

Financing Ambitious Local Climate Objectives

D.2.1. Report on general aspects FLC
Deliverable leader: SuMa Consulting

WP 2 – FLC Vehicle
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Table of Contents

1	INTRODUCTION.....	5
2	IDENTIFICATION OF MAIN CATEGORIES OF BARRIERS.....	6
2.1	The return is deemed insufficient.....	6
2.2	Cashflow problem	6
2.3	Creditworthiness is insufficient	7
2.4	Status quo of credit position/lending capacity	7
2.5	Economic lock-in	7
2.6	Financing project development cost.....	8
3	SOLUTIONS MAPPING	9
3.1	Preliminary remark – Alternative solution levels micro, meso and macro.....	9
3.2	Overview of solutions identified	9
3.2.1	Aggregation/bundling (meso)	9
3.2.2	Intracting – contracting (meso).....	9
3.2.3	Climate Plan Benefit contribution (meso/macro)	10
3.2.4	Deferment of payment of revenues from sale of EU Allowances (EUAs) to industry (macro)	10
3.2.5	Guarantee – Credit risk (micro/meso/macro).....	10
3.2.6	Performance guarantee – performance risk (micro/meso)	11
3.2.7	Third party financing (micro/meso)	11
3.2.8	Retention of subsidies (meso/macro).....	11
3.2.9	Credit Default Swap (meso/macro).....	12
3.2.10	Optimisation of use of real estate (micro/meso)	12
3.2.11	Compensation mechanism (flexibility mechanism) (meso/macro)	12
3.2.12	Sale & lease back (micro large/meso).....	13
3.2.13	Usufruct & lease back (micro large/meso)	13
3.2.14	PACE (Property Assessed Clean Energy) (meso)	13
3.2.15	On-bill financing (meso/macro).....	14
3.2.16	Factoring (micro large/meso)	14
3.2.17	Securitisation (meso/macro)	15
3.2.18	Forfaiting (micro large)	16
3.2.19	Domestic Offset Projects (meso/macro):	16
3.2.20	Green investment scheme/domestic greening (Meso/macro)	17
3.2.21	Pay-for-performance (alternative investment) - (micro-large/meso)	19
3.2.22	Equity injection (micro-large/macro/meso)	21
3.2.23	Flexible loans (micro/meso).....	21
3.2.24	Loan with below market interest (form of concessional loans) – (micro/meso).....	21
3.2.25	Community Land Trust (meso)	22
3.2.26	Hybrid Housing market	22



3.2.27	Debt Fund (meso/macro)	23
3.2.28	Equity Fund (meso/macro)	23
3.2.29	Pledge fund (micro – for large projects)	23
3.2.30	Insurance (micro/meso).....	23
3.2.31	Green Bond Plus (GOPlus) (meso/macro).....	24
3.2.32	Crowdfunding (micro /meso).....	25
3.2.33	Crowdsourcing (meso/macro)	25
3.2.34	Grouped purchase (meso)	26
3.2.35	Membership Card System – (meso/macro).....	26
3.2.36	Joint incentive (↔ split incentives) (meso/macro).....	27
3.2.37	Green Flexible Reward (meso/macro).....	28
4	DEVELOPMENT OF ADEQUATE SOLUTIONS.....	30
4.1	Overview.....	30
4.2	High ambition level as ultimate reference point.....	30
4.3	Root-cause analysis (in concreto).....	31
5	DEVELOPING SOLUTIONS: ADOPT A FRESH PERSPECTIVE	32
5.1	Combining solutions and implementation planning (phasing).....	32





1 Introduction

The aim of the FALCO-project is to induce investments that go beyond business as usual by supporting potential investors with solutions that address persistent financial and non-financial barriers. Focus is on three types of investments:

- Energy efficiency measures for SME's;
- Renovation of private buildings (e.g. apartments / private houses / private schools / ...);
- Renovation of public buildings.

Based on financial and non-financial barriers project owners encounter, FALCO partners develop adapted solutions. The work to develop the solutions has been organised in 'breakthrough projects'. Before implementing the solutions, a due diligence exercise is being performed.

This deliverable contains the financial barriers & solutions matrix. Before developing financing solutions, efforts have been made to identify main investment barriers to energy efficiency and energy renovation. This deliverable, whilst situated in the Work Package on overarching solutions, contains general information for identifying appropriate (parts of) solutions for each of the breakthrough projects AND overarching solutions.

The financial barriers & solutions matrix matches more than 30 alternative financing solutions identified with six key financial investment barriers that are generic to most energy renovation projects. In addition, these measures were evaluated as to their potential to address each of the generic barriers, taking into account low, medium and high climate ambitions. Furthermore, these financial barriers and solutions were documented and offered as a guidance to find solutions to the financing barriers encountered upon the development of financial solutions for the breakthrough projects in work package 3. This document will be further updated with new solutions that we will come across during the project. Finally, this matrix will also help as to speed up the development of the overarching solutions aligned on the solutions developed in the breakthrough projects.

2 Identification of main categories of barriers

We identified six categories of barriers related to the financing of Energy efficiency investments. For each of these barrier categories we identify root-causes, as a first step in finding solutions that will lift the barrier.

The sections below describe each of the barriers.

2.1 The return is deemed insufficient

Inadequate returns can be caused by several factors:

- Project definition problem e.g. : 1) Cherry picking instead of blending of energy efficiency investments 2) a wrong combination of measures and/or the singular focus on energy efficiency discarding additional return (for example, the combination with renewable energy and/or benefits related to process re-engineering)
- Inefficiency problem: this relates to the implementation of the investment (spreading of smaller investments instead of one project combining multiple measures; many small projects instead of bundling many projects into a larger);
- Myopic view on return: the return is calculated without taking into account co-benefits related to the energy investment project (e.g. an energy efficient building can obtain a higher price on the rental market);
- Third-party benefit problem: the project creates economic value, but the value doesn't automatically go to the investor. This is notably the case in the so-called split incentive or lessor/lessee dilemma;
- Monetising problem: this is the case where the economic value is not automatically created but instead a monetising action before it can be translated into cash flows. For example, an emission reduction in the context of a domestic offset projects scheme will require verification/certification before it can be used as a tradable compensation instrument;
- Risk/reward problem: in adequate risk management, notably as a consequence of inefficient allocation of risks (e.g. to parties that are not well-equipped to manage that particular risk), is likely to be translated in a higher risk premium charged by the investors

2.2 Cashflow problem

A cash flow problem arises where the returns are spread over a longer period so that the monthly instalments as initiated with the investments exceed the returns.

Hence, the following factors can cause cash flow problems, that may well occur simultaneously:

- The reimbursement period is too short (e.g. loan period is too short);
- Planning problem: the cashflow arises as a consequence of an adequate sequencing of investment measures (investment measures which would be back times could reduce cash flow problems for investment measures with longer payback times);

- Return problem: cashflow problems can also occur as a consequence as a low return on the investment (cf. supra);
- Performance risk: for energy efficiency investments the return is to a large extent linked to the performance of the energy efficiency measures, and more precisely the cost reduction associated therewith. Hence, to cover the performance risk, an investor may lower the expected cost reductions as a way to cover this risk. This may generate or increase a cash flow problem.

2.3 Creditworthiness is insufficient

A creditworthiness problem could be caused by several factors (or a combination thereof):

- Revenue problem: the borrower's income is too low to be able to take out a new loan/ commit to additional debt;
- Credit margin is used up;
- Age problem: too old to get a loan (Life expectancy issue);
- Performance risk/ cost reduction uncertainty.

Remark: most of the financing will be done on a recourse basis meaning that apart from the cash flows coming from the project, a bank or an investor will request real (mortgage) or personal guarantees. Hence, in most cases (i.e. with the exclusion of non-recourse financing) the return on investment of particular energy efficiency investment project is irrelevant to the investor as long as the borrower is sufficiently creditworthy and provides for sufficient guarantees so as to cover the counterparty/credit risk.

2.4 Status quo of credit position/lending capacity

This barrier pertains to the willingness of the renovator not to make use of his lending capacity.

Possible causes :

- Willingness to safeguard to the lending capacity for future investments/unforeseen costs;
- Budget neutrality: internal policy decision requiring operational expenses to be covered by the investment project returns (or budget commitment in the context of the EU Stability Pact).

2.5 Economic lock-in

Economic lock-in is the situation where the revenues/cost reductions from previous energy

efficiency investment projects cannot be used for further energy efficiency investments. Lock-in can be explained by the following factors:

- Multiple decision moments:
- Cost reductions take the form of avoidance of expenditure and, hence, tend to be invisible and will by default automatically benefit the general budget.

2.6 Financing project development cost

Project development cost add to the upfront investment cost and therefor can jeopardize investment. Important, development cost can be linked to one or more of the following factors:

- Partitioning of the whole renovation in several smaller renovation projects increases transaction costs:
- Complexity of the renovation:
- Efficiency of the development stage:
- Freeriders problem.

3 Solutions mapping

3.1 Preliminary remark – Alternative solution levels micro, meso and macro

We consider different solution levels:

- Micro: this is the level where the solution only considers the individual project);
- Meso: this is the portfolio or programme level. The solution considers multiple projects to be executed in a particular investment period, e.g. a project portfolio or (multiannual) climate plan (multiproject & single period);
- Macro: this the level where we consider a system transition (the solution considers coupling of projects, project portfolios /programme in time) = multi-project & multi-period.

For each of the solutions presented below we indicate (in brackets after the title) what level is most suited for the solution (micro, meso or macro).

3.2 Overview of solutions identified

3.2.1 Aggregation/bundling (meso)

Aggregation or bundling can reduce the cost of energy efficiency measures or increase the return of these measures (notably through economies of scale or scope). In addition, aggregation can spread the risk associated with energy efficiency investments. Aggregation is an umbrella concept encompassing many different forms:

- Aggregation of the measures: bundling multiple measures at the level of a single renovator, bundling a single measure with multiple renovators, bundling multiple measures of multiple renovators;
- Aggregation of needs and joint satisfaction of needs: bundling (heat/energy/space/mobility) needs of multiple renovators, and addressing these needs via common measures (e.g. a common CHP or windmill, carsharing, co-housing);
- Financial bundling: Pooling of financial resources (e.g. energy renovation cooperation);
- Operational bundling: aligning the execution of multiple energy renovation investments at the level of one or multiple renovators.

3.2.2 Intracting – contracting (meso)

Interacting pertains to an internal agreement within a single organisation to solve split incentive questions between departments / business units. More in particular, it provides that when one department invests to the benefit of another department, the investing department will receive in return (a part of) the economic benefits provided to the beneficiary department by the investment. Mutatis mutandis, a similar approach could be adopted when the investing party and the beneficiary are not part of the same organisation. Indeed, the investment can be made subject to a prior agreement by the third party benefiting from the investment to return part of the economic value of that benefit to the investing party.

For more information see the Guidebook on intracting:

http://www.energy-cities.eu/IMG/pdf/guidebook_intracting_web.pdf

3.2.3 Climate Plan Benefit contribution¹ (meso/macro)

In this approach, whenever a (local) authority investment in the public space provides benefits for a well-defined group of citizens or enterprises, the investing Authority claims back part of the value added created by the investment from the beneficiaries (e.g. via real estate taxes). This approach doesn't necessarily need to be linked to energy efficiency investments nor renewable energy.

3.2.4 Deferment of payment of revenues from sale of EU Allowances (EUAs) to industry (macro)

This pertains to the possibility to 1) defer – e.g. with one year - the part of the revenues from the sale of EUAs that is passed through to industry every year, and 2) use these means to invest in energy efficiency measures or renewable energy. The impact thereof is similar to a loan from industry to the energy renovation/renewable energy market.

Note that the delay could be limited to the industry companies benefiting from an accelerated implementation of ambitious (local) climate change action plans (e.g. industry sectors with regard to insulation, renewable energy, building, glass, etc.). Note that similarly to a 'loan' the payment delay could be compensated through granting a limited (below-market) interest on the sums really. This may be especially relevant for companies that do not benefit from an acceleration of the implementation of local climate change action plans. If this approach is adopted annually, a sizeable and growing amount of financial means will be made available for the energy transition.

Remark: this solution requires the cooperation of the (Flemish) regional authority OR could be organised on a voluntary basis with industry in return for a commitment to invest these sums in energy renovation and/or renewable energy sectors. Many of the industry sectors under the EU ETS, benefit (in)directly from growing the energy efficiency and renewable energy markets.

3.2.5 Guarantee – Credit risk (micro/meso/macro)

A guarantee transfers the credit risk (counterparty risk) from the creditor to a third party with a more solid creditworthiness for a marketable collateral. This reduces or eliminates the Credit risk/counterparty risk.

Guarantees come in many forms: the risk can be totally or partially transferred, the rank of the creditors can differ, and the terms and conditions for accessing the guarantee (e.g. first, second or third tranche of losses) can differ substantially. Obviously, this transfer of risk will bear a price tag.

¹ In Dutch (Klimaat)planbaten

3.2.6 Performance guarantee – performance risk (micro/meso)

Performance uncertainty with regard to energy efficiency measures may impact in several ways on the financial cost of the investment, as it may impose a risk premium to cover creditworthiness risks of the borrower.

Remark: the effectiveness of a performance guarantee as an instrument to provide adequate cover against performance risk, is directly linked to the creditworthiness of the party offering the guarantee. Indeed, as the performance guarantee provides for an economic compensation in the event of underperforming measures, the ability to pay said compensation will be paramount. Hence, the performance guarantee may be that increase the creditworthiness of the ESCO (or other party) providing the guarantee, for example by increasing the equity of the ESCO.

3.2.7 Third party financing (micro/meso)

In a Third-Party Financing (TPF) solution a third party will take an energy (renovation) investment on its balance sheet, in consideration of a (monthly) payment covering the value of investment and a financial remuneration of the TPF-provider. If such payments are aligned on the expected savings the TPF solution can have a positive or neutral impact on operational costs of the TPF beneficiary.

Note that :

- TPF solutions combine well with energy performance guarantees.
- For public sector TPF beneficiaries, TPF solutions may – depending on the characteristics of the investment - be used to structure energy efficiency investments in an provide ESR neutral way (or reducing the ESR impact of the investment).

3.2.8 Retention of subsidies (meso/macro)

Retention of subsidies in essence boils down to a TPF with conditional repayment /compensation of the TPF-provider. The sale or transfer of the real property is the condition that triggers the payback of TPF sums. In addition, the financier receives the agreed-upon remuneration insofar the real estate sold/ transferred generates an inflation corrected (i.e. net real) surplus value. To secure the payment, a mortgage (secondary rang) is vested on the real estate to the benefit of the financier.

Remark: insofar the renovation reduces the energy bill, it may be relevant to bring forward in part the repayment of the investment, instead of waiting for the sale or transfer of the real estate. Indeed, as the lower energy bill will free up some repayment capacity, accelerating repayment will reduce the outstanding capital that needs to be remunerated. In addition, this allows (public authority) to re-invest its financial means more rapidly.

For a practice example see “Dampoort knapT OP!”²

²https://samenlevingsopbouwgent.be/wp-content/uploads/sites/6/2016/12/Brochure_Dampoort_knapt_op_v4.pdf

3.2.9 Credit Default Swap (meso/macro)

A credit default swap (CDS) can be used as an insurance of a portfolio of bonds or debts. In case the bonds issuer cannot repay the means collected through the bond (and this defaults), the credit default swap will compensate for the loss.

Example: Suppose company A has a return on equity of 10% and issue bonds. Party B has a bond issued by A (B= bondholder). B wants to cover his counterparty risk via a CDS with party C. The CDS contract provides that B will pay C a (fixed) sum per year, e.g. 5% of the principal amount (nominal bond value). If the bond-issuer A defaults, C will pay B de principal. B has no longer a credit/counterparty risk on A but loses part of his return. B has a conditional credit risk on C namely if A defaults and C cannot comply his commitment to compensate B.

3.2.10 Optimisation of use of real estate (micro/meso)

This pertains to making better economic use of current real estate owned with a view to earning income that can financing additional energy renovation measures, for example:

- Valorisation of unused areas: for example, revenues from a (rooftop) concession for renewable energy generation or revenues from the sale of the energy production on the roof.
- Allocate new (temporary) uses/destination: increase income by (temporary) shifting the use from to commercial activities; renting part of a social housing building to wealthier consumer segments (i.e. other than social tenants);
- Increase intensity of use: here we search for suboptimal uses in terms of space or time. E.g. more efficient office space management (reducing the m² needed per employee) or the valorisation of a parking rom an apartment during the day c.q. a company parking outside office hours.
- Optimisation at portfolio level: reorganising of real estate portfolio (notably through acquisition/sales transactions so as to achieve a closer alignment of the portfolio of the organisation's needs. Revenues from the sale (or other economic valorisation) of real estate can be used for financing deeper energy renovation.

3.2.11 Compensation mechanism (flexibility mechanism) (meso/macro)

It pertains to a (temporary) exemption from a costly legal obligation (for example, imposed by a local urban development regulation) in consideration of a commitment to investment part of the costs avoided (investment duty – vest efforts obligation) or to realise a particular result (for example, achieving a low energy home = obligation of result). The exemption creates frees-up the financial means required to do the energy renovation investment (without negative impact on public budgets and/or project returns).

Variants: a) compensation within the same real estate/building (for example the authorisation to add a building layer on a house/apartment in return for renovating the building to a near zero energy consumption; b) compensation via an investment in the building of a third party

(e.g. relaxing the applicable urbanistic rules for a new building subject to the energy renovation of another, existing building; c) alternatively compensation could be limited to a financial compensation, for example, in the form of a contribution of an energy renovation fund.

3.2.12 Sale & lease back (micro large/meso)

In a sale & lease back transaction the original owner sells his property and uses the proceeds from the sale to finance the renovation of the real estate sold. At the same time the former owner leases this renovated building from the new owner, whereby the lease agreement payments cover both the use of the real estate, as well as financing cost incurred by the lessors to purchase the real estate.

Again, this solution has multiple variants. For example, the actor who will perform the renovation investment may differ (the old or the new owner). Indeed, the original owner may accept a lower sale price (covering only part of the sales value) in consideration of the new owner's commitment to execute the agreed upon energy renovation investments.

3.2.13 Usufruct & lease back (micro large/meso)

In this construction a usufruct is vested on the real estate. The naked owner uses the (lump) sum he received in consideration of the usufruct to finance energy renovation investments in the real estate on which rest the usufruct. At the same time, the real estate is leased back by the naked owner (or a third party) whereby the monthly lease amounts are aligned on

This option may be relevant for execution of ambitious renovation programs in budget neutral way, as the investments are offset by the revenues from the sale of the usufruct. For the financier having bought the usufruct, the usufruct guarantees the reimbursement of the cost of the usufruct (Note that said guarantee is limited by the lease value of the real estate covered by the usufruct).

Note that this solution has not yet been tested.

3.2.14 PACE (Property Assessed Clean Energy) (meso)

A system of Property Assessed Clean Energy (PACE) has been used in the USA for financing energy renovation investments. PACE provides links the debt associated with the financing of the energy renovation to the real estate, and not - as customary - the person of the lender. Hence, in the case of a sale or termination of a lease, the debt remains with the real estate transferred to the successive owners /lessees.

Remark 1: this may be relevant to avoid energy renovation standstill with owners that are senior citizens and to alleviate the problem of split incentive in the landlord/tenant relation? For further information see: <https://www.renovateamerica.com/financing/hero/what-is-pace-financing>

Remark 2: interestingly PACE in the US is combined with securitization. The government (or other asset originator) provides for the financial means to build a portfolio of PACE loans. Once the portfolio has reached a sufficient size (> 100MEUR) it is refinanced (via securitization using a special purpose vehicle) on the market. Hence, the government

accelerates the recovery of (a large part of) its originally invested means, which enables it to finance additional PACE loans.

Remark 3: EUROPACE (a horizon 2020 project) started in 2017. This project will develop a European variant of the US PACE, test it in selected European markets, and if successful prepare the rollout. For further information, see :

- https://ec.europa.eu/energy/sites/ener/files/documents/1.5_europace_eduard_puig_maclean_final.pdf
- <http://www.europace2020.eu/europace-talks>

3.2.15 On-bill financing (meso/macro)

This solution is similar to the PACE approach. In this case, however, the energy investment is not made (prefinanced) by the government, but by a utility supplier. The latter recovers his investments by adding an amount to the monthly invoices for his deliveries. An alternative would be that the Distribution Network Operator adapts his tariffs to facilitate the recovery of the investments.

3.2.16 Factoring (micro large/meso)

Factoring is a financial transaction in which an enterprise sells its accounts receivable (i.e. invoices) to a third party, the factor, at a discount. Factoring receivable assets helps an enterprise to dispose almost immediately of cash.

Forfeiting has some features in common with factoring.

Factoring is a form of debtor financing, whereby an enterprise transfers his invoicing and debtor risk to a specialized company, the factoring company. In exchange for a payment to this company, the entrepreneur immediately receives his money. He therefore does not have to wait until his invoices have been paid.

The debtor portfolio is outsourced to an external company; the factor. This factor can be limited to just financing the debtor portfolio, but the client can also choose to outsource the debtor management and collection to the factor, whereby the entire debtor administration is entrusted to the factor. The company that has transferred or sold the debtor portfolio to the factor usually receives a percentage of the turnover on transfer to the factor (the sales amount minus a percentage for the factoring company in connection with costs and interest, but also a deduction to risk of default). This is called advance payment and is on average between 80 and 90%. Once the debtor has paid, the company that has transferred its debtors usually receives a residual amount.

The factor sets limits for each debtor within which the affiliated company can deliver. The standards are generally broader than with bank financing. For example, foreign debtors can often be included in the cover without any problems.

Factoring is used (just like securitization, see below) for the activation of future income (illiquid assets). The idea with factoring is mainly to be able to dispose of outstanding debts early.

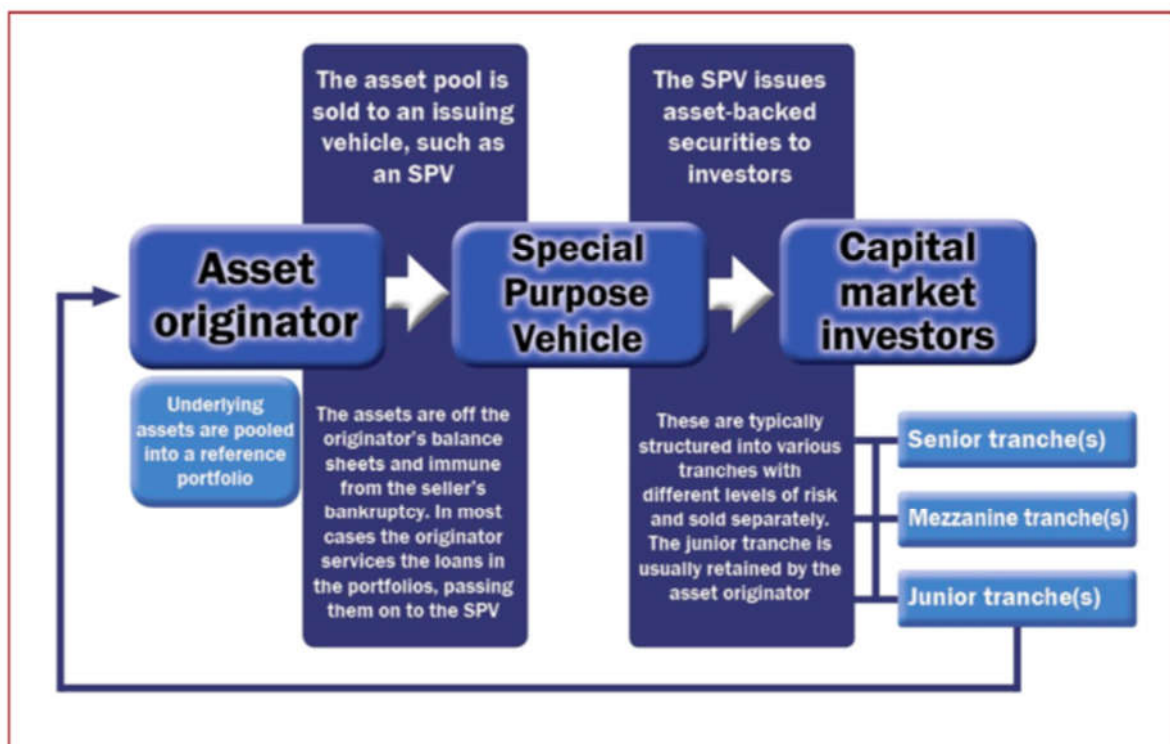
The difference with securitization is that with factoring:

- Factoring usually pertains to debts that are payable in the short term, for example. invoices for which 30, 60 or 90 days were given to customers as payment term.
- Factoring doesn't require a separate SPV, but a portfolio of debts is transferred to a factoring company that makes money available in the form of an advance and is then paid by the creditor himself on the due date. As mentioned, it often concerns a short-term solution (usually cheaper than cost for overdraft (kaskrediet)).

3.2.17 Securitisation (meso/macro)

Securitization refers to the transformation of non-negotiable assets in liquidities thereby creating an additional source of financing. In other words, securitisation transforms future revenue streams into readily accessible financial means.

The asset originator, e.g. the party providing loans, and more in general the original owner of the accounts receivable, sells a portfolio of receivables (who will generate a revenue stream over a longer period) to a special purpose vehicle (SPV). Subsequently the SPV issues Asset Back Securities (ABS), i.e. securities covered by the revenues from the portfolio of receivables. The ABS may take the form of a bond. With the revenues from the sale of these ABS, the SPV pays the asset originator the agreed upon price for the receivable portfolio. The ABS are often issued in several tranches with different risk profiles (and associated returns) to accommodate different investor profiles. As the assets are located in a separate SPV they are shielded from the assets & liabilities from the asset originator. The latter will retain 5% of the 'retention requirement' of the nominal amount of the assets sold to the SPV - Capital Requirements Regulation (art. 405 and 409 CRR).



Apart being a source of refinancing, securitisation:

- a) Secures large investment amounts in the market (this is mainly relevant at macro/meso level and pertains to the capital adequacy requirement for banks) and
- b) in some cases, a lower financing cost.

Additional read: “Stimulating private market development in green securitisation: the public sector agenda”³.

3.2.18 Forfaiting (micro large)

Forfaiting is a form of refinancing solution that allows the sale of accounts receivable to a financial institution (most mainstream banks offer forfaiting services) or a forfaiting fund, so as to allow the seller to free-up his working capital tied up in the accounts receivable. The sale can be organised on a recourse or non-recourse basis. In the latter case, the sales price will include a risk adjusted discount (to take into account) on top of the discount taking into account the time value of the forfaiting service.

Forfaiting has a number of features similar to factoring and securitisation

- Like factoring: it does not require a special purpose vehicle (although a forfaiting fund could also purchase the accounts receivable).
- Like securitisation forfaiting pertains to the sale of account receivables generating a future stream of revenues over a longer period, whereas factoring is often single payment in the short term (cf. supra often no more than 90 days).

As we understand, securitisation is more relevant when requiring a refinancing solution for a large portfolio of small(er) standardised contracts providing cash streams over a longer period (e.g. mortgage or loan portfolio), whereas forfaiting is more adapted for larger contracts covering a long period with one counterpart/debtor (e.g. accounts receivable of one public authority, one school, one company). Although a forfaiting ‘facility’ may offer an additional intermediary solution between forfaiting and securitisation, where for example, a set of pre-agreed standardised conditions facilitate forfaiting solution in relation to a particular ESCO’s clients.

3.2.19 Domestic Offset Projects (meso/macro):

Domestic Offset Projects (DOP) pertain to emission reduction projects whose emission reductions are sold as compensation instruments. A well-known example thereof is the compensation of air flights by means of reforestation or emission reduction projects in developing countries.

DOPs create additional revenues, that may improve an investment’s return. In addition, the forward sale of part of the emission reductions can cover part of the investment’s pre-financing needs. In such a forward contract, the party selling the emission reductions will receive (part of) the agreed upon sales price at the signing of the contracts at the remainder at the delivery of the compensation instrument.

Currently, this solution is mainly relevant at the meso or macro niveau. However, once a

³ S. Kidney, D. Giuliani en B. Sonerud, “Stimulating private market development in green securitisation : the public sector agenda”, Climate Bonds Initiative, 2017. Available via https://www.climatebonds.net/files/files/-GreenSecuritization-EU_policy-paper_20_04_17-FINAL.pdf

general framework for DOP will be in place, it may also become relevant at a micro level. We note however that it may be challenging to claim emission reductions as the energy consumption reduction will generally go hand in hand with the emission reduction from an installation under the EU emission trading scheme (EU ETS). Hence, the latter may sell EU allowances to other companies under the EU ETS allowing these companies to emit more greenhouse gasses.

Note that the market for DOP is still in its infancy, so that the relevance of DOPs as a mainstream source of revenue in support of the energy efficiency financing is limited in the short-term.

3.2.20 Green investment scheme/domestic greening (Meso/macro)

Below we briefly outline the possibility of establishing a system of domestic greening (domestic greening by means of a Flemish / Belgian green investment scheme) of emission allowances purchased by Flemish or federal government to cover their emissions.

The idea of a Green investment scheme goes back to the early days of international emissions trading under the Kyoto Protocol (see box). The basic idea is that each time the government buys (cheap) emission rights abroad, it simultaneously commits a certain amount to a fund that will invest in projects that reduce greenhouse gas emissions.

Greening of emission rights

Many former 'eastern bloc' countries held emission rights (Assigned Amount Units or AAUs) in excess of their needs as a consequence of the economic downturn upon the transition from planned economies to free market economies at the start of the nineties. These countries could sell their surplus AAUs to other countries through International Emissions Trading. AAU trading with these countries was, however, regarded as politically sensitive. This relates to the fact that the 1990 emissions were used as the reference year for calculating the Assigned Amount and that therefore the many of the AAUs held in excess do not stem from additional emission reductions efforts, but merely result from the economic downturn mentioned above.

In order to make transactions on such AAUs more acceptable to the general public, some of the seller countries have implemented so-called 'Green Investment Scheme' (GIS). In essence, a GIS aims at 'greening' the AAUs sold by using the proceeds from the sale to finance emission reduction projects. These AAUs that are sold in this fashion are commonly referred to as 'green' AAUs.

A green AAU transaction combines⁴:

- International Emissions Trading (IET) in accordance with Article 17 of the KP, i.e. the sale and purchase of AAUs, and

⁴ De Brauw, Balcstone, Westbroek, GIS manual (Version 1.0) - Manual for the Sale and Purchase of Assigned Amount Units under a Green Investment Scheme, 16 March 2009, p

- The 'greening' of said AAUs in the Seller's country with the proceeds of the AAU sale. Unlike IET, the greening is not covered by an international convention or regulation but is merely the fact of an agreement between the seller and the buyer country (the so-called GIS agreement). The latter allows for substantial flexibility as the parties can agree on how the greening should take place.

Often these GIS have alternative investment windows, allowing to finance different types of emission reduction projects or programs (see [Figure 1](#) [Figure 4](#))⁵. For example, a 'hard greening' window could be reserved for investments in projects that have strict qualitative requirements (e.g. similar to joint implementation or clean development mechanism). A 'soft greening' window could be set up to finance projects for which it is more difficult to establish the precise amount of avoided emissions and therefore bear a higher degree of uncertainty. Another window could cover early or late crediting, whereby JI projects could receive (financial) compensation for emission reductions prior to 2008 (early) or after the end of the JI projects crediting period (late). Finally, financing of education and capacity building projects relating to climate change could be brought under a separate window. Based on the preferences of the buyer, the GIS agreement could limit the greening of AAUs to one or more of the available windows.

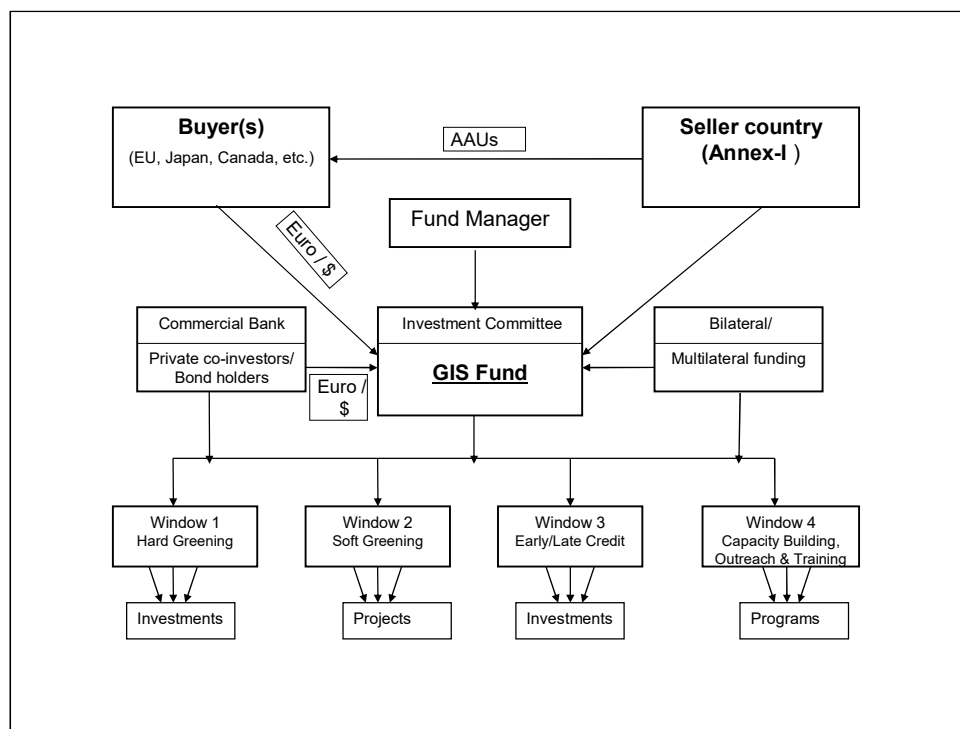


Figure 1- Generic structure of a Green Investment Scheme⁶

⁵ X, Options for designing a green investment scheme Report 29998, October 4, 2004, The World Bank, p.19 -23.

⁶ X, Options for designing a green investment scheme Report 29998, October 4, 2004, The World Bank, p19.

Note that the Annex B country could benefit from the domestic emission reductions financed through the GIS, insofar as these GHG emission reductions exceed the volume of AAUs sold.

As set out above in section [Error! Reference source not found.3-3-1-2](#), greening of AAUs via a GIS is operated through financing emission reduction projects or programs in the country of the seller with the proceeds of the sale of AAUs. In this case the carbon value will be captured by the owner of the project brought under the GIS and, possibly, by the Annex B party in which the GIS is located.

Under the assumption that green AAUs (i.e. AAUs which are greened through a GIS) command a higher price than plain AAUs (i.e. AAUs without the greening activities), the country buying the AAUs may have some room for capturing carbon value. Indeed, the greening of purchased AAUs could be performed through domestic projects in the country of the Buyer, financed by the price differential between the green AAUs and the plain AAUs. This would allow to generate an additional stream of revenues for investments in the Buyer's country.

Note that while the above illustrates domestic greening possibilities under the previous and current commitment period under the Kyoto Protocol, a similar greening approach could be organised to complement any type of emissions trading both between countries (within or outside the EU) and/or between private sector actors as well as between public and private sector actors.

3.2.21 Pay-for-performance (alternative investment) - (micro-large/meso)

A Pay-for-Performance (PfP) approach is mainly used in the context of innovative (first-of-kind) investments whereby a public authority transfers performance risk (risk of not achieving expected results) to a third party and the third party receives payment depending on result achieved. It can be used in the context of adaptation to finance and implement a set of water management measures such as green roofs, wadies, etc., as an alternative to investing in the adaptation of sewers network infrastructure.

Below we illustrate the main features of such a pay-for-performance approach taking the form of an Environmental Impact Bond. Note that this example provides only one of the many alternatives the allocation of risks and rewards to the participating parties.

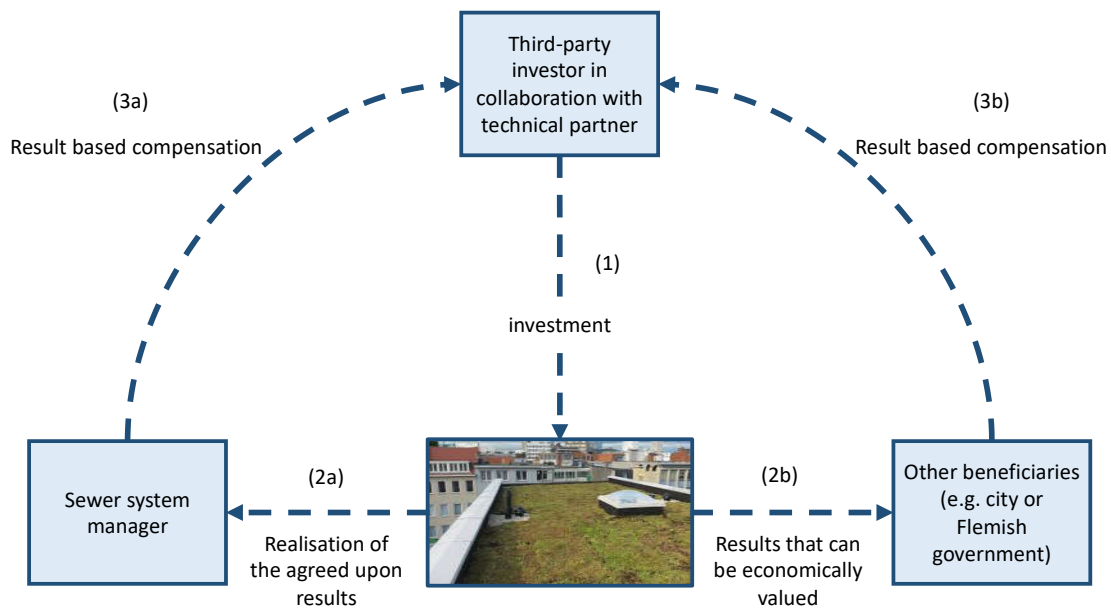


Figure 2 - example of pay for performance financing solution

Key business model features: A third party investor agrees with the sewer manager to invest in a program of measures aimed at reducing the (maximum) water flow rate during heavy rains, so that the sewer manager can reduce or avoid investments to his sewer infrastructure (= saving/avoided cost). Subject to the program of measures achieving the agreed upon result (for example, a predefined maximum water flow rate during heavy rains) the sewer manager is willing to compensate the third-party investor allowing the latter to recover his investment and earn a return on his investment commensurate with the risk taken. The performance risk of the programme of measures is allocated to the third-party investor. If the implemented measures do not achieve the agreed upon result (e.g. maximum water flow rate), the third-party investor receives no or only partial payment from the sewer manager.

Explaining the figure

(1) a third-party investor (financier) invests in a programme of measures that can reduce the maximum water flow rate during heavy rains (e.g. by supporting the green roofs, or additional above-ground water buffering capacity, etc.). The investor works with a technical bureau which implements the programme of measures.

(2a) if the agreed upon result is achieved (i.e. the implemented measures are effective), then (3a) the sewer manager pays the agreed upon remuneration. If the result is not achieved the sewer manager does not pay the third-party investor, or only part of the amount agreed in the case of success.

The same programme of measures can possibly generate additional co-benefits that can be economically valued (2b). For example, a green roof contributes to the adaptation- and mitigation goals of the local authority, or the biodiversity and greening goals of the Flemish government. It may be possible to capture part of the value created from its beneficiaries (3b) to finance part of the programme of measures.

For a real life example see: <http://www.goldmansachs.com/media-relations/press-releases/current/dc-water-environmental-impact-bond-fact-sheet.pdf>

3.2.22 Equity injection (micro-large/macro/meso)

An equity injection into an existing organisation can reduce the credit risk of that organisation. Note however that the equity will require a risk adjusted return. Possibly the party supplying equity may accept a lower financial return, if his investment allows him to secure co-benefits. These co-benefits may for example offer the investor an additional return in another form, e.g. a higher return from increased sales, or avoided costs to achieve policy goals.

Hereafter we use the term 'double dividend investors' to refer to investors that are willing to take into account co-benefits (indirect return) from their investment, when setting their return requirements to compensate their equity investment.

See also part on 'Equity funds'

3.2.23 Flexible loans (micro/meso)

Flexible loans can address cashflow problems, and to a lesser extent the return problem (if coupled to a performance guarantee).

Possibility to align the (monthly) instalments on the energy savings of the energy investment and/or the financial evolution in the position of the borrower.

Such Flexibility can be organised in different ways:

- Grace period: possibility to start re-imbusement after a certain period (which allows to build a buffer and avoid/reduce cashflow problems) or short suspension of monthly payments;
- Loan duration: the duration of the loan could be shortened or extended within certain limits, based on a decision of the borrower or taking into account the investments' performance in terms savings;
- Debtor: a higher flexibility in terms of duration can be coupled to a performance guarantee whereby under performance (within a certain margin) would require the guarantor to cover the interest associated with the extension of the loan period. Conversely if the investment outperforms, leading to a reduction in loan period the guarantor would receive (part of) the interest avoided. The latter creates an incentive to outperform. Note that in the event of a substantial underperformance part of the re-imbusement of the investment could also be lain with the performance guarantor.
- Drawdown option (Heropnamemogelijkheid): authorisation to drawdown of funds to agreed amounts to be used for additional energy renovation investments.

Such flexibility could be organised at individual project level or for a loan portfolio.

3.2.24 Loan with below market interest (form of concessional loans) – (micro/meso)

This is a loan where the lender receives a financial interest below market but gets compensated via other returns/economic benefits. For example:

- The allocation of a CO₂ reduction claim which can be monetized on the voluntary compensation market;
- Part of the rebate secure via bundling of purchasing power;
- Part of other economies of scale or scope;
- Economic return for renovation sector.

For more detailed information see the “guidebook on softloans” : http://www.energy-cities.eu/IMG/pdf/guidebook_softloans_web.pdf

3.2.25 Community Land Trust (meso)

The Community land trust. (CLT) can be used to free up own financial resources for energy renovation investments, thereby avoiding or reducing the need to finance investments via debt.

A CLT is a not-for-profit organisation that owns, develops and manages real estate, to the benefit of a local community. Ultimately the CLT is aimed at producing and managing real estate so as to make it accessible (housing) for low-income households. In addition, other functions (economic activities, services) can be operated on the CLT-properties, insofar as they benefit the local community. Below some key features of the FLC:

1. Not-for-profit, tax free/friendly legal form;
2. Dual property: land owned by the trust and buildings by the trustees;
3. Land leasing with the CLT as guarantor for the long term;
4. Continued access to cheap housing even after the homeowner sells the property;
5. Local shared governance: covering representatives of owners, the neighbourhood, and the participating (social)public body. Often the majority of the CLT directors will live in the neighbourhood.

To facilitate home-ownership for low income households the CLT provides buyers with a subsidy. The buyers have the same rights as other homeowners, except for the fact that they need live in the house themselves and if they sell, they need to reimburse the subsidy they received upon acquisition to the CLT. In addition, a (often large) part of the profit from the sale of the house will go to the CLT. The CLT has a pre-emption right (voorkooprecht) on the house. When the homeowner wants to sell his house, the CLT can buy it at market price and resell it. The new buyer receives the original subsidy plus a part from the profit secure upon the sale. This way the house remains financially accessible to low-income households, as the profit from the sale flows back to the community.

Domestic examples where you can find additional information can be found at:

- CLT Brussel <https://communitylandtrust.wordpress.com>
- CLT Gent : <http://cltgent.be>

3.2.26 Hybrid Housing market⁷

This solution reduces the cost of homeownership, thus leaving more financial room available for renovation. The main idea is that several participants set up a company that buys or builds a portfolio of houses of different characteristics (e.g. studios, apartments, small houses, large family houses), so that the participants become co-owner. Moreover, the participants rent a house from the company, and in their capacity of participant they

⁷ Source Igemo : <http://www.igemo.be/gemeenten/wonen/hybride-woningmarkt/wat-de-hybride-woningmarkt/>

indirectly benefit from profits made by the company.

This formula allows the participant to benefit from economies of scale similar to joint acquisition⁸ leveraging their bargaining power by buying or building 10, 50 or 100 houses. In addition, as housing needs over the participants' lifetime are likely to evolve, it allows to align variable participant needs on the available housing portfolio. For example, a young couple, moves from a studio to a larger apartment or home after the birth of their first child. Older couples leave their large family homes for a more comfortable flat when their adult children have left home. This alignment allows for efficiency improvements in the use of the available real estate portfolio. A cooperative company could offer an adequate company form to organize this kind of co-ownership of a real estate portfolio.

3.2.27 Debt Fund (meso/macro)

A debt fund pools financial resources (equity and debt) with a view to purchase/hold debt paper. The main aim of the debt fund is to preserve equity and generate an income. Debt funds can invest in other funds (sub-funds) to generate leverage. Pooling of investment resources can facilitate access to these resources.

3.2.28 Equity Fund (meso/macro)

An equity fund pools financial resources (mostly equity) with a view to purchase an equity share in projects or companies. The goal of an equity fund is to generate or increase stock value and/or secure dividends. Equity funds can, as is the case with debt funds, invest in other funds to generate leverage. Pooling of investment resources can facilitate access to these resources.

3.2.29 Pledge fund (micro – for large projects)

In this type of funds private investors commit to a certain investment volume but decide on a case by case basis in which of the proposed investments they are willing to invest. This differs from the standard equity or debt funds where the fund takes the investment decisions. This may for example be relevant for larger (infrastructure) investments. Furthermore, such pledge funds have been used in the context of the acquisition of project based carbon credits, where projects with different features were proposed to the participating private investors of the pledge fund.

3.2.30 Insurance (micro/meso)

Insurances can be used as de-risking instruments. Insurances transfer (part of) the risk that may hinder financing renovation to the insurer. For example, the Energy Efficiency Insurance of Munich Re⁹ covers on top of the value of

⁸ In Dutch “Samenaankoop” of “Groepsaankoop”

⁹https://www.munichre.com/site/hsb-eil-mobile/get/documents_E731043488/hsb/assets.hsb.eil/Documents/Knowledge-

the installation, the monetary value of the energy saving. Hence, said insurance allows an ESCO to cover part of the performance risk under an energy performance contract (EPC), and covers the client of the energy efficiency project against the risk arising from underperformance of his installation (and an ESCO's failure to provide compensation thereof).

3.2.31 Green Bond Plus (GOPlus) (meso/macro)¹⁰

A Green bond is a bond for which the investor receives the assurance (ex ante) that the collected financial means will be used to invest in projects or activities that are deemed 'green'. The bond establishes clear rules on what will be considered as "green investment projects".

The assurance of proper use follows from the commitment of the bond issuer, backed up by the implementation of an effective monitoring and penalty mechanism. A green bond is deemed a climate bond if its financial means are invested in projects and activities that benefit the fight against climate change.

Assuming that overall investors tend to invest based on the expected risk adjusted return, the certainty that the collected means will be used to foster green projects would only be secondary importance, and not decisive. Moreover, taking the above assumption, potential investors would only invest in a green bond if the risk adjusted return would be at close to the return of the best alternative investment option.

To increase the green bonds attractiveness, the bond could benefit from one of the other forms of government support. Such green bonds are referred to hereafter as GO^{plus}. Said support can take different forms such as:

- *Interest subsidy* – in this case the public authorities pay the bond issuer a subsidy, that the latter can transfer to the bond holders, in the form of a higher interest.
- *Subsidy of Bonds' issue price* - in this case the public authority subsidises the issuing price of the bonds so that the price paid by the investor is below the nominal value of the bond ('sub pari'). Hence, this allows for a higher return for the investor.
- *Return guarantee* – unlike the above-mentioned interest rate subsidy and issuing price subsidy, the return guarantee does not impact on the height of the return but provides certainty on achieving a predetermined return.
- *Capital guarantee* – in this case the public authority does not guarantee a certain return but instead guarantees at the expiration of the bond the reimbursement of the capital provided by the investors.
- *Obligation or incentive for (institutional) investors* – This may take the form of coupling existing (fiscal or other) advantages to an investment in Green bonds. For example, a pension fund or insurance company whose products benefit from a fiscal friendly treatment, could only maintain this

Center/Downloads/Document-Library/HSBEI-1225-1214-1-Energy-efficiency-Insurance-Product-overview.pdf

¹⁰ Zie voor nader informatie O. Van den Kerckhove, R. Adolphy, S. Van Den Bogaerde en Luc Wittebolle, "Internationaal vergelijkende analyse Economisch beleidsinstrumentarium gericht op vergroening van de economie", EWI, 2012, pg 155 ev.- https://emis.vito.be/sites/emis.vito.be/files/articles/2115/2013/Economisch_leleidsinstrumentarium_vergroening_economie_eindrapport_2012.pdf

advantage, if the pension fund/insurance company reinvest the money collected in Green Bonds nor similar financing instruments.

- *Quality label* – Apart from the risk-adjusted return as a key decision factor, the ‘green’ nature of a project may be considered as an additional factor influencing investment decisions (be it of a more secondary nature). A quality label can increase the trust in the Green nature of the investment proposition.
- *Subsidy for monitoring and control cost* – these costs are normally borne in by the issuer in view of providing reasonable assurance that financials means collected are invested in Green projects.
- *Indirect support measures* (via the increase of project returns) – These measures do not aim at reducing the financing cost have an investment project but focus on increasing the project returns so that these are able to cover the financing costs.

3.2.32 Crowdfunding (micro /meso)

Crowdfunding is a form of project financing by a large group of investors who each invest a rather small amount. There are many different ways to organise crowdfunding, notably in terms of investment focus, maximum investment, compensation, risk, financing instrument (equity, junior debt, senior debt), etc.

In Belgium the legal maximum to be collected via crowdfunding in one financial round is 300.000 euro. Larger amounts can be collected by accredited limited liability cooperative companies¹¹ that issue shares and companies that comply with the prospectus duty.

An accredited cooperative company can issue shares up to a maximum of 5 million euro per crowdfunding project, with a maximum investment of 5.000 euro per candidate investor per crowdfunding project.

Crowdfunding can be used to facilitate securing a traditional commercial (bank) loan, e.g. when it is used to cover the ‘first loss’ tranche of a larger loan portfolio.

Examples of crowdfunding platforms active in Belgium:

- Hello Bank crowd : <https://crowd.hellobank.be/nl/projects/list>
- Crofun : <https://www.crofun.be/nl/>
- So crowd : <https://www.socrowd.be>
- Bolero : <https://bolero-crowdfunding.be/nl>

3.2.33 Crowdsourcing (meso/macro)

Crowdsourcing sensu stricto¹² is somewhat peripheral to the financing question as it focuses on reducing personnel cost (and hence the need for financing), speeding up innovation, etc. The idea here is that not the financing is sourced but rather the labour / brainpower of a large group of people, often in parallel processes going from micro-tasks such as reCAPTCHA¹³, to more complex tasks such as Wikipedia.

¹¹ In Dutch : coöperatieve vennootschap met beperkte aansprakelijkheid (cvba)

¹² Crowdsourcing encompasses crowdfunding

¹³ CAPTCHA stands for "completely automated public Turingtest to tell computers and humans apart" and is used to determine whether the user is a human or not. reCAPTCHA combines this test with the digitalisation of books.

It may be relevant to consider whether some Energy renovation tasks/activities (insulation, painting, etc.) or some of the ancillary tasks activities the energy renovation process (information, coaching, monitoring & control, etc.), could be organized using a crowdsourcing format.

The development of a “Renovationadvisor” by analogy to the well-known “Tripadvisor” could reduce the information cost associated with finding a good and trustworthy renovation contractor. Some initiatives come close to this idea, for example www.twizzi.be.

In some cases, crowdsourcing activities could receive a financial reward, that could be used to further develop and support energy renovation investments.

3.2.34 Grouped purchase (meso)

Grouped purchases can reduce the cost of energy renovation (and/or provide revenues for the join group purchase organizer) by bundling the group’s participants purchasing power. The extent of the savings/income that the supplier is willing to concede is dependent on the benefits that are expected to accrue to him (a.o. increased turnover, improved utilization rate, and economies of scale and scope), and that will ultimately improve his bottom-line.

The economic value of the net rebate (i.e. after subtracting transaction costs) can be entirely channelled to the renovators participating to the grouped purchase or could in part accrue to a third-party service provider, e.g. an organization that will coach the renovators during their renovation journey.

Instead of the suppliers’ rebate/commission, which is definitely lost for the latter, other counterparts are conceivable. For example, the counterpart could be an investment in a fund (equity or debt), accepting a below market return. The level of contribution by the supplier can be adapted so as to economic higher amount contributed in the fund compensates for a more limited but definitively lost contribution/rebate or commission. A periodic refinancing of portfolio of outstanding loans would allow to further increase the leverage of this solution. See for additional information: “draaiboek financiering lokale klimaatplannen”¹⁴.

3.2.35 Membership Card System – (meso/macro)

The functioning of an MCS can be summarised as follows: (1) a member organisation agrees with (2) suppliers of products and services that its (3) members receive a reduction on the normal price and / or that the member organisation of the suppliers in question

¹⁴ S. Bogaert, P. Dresselaers, A. Gommers en L. Wittebolle, “Draaiboek financiering lokale klimaatplannen”, eindverslag in het kader van het Lerend Netwerk Financiering Lokale Klimaatplannen in opdracht van LNE 2015, deel II p. 26 e.v.
<https://www.lne.be/sites/default/files/atoms/files/Draaiboek%20Financiering%20lokale%20klimaatplannen.pdf>

receive a fixed or variable contribution depending on the purchases of its members from these suppliers.

This is a way of generating savings on renovation costs and / or an additional income stream by bundling of purchasing power. This is a variant of a grouped purchasing schemes, which also use the bundling of purchasing power to increase their bargaining power with suppliers. However, in the case of the MCS the bargaining power is not linked to a purchase at a particular point in time, nor is object of the purchase standardised (as is often the case with grouped purchases). Hence, the MCS offers greater flexibility than a grouped purchase approach.

Well-known examples of this purchasing power bundling technique are: the benefits that book clubs, or credit card companies, negotiate for their members. For the affiliated suppliers, the advantage lies in the fact that the supplier is mentioned on a list of affiliated suppliers, can generate an additional turnover, and that the contribution to the member / member organization is made in function of the purchases made. Here too, there are a number of possible variants (e.g., modulation of contribution in function of a certain volume).

Remark: a deliverable 2.2 includes a more detailed description of the MCS as a possible overarching solution in support of the different financing solutions developed during the Falco project.

3.2.36 Joint incentive (↔ split incentives) (meso/macro)

Whilst the split incentive dilemma has been rather well researched, there's a case to consider its opposite in terms of a *joint* incentive. The split incentive problem pertains to the fact that the investment effort from one party mainly benefits another party. This discourages (marge) investments. Instead a we can consider a joint incentive when the investment effort benefits to both the investor as to a third party (converging co-benefits).

For example, a South African Insurance company, provides incentives to healthy behaviour from its customers¹⁵. The insurer partners with several suppliers of healthy consumer goods and services such as supermarkets, fitness centres, etc... with whom the insurer negotiates a rebate for his clients for healthy activities and goods purchased by these customers. In return for this rebate the insurer advertises the healthy products and services of these partner suppliers and may even provide a financial contribution (taking account saved insurance pay-outs).

The central idea behind this approach is to bring about a win-win situation for both the insured customer, and the insurer whereby the insured clients live healthier lives, the insurance company can reduce its pay-outs for example in hospitalisation and health insurance. In addition, this approach also impacts on customer retention and loyalty. It offers a way to achieve competitive advantage through a product differentiation strategy in a market which is mainly competing on price. Interesting to note here is that the third-party beneficiary took the initiative.

¹⁵ See Discovery's 'Vitality' programme: <https://www.discovery.co.za/portal/individual/vitality-home> en <http://www.vitalitygameon.com/vitalitygameon/>

As with the split incentive third party beneficiary of a joint incentive benefits from the investment. But here the investor benefits also from the investment, so that the third party beneficiary only needs to nudge the investor into the investment.

Similar joint incentives can be found in other domains. For example, tooth paste producers has an interest in supporting public authorities' campaigns promoting correct tooth hygiene. The more teeth are brushed, the more the tooth paste producers sells.

Energy analogy: Mutatis mutandis a similar approach could be adopted for energy and climate related investments. For example, energy renovation investments can reduce energy poverty and bring health benefits which will save social security expenses (health insurance). The same investment can avoid or reduce (pre)financing and recovery costs for o.a. OCMW, and utilities suppliers as a consequence of the lowering of the energy bills¹⁶. Finally, both public and private companies (notably those active in the renovation industry) will either benefit from savings (avoided costs) or additional revenues via the energy renovation investments. If the beneficiaries of the energy investments are willing to contribute of these investments, then the probability increases that the investments will indeed take place. This could take the form of a contribution (pay for performance), whereby a part of the avoided costs/additional revenues would flow back to the party making the energy renovation investment.

3.2.37 Green Flexible Reward (meso/macro)

This solution focuses on the flexibilization of the salary package as a means to induce additional energy investments. More specifically, a green flexible reward allows employees to choose – hence, on a voluntary basis – for an energy renovation of their homes as a part of their remuneration instead of a company car. Green flexible reward can cover many variations, notably in terms of authorised investments, but the core elements are always: a salary cost advantage granted to the employer for part of the employees' salary package dedicated to investments in energy efficiency or renewable energy.

Such flexibilization is likely to require a modification of the tax legislation with regard to 'benefits in kind' (which is of the jurisdiction of the federal government). Furthermore, for some aspects/in some variations the cooperation with regional authorities may be required, given the regional competence with regard to energy and housing policy.

Note that the current legislation may offer already sufficient room to introduce some (more limited) form of Green flexible reward. This point requires further investigation.

A system of green flexible reward is expected to yield the following benefits:

¹⁶ Zie terzake Platform tegen energearmoede, "De energieprestaties van sociale woningen in België verbeteren: kosten-baten analyse en aanbevelingen, Koning Boudewijnstichting, 2018, beschikbaar via <https://www.kbs-frb.be/nl/Activities/Publications/2018/20180219NT1>

- Contribution to the realisation of energy and climate goals without requiring additional budget (the emission reduction equals the emissions avoided as a consequence of reduced car usage and the emission reductions stemming from the energy renovation and/or investments in renewable energy employee;
- Additional employment in the renovation and building sector which leads to additional tax revenues and reduced social security costs for the public authority;
- A reduction of the grey economy in the building and construction sector;
- Reduction of societal costs new tuning inefficient car use (less congestion and related problems);
- The employee/ a home owner receives economy proof increase of his purchasing power;
- The possibility to extend it access to these benefits to employees with lower salary scales by providing the possibility to accumulate energy renovation (postponed loan), and use those for energy renovation investments once he has accumulated a sufficient sum;
- Employers continue to enjoy the cost advantage (previously) associated with a company car. Moreover said advantage could even be increased without additional burden to public budgets giving the additional tax revenues and reduce social security costs that Will be associated with(See above):
- ...

In addition, as the fiscal treatment of the company cars remains unchanged, as it only provides a voluntary alternative, the Green Flexible Reward could fit within the federal government agreement, and simultaneously address overconsumption of company cars and slow energy renovation investment rates.

4 Development of adequate solutions

4.1 Overview

Table 1 provides a summary overview of the solutions described above. In addition, we provide a first estimation of the relevance of each of these solution for addressing the main barriers and depending on the ambition levels.

We use a scoring scale ranging from ‘0’ if the solution is not relevant to ‘+++’ if the solution is highly relevant, with ‘+’ and ‘++’, to indicate limited and moderate relevance.

As the scoring provided is merely a first general estimation, a separate analysis should be performed for each particular case.

Table 1 - Overview of expected relevance of each solution in relation to identified barriers

micro	meso	macro	Financing solution	Ambition level			Return deemed insufficient			Cashflow problem			creditworthiness is insufficient			Status quo of credit position/lending capacity			Economic lock-in			Financing project development costs		
				L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
				x	x	x	1 Aggregation/Bundling	+++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
x			2 Intrafing – contracting	+	++	+++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
x	x		3 Climate plan benefit contribution	0	+	++	0	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	x		4 Deferment of payment of revenues from sale of EUA to industry	0	0	0	++	++	++	++	++	++	+	++	+++	0	+	+	+	+	+	+	+	
x	x	x	5 Guarantee – Credit risk	+	++	+++	0	0	0	+	++	++	0	0	0	0	0	0	0	0	0	0	0	
x	x		6 Performance guarantee – performance risk	+	++	+++	+	+	+	+	+	+	0	0	0	0	0	0	0	0	+	+	+	
x	x		7 Third party financing	0	0	0	+	+	+	0	0	0	+	++	++	+	+	+	+	+	+	+	+	
0	x	x	8 Retention of subsidies	0	0	0	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x	x	x	9 Credit Default Swap	0	0	+	0	0	0	0	+	++	0	0	0	0	0	0	0	0	0	0	0	
x	x		10 Optimisation of use of real estate	+++	+++	+++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	
x	x	x	11 Compensation mechanism (flexibility mechanism)	++	++	++	0	0	0	0	0	0	+	+	+	+	+	+	+	+	+	0	0	
x	x		12 Sale & lease back	0	0	0	++	++	++	++	++	++	+	+	+	++	++	++	++	++	++	++	++	
x	x	x	13 Usufruct & lease back	0	0	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x	x	x	14 PACE (Property Assessed Clean Energy)	0	0	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x	x	x	15 On-bill financing	0	0	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x			16 Factoring	0	0	0	+	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0		
x	x	x	17 Securitisation	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x			18 Forfeiting	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x	x		19 Domestic offset projects	+	+	+	+	+	+	0	0	0	0	0	0	0	0	0	0	0	+	+	+	
x	x		20 Green investment scheme/domestic greening	+	+	+	+	+	+	0	0	0	0	0	0	0	0	0	0	0	+	+	+	
x	x	x	21 Pay-for-performance (alternative investment)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
x	x		22 Equity injection	0	0	0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
x			23 Flexible loans	0	0	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
x			24 Loan with below market interest (form of concessional loans)	+++	+++	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
x	x		25 Community Land Trust	0	0	0	0	0	0	+++	++	++	+++	++	++	++	+	++	++	++	++	++	++	
x			26 Hybrid Housing market	0	+	++	0	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+		
x	x		27 Debt Fund	0	0	0	+	+	+	0	0	0	++	++	++	+	+	+	+	+	0	0		
x	x		28 Equity Fund	0	0	0	+	+	+	0	0	0	++	++	++	+	+	+	+	+	0	0		
x	x		29 Pledge funds	0	0	0	+	+	+	0	0	0	++	++	++	+	+	+	+	+	0	0		
x	x		30 Insurance	+	+	+	+	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
x	x	x	31 Green Bond (Plus)	0	0	0	+	+	+	0	0	0	+	++	++	++	+	++	++	++	++	++	++	
x	x		32 Crowdfunding	+	+	+	0	0	0	0	0	+	+	+	+	+	+	+	+	+	+	+	+	
x	x		33 Crowdsourcing	+	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+	+	
x			34 Grouped purchase	+++	+++	++	+	+	+	0	0	0	0	0	0	0	+	+	+	+	+	+		
x	x	x	35 Membership Card System	+++	+++	++	+	+	+	0	0	0	0	0	0	0	+	+	+	+	+	+	+	
x	x		36 Joint incentive	++	++	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+	+	
x	x	x	37 Green Flexible Reward	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	

This table will be updated with the additional solutions that will be identified during the remainder of the FALCO project.

4.2 High ambition level as ultimate reference point

It is paramount to adopt a high ambition as the central reference point when developing the financing solution for each of the break through projects. This does not mean that the solution needs to adopt investments that will deliver that high ambition immediately. What it does mean is that the developed solutions need to indicate how they will achieve this high ambition and, that short term solution that satisfy lower ambitions need to contribute to

achieving the higher ambitions.

4.3 Root-cause analysis (in concreto)

The barriers and solutions described above have been generically defined and only constitute a support to allow systematic analysis of each of the breakthrough projects. It remains ESSENTIAL to define the barriers and solutions applying to each breakthrough project and, more general, investment project.

More in particular, is it paramount to perform and document for each of the breakthrough projects a root-cause analysis for each of the barriers identified. This approach allows to better understand the logic and underlying assumptions. This in turn, allows to seek validation of said logic and assumptions with third parties (this is notably relevant in the context of the due diligence), and allows timely correction of the solution should it appear that certain assumptions are counterfactual.

When performing the root-cause analysis, one should try to trace back the causal chain as far as possible. By shedding light on the different links of the causal chain, we can then identify on which link(s) we should concentrate our intervention.

Guiding questions for this root-cause analysis:

- Is it a real barrier, or can we circumvent it?
- What is causing this barrier? Go back to the source, the real causes of the barriers identified.
- Who can intervene on the different links?

ATTENTION : to use your time efficiently it is important to distinguish between :

- a) On the one hand, the investment barriers that point to financial barriers preventing potential investors to invest in energy renovation (hereafter '*primary barriers*'), such as a low return of the energy renovation investment;
- b) On the other hand, barriers with regard to certain (ideas for) solutions (hereafter '*secondary barriers*'), such the limited value of a performance guarantee provided by an ESCO with insufficient equity to back-up said guarantee.

The first focus should be on the primary barriers. Secondary barriers should only be further investigated for preferred (combinations of) solutions.

5 Developing solutions: adopt a fresh perspective

We need to take the time to look at the financing questions anew! Not all aspects of the solution need to be implemented at once. Some elements of the proposed financing solution may be implemented at a later stage. If we limit ourselves to what is possible in the current context then we will never be able to deliver on ambitious goals.

Example of adopting a fresh perspective: instead of looking only at the benefits delivered to the investor it may be relevant to look at (co-)benefits that accrue to third party beneficiaries and try to capture part of the value created with this third-party to help financing the investment. Adopting this perspective means that we need to address a series of additional question such as :

- Who benefits from the energy renovation (on top of the homeowner/landlord or the tenant)?
- What is the form (avoided expenses; additional income, a more beautiful sight, higher comfort, less risk, ...)?
- Is the benefit easily economically quantifiable?

See for instance a recent report issued by the Koning Boudewijnstichting quantifying societal benefits of energy renovation investments in social housing¹⁷.

5.1 Combining solutions and implementation planning (phasing)

The development of financing solutions for the different breakthrough projects is likely to require a combination of several (partial) solutions described in the matrix. This is especially the case for solutions designed to achieve the higher ambition levels. As this combination of solutions may need to be phased in time, it may be relevant to adopt a modular approach when designing and planning for implementation of newly complex financing solutions.

For an example see Figure 3, that provides a schematic representation of the combination of the following partial solutions into one coherent financial solution :

- Incorporation and first equity round for debt fund (e.g. partially EU and/or Flemish Government and partially private institutional investors and industry actors from the renovation market). If there are more debt funds that are active in different investment domains (e.g. one for SMEs and one for the renovation of private houses) than it is possible to work with an overarching debt fund - see (1*) – allowing to attract investors that want to diversify their investments,
- The pooled resources can be transformed in loans that are preferably highly standardized (e.g. as would be the case for ER 2.0) so as to build a large standardized portfolio of loans;
- Once the portfolio has a sufficient volume – and this may take some time - (e.g. > 100MEUR) the portfolio can be securitized with a view to refinance the portfolio;
- The cash flows generated by the securitization will allow building a new portfolio of standardized loans, which after a while will be again securitized.

¹⁷ <https://www.kbs-frb.be/nl/Activities/Publications/2018/20180219NT1>

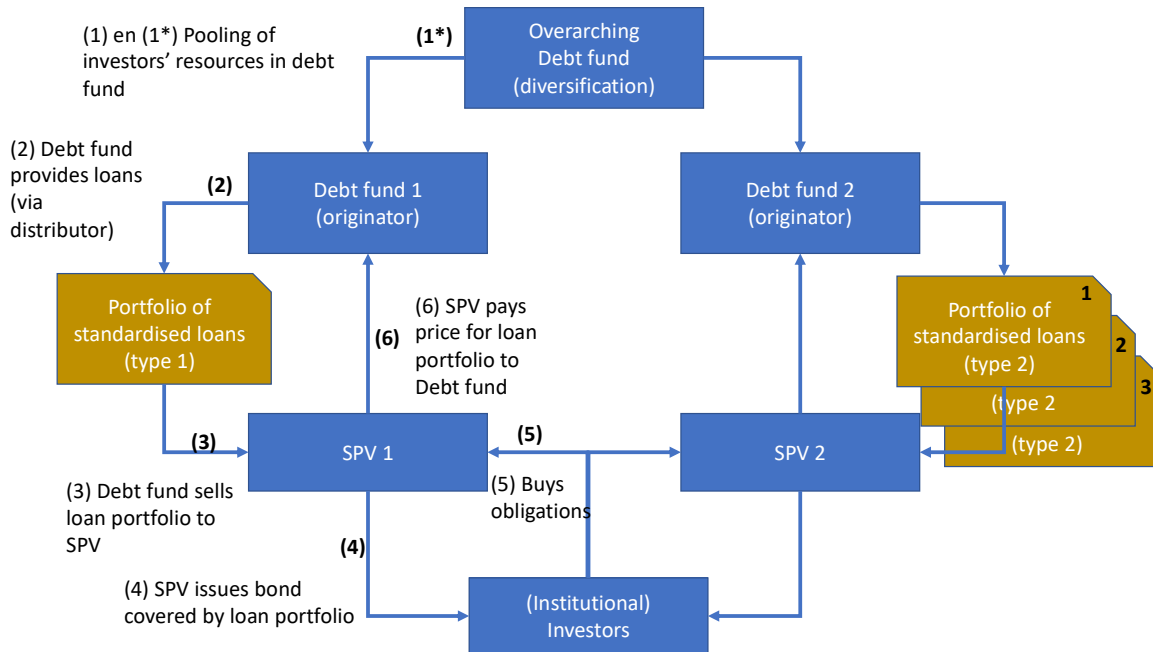


Figure 3 - Example of a combination of partial solutions into one financing solution

For an additional example, of the combination of solutions for the matrix, have a look at the ER 2.0 solution that combines three main solutions:

- A debt fund which provides loans via the energy houses;
- A refinancing solution (securitization of covered notes) that will increase the leverage (in terms of environmental and economic results) of debt funds financial means and thereby allow to attract double dividend investors;
- The membership card system to secure additional revenues which can notably used to finance the much needed technical and administrative support of the renovators.

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