoima.fi/artikkelit/joukon-voima-closed-a-600ke-crowdfunding-round-for-a-renewable-energy-powered-real-estate/	

Instrument Name	Country	ID
Lumituuli – Tuulivoiman joukkorahoitus *Crowdfunding for wind power production*	**Finland**	**10.1.3**
Instrument Type	**Direct/Indirect**	
Crowdfunding	**Indirect**	

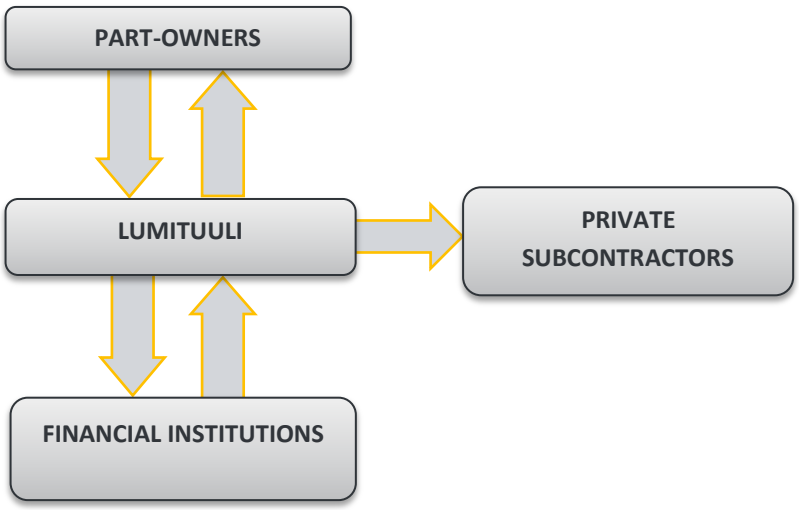
Instrument Scope

Lumituuli is a wind power company selling wind electricity to its part-owners. Company uses the revenues to build new wind power plants.

Stakeholders

- **Lumituuli –** building wind power and selling electricity to its part-owners
- **Part-owners –** own a part of the Lumituuli Company and by buying the electricity. They also act as crowdfunders.
- **Private subcontracting entities –** carrying out the works
- **Financial Institutions** – a part pf the wind power projects funding can come from financial institutions in addition to crowdfunding

Scheme



Description

Lumituuli is a wind power company owned by private citizens, companies, societies and Lumijoki community. Electricity is only sold to shareholders (and the surplus to Ekosähkö Oy, eco-electricity company in Finland) and thus the concept can be called customer-ownership.
Lumituuli uses crowdfunding to build new wind power plants: stock and bond issues are used to build more wind power and thus increase renewable energy production in Finland. The company has raised over 3.6 million € in total of crowdfunding through share and bond issues. Part of the financing for new power plants can also come from banks or other financial institutions.
According to the company's bylaw, revenues must be used to build more wind power instead of sharing the profits to the shareholders. The price of the electricity sold by Lumituuli is competitive in the Finnish electricity markets (for non-electric heated homes).

Eligibility/Access Procedure	
The subjects that can apply to the scheme are wind power companies.	
Pros/Potential	**Cons/Risks**
• Projects gain the support and involvement of local community and customers. • Investment on wind power and buying electricity from Lumituuli will further promote wind energy production in Finland	

Relevant Documentation	**Utilization / Availability Data**
• **https://www.lumituuli.fi/yhtio** • **https://www.lumituuli.fi/english.html**	

Instrument Name	Country	ID
Bettervest	**Germany**	**10.1.4**
Instrument Type	**Direct/Indirect**	
Crowdfunding	**Indirect**	

Instrument Scope

Initiatives of local energy efficiency retrofit (single as well as integrated envelope/lighting interventions) of individual public buildings / social housing, or of local renewable energy production (rooftop solar, microwind, CHP).

Stakeholders	Scheme
• **Bettervest –** collecting the funds from individual micro-investors and administering them to fund the projects in exchange for interests on profits, screening and proposing the project to investors • **Crowd –** selecting the project to fund among a list, collecting profits from their investments • **Private subcontracting entities –** carrying out the works • **Promoters –** promote projects and hire consultants for independent project assessment to be presented to Bettervest	

Description	
Bettervest is the world's first crowd-funding platform for energy-efficiency projects of companies, NGOs and local authorities that lets the crowd participate with high returns in the cost savings. The money is collected on an escrow account until the funding goal has been reached and the energy-efficiency project can be realized. Each project must have been analysed by an external energy efficiency consultant. A defined percentage of the savings is distributed to the crowd until the investment plus a previously agreed upon profit has been paid back. SMEs, NGOs and local authorities can finance their energy saving projects and reduce their CO2 emissions. Additionally, crowd-funding is a very good channel for marketing & CSR. Citizens get a sustainable investments opportunity that supports the energy transition and has a low risk profile compared to start up crowd-funding. Producers and sellers of energy efficient products as well as energy efficiency consultants can use bettervest as a sales and marketing platform. Bettervest gets a percentage of the overall funding sum for each energy-efficiency project for handling and administration (10% once after the funding has finished and 1% on a yearly basis, during the contract period).	
Eligibility/Access Procedure	
People willing to invest an amount of money starting at 50 € in EE projects and established enterprises, NGOs and local authorities with sensible EE/RES projects previously assessed by an independent consultant.	
Pros/Potential	**Cons/Risks**
• Can be revolving • Direct control on the projects financed, possibility for the individuals to become investors, profiting from the retrofits. • Capillary diffusion is possible with this model: suitable for smaller interventions. • Smallest risk of default, relatively safe business model.	• Private individuals not eligible for funding. • Complex platform to manage, risk of losing money if contractors fail. • Risk of incoordination of local EE/RES initiatives: anti-economical.
Relevant Documentation	**Utilization / Availability Data**
• https://www.bettervest.com/projekte/aktuelle-projekte	**So far, 46 micro-projects realised ranging between 5-600k € each. Yield of 5-12% on 5-10 years maturity.**

11. SOME INITIATIVES FROM OUTSIDE THE EU

Some global comparators can provide good indications for business models that may well become attractive in an EU context.

The **Empire State Building (ESB)** went through a Deep Energy Retrofit in 2009, one of the prime examples of the use of an Integrative Design Process for EE actions with pre-planned expenses. The total cost of the energy related retrofit projects for the entire building was approximately $106m. Promoters Johnson Controls, the Clinton climate initiative, and the Rocky Mountain Institute were able to reduce the ESB's energy use by 38%, by employing only $13.2 million to the total capital expenditures, to be paid for out of cash flow. Performance Contracts were also used for five of the eight projects implemented, to bring certainty in the cash flows (Empire State Realty Trust 2016).

The ESB programme highlights that one of the most controversial issues to be dealt in cases of huge energy efficiency retrofitting, is that of finding a financing model that works. Financing building retrofits through private capital alone would be difficult in today's lending environment. Solutions that combine private capital with publicly funded loan guarantees or other public financing mechanisms prove to be more viable (Harrington and Charmichael, 2009).

The **Public Sector Smart Energy (PSSE) Program of Barbados** is an IDB Sovereign-Guaranteed Loan to the islands with the objective of promoting and implementing the use of RES and EE measures, helping reduce Barbados' fossil fuel dependency (IADB, 2013).

Specific objectives of the Program are:

- to install RE systems in government buildings and retrofit them introducing EE technologies;
- to implement RE pilot project and studies across the islands;
- to assist with capacity building and public awareness in the energy sector.

The **IDB** (Inter-American Development Bank) Project Capital Markets solution for EE financing consist of an up to US$50 million **warehousing line** to originate and warehouse a pool of EE loans from Mexican SMEs, and an up to US$ 25 million partial loan guarantee for the securitization of the said pool. Projects are originated by energy service companies (ESCOs) and the structure in place facilitates financing from capital markets with better conditions and terms appropriate to the needs of these projects. The second stage of the project consists of a partial credit guarantee (PCG) program for up to a total amount of Mex$750 million (US$56 million) to support a green bond program backed by clean energy projects for up to Mex$2 billion (US$149 million). The Bank's PCGs will be issued under the Banamex Capital Market Facility (operation ME-X1013) approved in June 2012. The project will also mobilize up to US$19 million from the Clean Technology Fund (**CTF**) in the form of a second loss guarantee for the project portfolio, minimizing the green bonds' risk. In addition, the participation of the **IFC** is envisaged for possible co-financing and co-guarantee of both phases, to further strengthen the bonds' position (IDB, 2014).

The **IDB Energy Efficiency Guarantee Mechanism (EEGM),** in contrast, is a set of loan guarantees addressing barriers in the EE market for buildings in **Brazil**, such as lack of specific financing mechanism and related expertise. The EEGM contemplates to Brazilian-Real denominated guarantees:

- Technical risk guarantee, covering default due to technical reasons;
- Comprehensive Risk Guarantee covering defaults due to creditworthiness reasons.

A high profile international **ESCO** scheme is represented by the **Mahindra Towers (Mumbai)**, which had an impressive payback period of less than half a year for an overall investment of around $40m, implementing the Energy Conservation Mechanisms (**ECM**). The retrofit was performed by an ESCO scheme, thus avoiding Mahindra any upfront payments for the energy efficiency improvements and enabling the company to make payments over time through energy savings (NRDC, 2014).

When EE retrofits include the installation of mid-large scale RES, leasing in a commonly utilized financing mechanism. An example of it is Prologis, a Real Estate Investment Trust **(REIT)** specializing in large warehouses, many of which have rooftops appropriate for hosting solar arrays. Prologis has begun to lease rooftop space to solar system operators, for a rent that supplements the primary income obtained from renting warehouse spaces. The REIT does not own the solar project, and only receive rental income from solar rooftop tenants. These rentals are typically negotiated on a fixed rate, long-term basis (McKinley, 2014). The solar operator sells all energy off site to the local utilities through long-term power-purchase agreements (PPA), or sells it to a utility off taker (an entity that agrees to purchase future energy output, subject to contract).

12. FINAL CONSIDERATIONS

Among the alternatives considered, most energy efficient redevelopments at the district level are financed through loans and loan guarantees, both through national schemes and international lending bodies. This form of financing is already well-formulated, standardized in its clauses/procedures yet flexible as eligibility is still assessed on a case-by-case basis. However, access to these forms of lending tends to be reserved to large-sized or institutional players. Grants are also widely used but they have more specific conditions.

For more innovative financing and a wider participation by investors, the creation of an investment market for energy efficient retrofit projects, especially for individual buildings and small neighbourhoods segment, is strongly dependent on the availability of robust and clear financing mechanisms. This is necessary to allow investments to achieve a level of risk comparable with that of other more mature infrastructure investments. In particular this entails:

- certainty in the allocation of risk coverage responsibilities among stakeholders, especially in situations with already complex ownership structures
- certainty in the mechanisms of profit generation from energy savings
- ideally an upstream (capital) market linked to a downstream (projects) market

The lack of a ''retail lending ecosystem'' for private owners also limits the possibility for the market to scale-up to a level where securitization is effectively possible: whilst Green Bonds have mushroomed in the past 2 years, these are still mainly financing large scale RES. Thus, they are still de facto underutilized for EE renovations, particularly for those within the scope of New Trend.

As for investment risk, it can be reduced by allocating it to one single agent in charge of the entire retrofit operation, as in the ESCO-based models. Large ESCOs could also, with the support of financial institutions, access the securities market, further offsetting the risk. However, their complex operational structure makes the ESCO market unattractive to small or non-specialized players, restricting their main scope of action to medium-large scale interventions within their respective countries.

In this context, therefore, for the individual owner the most interesting innovative financing options in principle are crowdfunding, community RES/EE or indirect incentives (e.g. tax reductions or on-bill incentives). Of these, crowdfunding is still relatively underutilized with respect to its flexibility and potential. The tax incentives situation looks transient, very heterogeneous and would benefit from some international coordination. The same holds true for some other indirect mechanisms such as green and white certificates, especially given that EE/RES markets are not yet mature enough to allow an effective trading of these instruments. Other government-sponsored on-bill initiatives, such as the Green Deal in the UK, clashed against the complex ownership structure characterizing most real estate investments, failing to convince sufficient participation.

Finally we summarise this overview in Table 1 which indicates the strengths and weaknesses of the eight schemes considered. Going forward, one might expect to see greater engagement from the local utilities. Not only are they facing more regulations to increase energy efficiency, their business models are changing and there is a realisation that there is value in greater facilitation of end-user services. They have the institutional size and capabilities to coordinate local/regional initiatives, such as community-sponsored projects, becoming a better alternative than crowdfunding; they also have the operational capacity to embed ESCO-type structures for energy retrofits and other activities. They can add value to consumers through demand-response solutions and storage. They can also interact with financial institutions more effectively together with their knowledge of the local details. Distribution utilities have not been innovative in the past and it may take more government pressure for them to fully realise these potentials.

In conclusion, it is important that the New Trend platform is open and flexible to these business and financing models some of which are only starting to emerge, but have clear signals of substantial future impact. With this in mind, the subsequent deliverable in WP5.2 is intended to refine and test these indications in the context of specific business plans articulated through a suite of software financial planning spreadsheets to capture the main features of interest to investors and developers when securing funds.

Loans/loan guarantees	
STRENGHTS	WEAKNESSES
standardized conslidated structures flexible instrument case-by-case assessment = less risk loan guarantees can mobilize large amounts	borrowers rating may limit access needs careful structuring
OPPORTUNITIES	THREATS
to create EE-specific loans at retail level	crowdfunding as a more accessible option superficial KYC practices can lead to default

Grants	
STRENGHTS	WEAKNESSES
specific eligibility requirements relatively flexible instrument borrowers rating not a barrier	no control on risk after disbursement can create dependance on external aid can create market distorsions
OPPORTUNITIES	THREATS
micro-grants for individual owners	

International Financing	
STRENGHTS	WEAKNESSES
strong alignment with EU objectives large amounts available hughe risk-reduction potential	accessible by few players in most cases needs intermediation
OPPORTUNITIES	THREATS
further expand utiliastion of risk sharing facilities	increasing competition among dev banks countries' economical crisis can prejudice repayments/limit projects

ESCO/EPC	
STRENGHTS	WEAKNESSES
clear allocation of project risks responsibility on performance standardized contractual framework	complex organisations, entrance barrier less suitable for small EE retrofits specialization in specific retrofit types
OPPORTUNITIES	THREATS
can enter securitization by pooling projects together	more efficient organizational/contractual forms risk of default if scaling-up pace too high or projects underperform

Tax incentives	
STRENGHTS	WEAKNESSES
can serve individual small owners national coordination	complex mechanisms not easy to access lack of international coordination
OPPORTUNITIES	THREATS
process simplification through online platforms	a mass-adoption can be difficult to manage administratively misuse and frauds

DNO-sponsored projects	
STRENGHTS	WEAKNESSES
operational capabilities turnkey solutions for the retail customers can utilise ESCO model can access EU funds and securities	DNOs not flexible enough and needs reorganization exposed to technological disruptions and decreasing energy prices
OPPORTUNITIES	THREATS
create a downstream and upstream EE markets	disruptors and more flexible models could sweep away market opportunities more quickly

Securitization	
STRENGHTS	WEAKNESSES
market stabilization potential access to larger amounts can facilitate market expansion	not enough projects, pooling difficult markets not mature, not liquid enough perceived as exotics, risky assets
OPPORTUNITIES	THREATS
to create EE-specific loans at retail level	stricter regulation misuse and consequent systemic crises

Crowdfunding	
STRENGHTS	WEAKNESSES
suitable for small customers/indivudal owners more transparency non regulated	less control on projects = more underperformance risk relatively unknown, underutilized more difficult to raise capital to level
OPPORTUNITIES	THREATS
to become a credible alternative to loans and to EU-financed projects	stricter regulation lending products/EE market development makes crowdfunding superfluous

Table 1 - SWOT Analysis of the 8 Financing Mechanisms

13. REFERENCES

Climate Bonds Initiative (2014) Labelled green bonds data. Available at: https://www.climatebonds.net/cbi/pub/data/bonds (Accessed: 10 October 2016).

Climate Bonds Initiative (2015) BONDS AND CLIMATE CHANGE THE STATE OF THE MARKET IN 2015. Available at: http://www.climatebonds.net/files/files/CBI-HSBC%20report%207July%20JG01-Spreads(1).pdf (Accessed: 10 October 2016).

Climate Bonds Initiative (2016) Explaining green bonds. Available at: https://www.climatebonds.net/market/explaining-green-bonds (Accessed: 10 October 2016). (Accessed: 27 October 2016).

Ctizenergy (2016) Position Paper. Fostering crowd-based investments in renewables and energy efficiency. Available at: https://eurocrowd.org/wp-content/blogs.dir/sites/85/2016/06/2016-06-Position-Paper-Fostering-Crowd-Based-Investment.pdf (Accessed: 10 October 2016).

Eckhouse, B. (2015) As Abengoa struggles, Abengoa yield makes plans for future. Available at: http://www.bloomberg.com/news/articles/2015-11-25/as-abengoa-struggles-abengoa-yield-makes-plans-for-future (Accessed: 27 October 2016).2016).

EEFIG (2015) EEFIG Report. Available at: http://ec.europa.eu/energy/sites/ener/files/documents/Final%20Report%20EEFIG%20v%209.1%2024022015%20clean%20FINAL%20sent.pdf (Accessed: 10 October 2016).

Energycities (2014) Financing schemes increasing energy efficiency and renewable energy use in public and private buildings. Available at: http://www.energy-cities.eu/IMG/pdf/infinite_solutions_comparative_analysis_web.pdf (Accessed: 10 October 2016).

EU Commission (2011) COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Energy Efficiency Plan 2011. Available at: http://ec.europa.eu/clima/policies/strategies/2050/docs/efficiency_plan_en.pdf (Accessed: 10 October 2016).

EU JRC (2005) Energy service companies market in Europe, status report 2005. Available at: http://iet.jrc.ec.europa.eu/energyefficiency/publication/energy-service-companies-market-europe-status-report-2005 (Accessed: 10 October 2016).

EU Parliament - Members' Research Service (2015) Smart electricity grids and meters in the EU Member States. Available at:

http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568318/EPRS_BRI(2015)568318_EN.pdf (Accessed: 10 October 2016).

European Commission (2015) European Initiative on Smart Cities. Available at: http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm (Accessed: 10 October 2016).

Harrington, E. and Charmichael, C. (2009) Http://www.Rmi.Org/Content/Files/ESBCaseStudy.Pdf. Available at: http://www.rmi.org/Content/Files/ESBCaseStudy.pdf (Accessed: 10 October 2016).

House of Commons (2013) Local energy and climate change. Available at: http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenergy/180/18008.htm (Accessed: 10 October 2016).

IADB (2013) BARBADOS PUBLIC SECTOR SMART ENERGY (PSSE) PROGRAM. Available at: http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=37037578 (Accessed: 10 October 2016).

IDB (2014) ME-L1150: Capital markets solution for energy efficiency financing of Mexico. Available at: http://www.iadb.org/en/projects/project-description-title,1303.html?id=ME-L1150 (Accessed: 10 October 2016).

Karnouskos et al., S. (2010) Field trials towards integrating smart houses with the smart grid. Available at: https://www.semanticscholar.org/paper/Field-Trials-towards-Integrating-Smart-Houses-with-Karnouskos-Weidlich/02ff8be74f7757c7999464f28897e8b03212e86f (Accessed: 10 October 2016).

KfW (2009) Energy efficiency, corporate environmental protection and renewable energies. Available at: https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/index-2.html (Accessed: 10 October 2016).

McKinley, B. (2014). Using REITs to invest in utility scale solar projects. Cornell Real Estate Review, 12, 60-68

NRDC (2014) Retrofitting Mahindra Towers: How an Innovative ESCO Model Lowers Energy Bills With No Upfront Cost. Available at: https://www.nrdc.org/sites/default/files/esco-energy-retrofit-mahindra-CS.pdf (Accessed: 10 October 2016).

NREL National Renewable Energy Lab (2014) A deeper look into Yieldco structuring. Available at: https://financere.nrel.gov/finance/content/deeper-look-yieldco-structuring (Accessed: 10 October

OECD (2012) Kyoto Fund. Available at: http://www.iea.org/policiesandmeasures/pams/italy/name-36611-en.php (Accessed: 18 October 2016).

OECD et al. (2016) GREEN BONDS: COUNTRY EXPERIENCES, BARRIERS AND OPTIONS. Available at: https://www.oecd.org/environment/cc/Green_Bonds_Country_Experiences_Barriers_and_Options.pdf

OFGEM (2015) Energy company obligation. Available at: https://www.ofgem.gov.uk/environmental-programmes/eco (Accessed: 27 October 2016).

Reuters (2013) Europe to follow Italy's lead on smart meters. Available at: http://www.reuters.com/article/energy-efficiency-smartmeters-italy-idUSL5N0EA3HL20130530 (Accessed: 10 October 2016).

Sinkkonen, A. et al. (2013) Barriers of ESCO Service Business in Finland. Available at: https://www.doria.fi/bitstream/handle/10024/91841/ESCO%20Success%20Barriers%20(NESDyM).pdf?sequence=2 (Accessed: 27 October 2016).

Solarplaza Yieldcon (2015) Yieldco benchmark: Canadian and European outperform US listed funds on yield. Available at: http://www.yieldcon.com/news-input/2015/5/7/yieldco-benchmark-canadian-and-european-outperform-us-listed-funds-on-yield (Accessed: 27 October 2016).

UK Government (2013) Community Energy Call for Evidence. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207920/community_energy_call_for_evidence.pdf (Accessed: 10 October 2016).