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D3.6.1

WP3 - WG4 Financial Pilot Activity Report. Operative schemes

Final Version

SHERPA

SHared knowledge for Energy Renovation in buildings by Public Administrations.

Priority axis-Investment Priority-Specific Objective 2-1-1

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1 Specific objectives

The project SHERPA WP3 - WG4 aims to raise awareness about financial issues on the ERB projects promotion and development.

The main scope of it is too explicit the financial analysis of ERB projects, identify financing alternatives for ERB projects and try to innovate on the financial schemes identifies according the specific characteristics of ERB projects.

Therefore, the main goals that were agreed for the WG4 were:

1. To identify and agree the financial process to be made in order to allow EEB projects getting financed
2. Identify the best financial solution to renovate 100 buildings selected by all SHERPA partner regions

And, once the Financial process was clear and the current funding alternatives were analysed, the main goal of the WG4 was to apply the financial process and the funding alternatives in specific ERB projects.

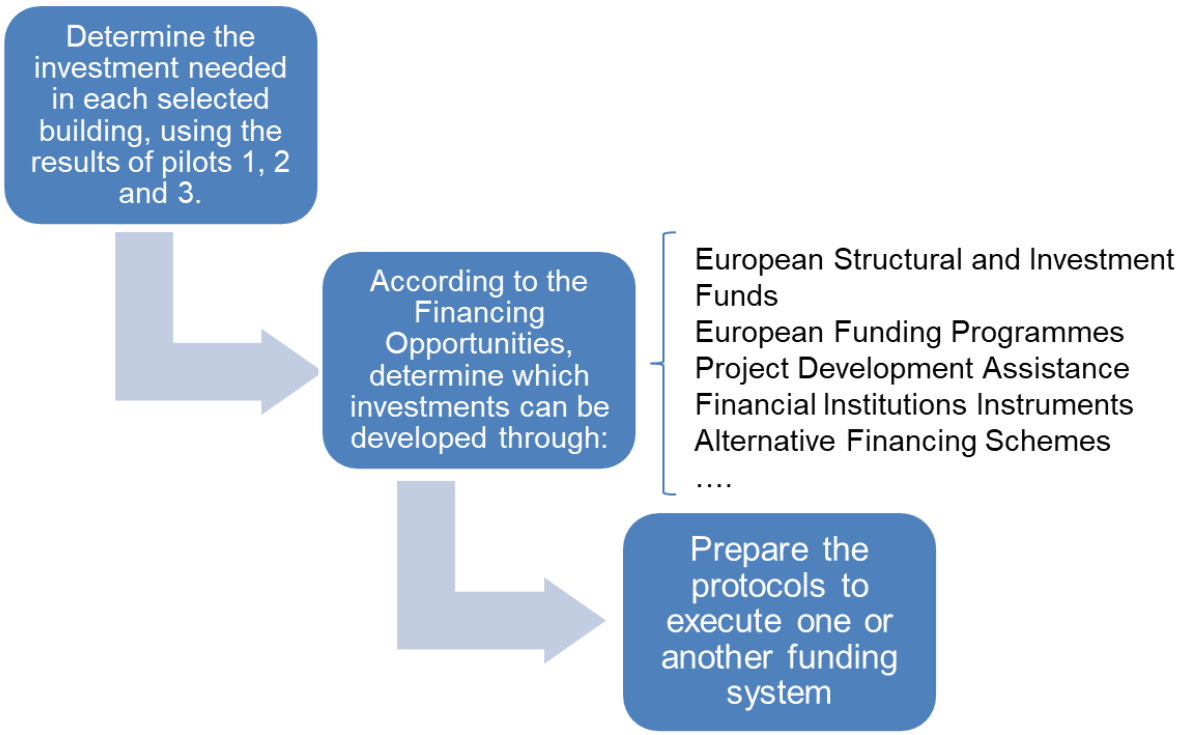

Figure 1. Methodology

This methodology was designed in order to be applicable to other administration levels and it was the result of other previous processes of technical analysis done on other projects.

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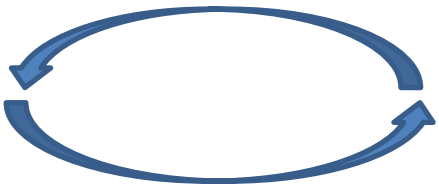
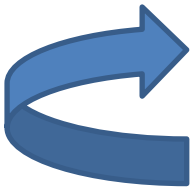
1) The overall approach used in the WG is the integration between regional and local level:

REGIONAL  **LOCAL**

2) The Financial Model Working Group will receive inputs from the previous Sherpa activities in the WG3:



BUILDING SELECTION DATA SYSTEM AWARENESS

AND

TRAINING FINANCIAL MODEL

In order to develop and facilitate all the WG4: FINANCIAL ANALYSYS of ERB projects and match of the ERB projects with Funding alternatives it was developed the:

SHERPA FUNDING TOOL

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2 Methodology

2.1 Structure - Financial schemes

The WG4 was structured in an attempt to maximize participation and inclusion of all partners. To do so the SHERPA FUNDING TOOL was created in order to make very practical the application of the financial process methodology and the funding feasibility analysis using real examples of ERB projects.

2.2 Financial process

The SHERPA FUNDING TOOL summarizes the Financial process in four main steps:

- **Project Assessment:** analyses whether the project is mature and complete to check the real potential in terms of savings and investment return.
- **Promoter Assessment**: an in-depth analysis of the promoter of the project in order to understand if the promoter itself has the enough experience in order to face the project.
- **Credit Assessment**: if the promoter or a third part creditor is able to pay its financial obligations. This section aims to understand who is the payer of last resort and what are its financial capabilities.
- **Return Assessment**: assessment of the project from a pure economic return, using the IRR method.

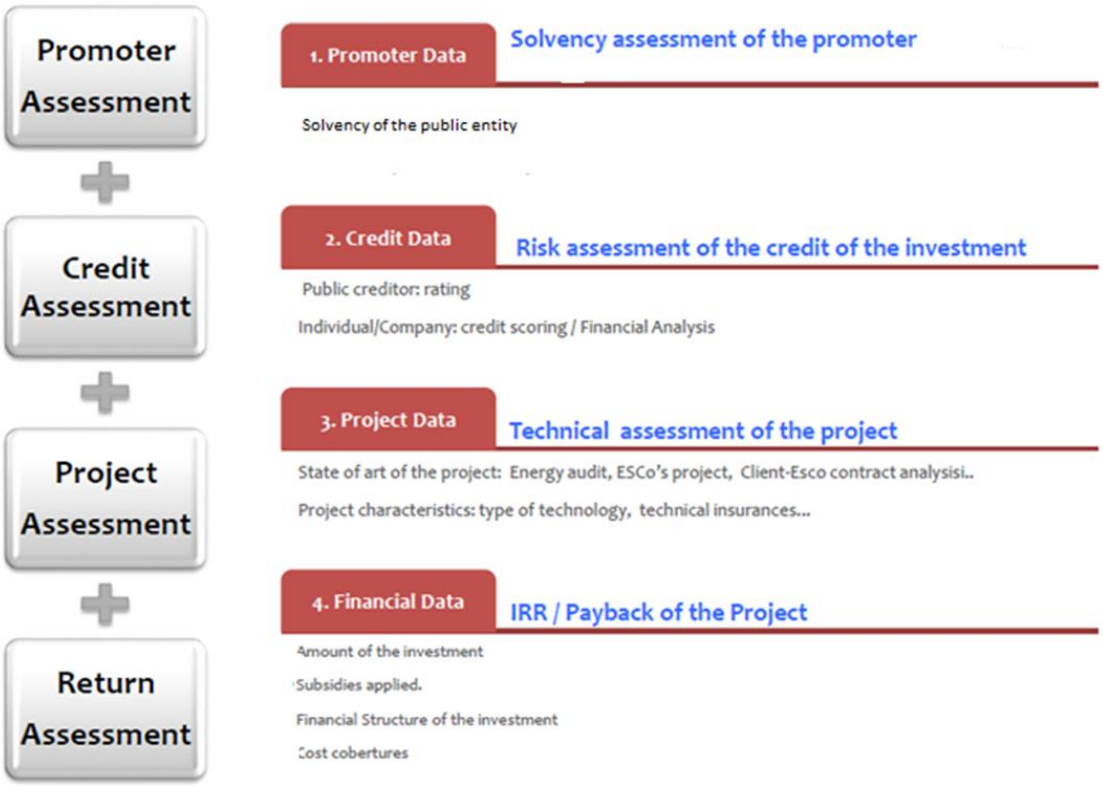

Figure 2. Financial process

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The result of these four sections will tell the ERB promoter/manager whether or not the project will face funding difficulties. In case some difficulties will be found, some extra work is needed in order to establish which of the parts of the ERB project need to be worked on in order to fix the problem, or which kind of innovation on the funding alternatives should be done to adapt to the ERB features.

2.3 Funding Feasibility

One of the most challenging parts in every project is to find some entity willing to finance it.

So, the SHERPA FUNDING TOOL second part aims to connect the funding alternatives and match these financing alternatives with the financial characterization of every project.

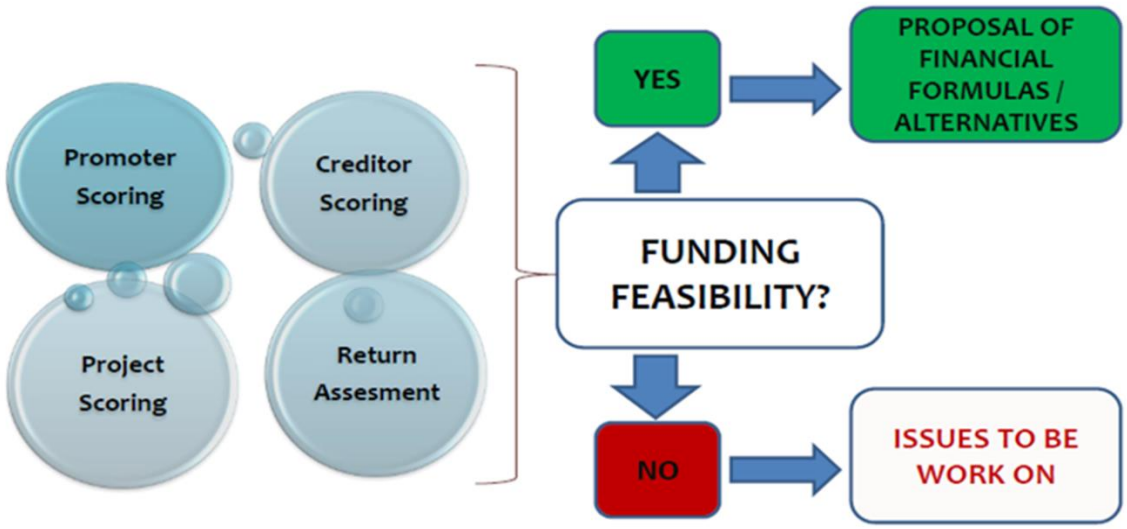

Figure 3. Funding Feasibility Scheme

Some financing alternatives were presented on the WG4 to analyse its suitability in every partners region:

- **PRIVATE EQUITY** = private investors who invest money as equity (no loan) in order to get back part of the income to repay the investment and get a profit from the operation;
- **TRADITIONAL BANK LOAN** = the possibility to get a loan on which interest and the amount of the loan itself will be paid back;
- **ETHIC BANKING** = it is a kind of bank who accept less interests on a loan in order to promote projects that have a positive impact for the society. In this category there are even the investment regarding energy savings or renewable energy production;
- **COOPERATIVE FINANCING** = cooperative financing is similar for certain aspects to the ethic banking. A cooperative would finance the project at a lower interest than it usual would get financed; the goal is not get back a profit but to respect the environment and guarantee, for instance, more job opportunities in the area and a better quality

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development; also, a cooperative requires the entity/private to be associated with it in order to do business together;

- **CROWD FUNDING** = it is part of a new way to finance projects. The promoter of the project will ask on a crowndfunding platform for investors who will finance a project to get a return (for instance in certain cases a unit of the product financed) and to finance a project that has a high social return;
- **CROWD LENDING** = it works on online platform like crowndfunding. In this case the promoter is asking for a loan but online to a multitude of small investors instead of going to a bank. This is usually done in case the project can't get financed by a traditional bank;
- **EQUITY CROWNDUNFING** = the promoter of the project will ask on a crowndfunding platform for investors who will buy a share of the project and act like a private equity providing money in exchange of a part of the profit.

In addition, a financial template was created, with the aim of understanding the specificity of the funding alternatives in every region.

The following table aims to understand how the financial actors behave in different countries, as this could facilitate or make it harder in certain cases to finance a given project.

The regions partners were asked to fill this table according with their local situation.

			Private Equity	Traditional bank loan	Ethical banking	Cooperative financing	Crowd funding	Crowd lending	Equity Crowd funding
PROMOTER									
	PUBLIC		NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES
PROJECT									
	ACTIVE MEASURES		NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES
	PASSIVE MEASURES		NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES
	RENEWABLES		NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES	NO/YES
PAY BACK PERIOD			X years	X years	X years	X years	X years	X years	X years
INTEREST / IRR			X %	X %	X %	X %	X %	X %	X %
WARRANTIES									
	KIND OF WARR.		PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL
TOTAL INVESTED AMOUNT			HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW

Table 1. Financial Actors

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A step by step guide and an example in order to facilitate the filling of the table were provided:

- **PROMOTER** = it is whom is developing the project;
- **PROJECT** = could be classify into 3 main points. Active measures, passives and renewables. There is an active measure when the investment is focused on replacing an energy consumption source (light, air conditioner…) with a more efficient one. There is a passive measure every time there is an attempt to lower the energy consumption through an indirect intervention (for instance, in case of a building gets its facade retrofitted in order to dissipate less energy). Renewables, as last point, just means that the project includes a part in which the generation of energy through Solar Panel or other sustainable forms is implemented; another difference among active and passive measures is that while active measures can be ''removed'' in a second time passive ones cannot be as they become part of the building/structure itself;
- **PAY BACK PERIOD** = once an investment is done, it should be able to provide money in return. Calculate the pay back is fundamental in order to understand in how many years the project should be able to repay itself. In order to do this we get the initial investment, we subtract the first year income from the project, then the second one until we get 0 as a result. Once we have done it (of course it is very simple if we are expecting the same income or saves every year) we just have to see how many years it took theoretically for the investment to repay itself. This calculation should include as a cost the interest eventually paid to financial or public institutions;
- **INTEREST** = it is the rate of interest that the specific selected model requires; Interest or IRR (in alternative) are always requested by which is financing a project;
- **IRR (INTERNAL RATE OR RETURN)** = this is a rate, very used in finance, who represents the average percentage of return an investor got thanks to an investment. It is very important in order to understand if the investment is profitable and at which rate (for example, to compare it with the interest rate the bank is asking to finance the project). To calculate this rate it is very easy thanks to excel. It is just important to put in a cell the initial investment required with a – (negative) before the number. Then, under that specific cell it is required to insert all the income we will get year by year (1 year per cell starting with the first year). After done this, it is just needed to insert the formula in another empty cell. The formula will be '' = IRR(h12:h18)* '' and we will get an IRR that is very close to the right one. *(here we just point tout all the cells);
- **WARRANTIES** = a personal warranty gives more power to the creditors and because of this the entity who will accept to concede this kind of guarantee will probably get rewarded with less interests. On the other side, a real guarantee is connected just with the investment itself. If, for any reason the investment won't be able to repay the loan there would be no personal inclusion;

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- **TOTAL INVESTED AMOUNT** = the total invested amount is the maximum investment that the specific form of investment can support. There are 3 options. Low invested amount is when there are at most 99.999 euro for invest in the project through that specific method. Medium invested amount is between 100.000 and 499.999 euro while high invested amount is above 500.000 euro of potential investment. Even if, in some cases (like crowd funding) there is the theoretical possibility to receive more than 500.000 euro the result in the table should be related to real situations and because of this, if it's really unlikely to get high amount of money through that channel it should be written Low or Medium in the cell.

2.4 Example of using Funding Tool

Below shows the results of one example (see the Figure 4) integrated on the FUNDING TOOL.

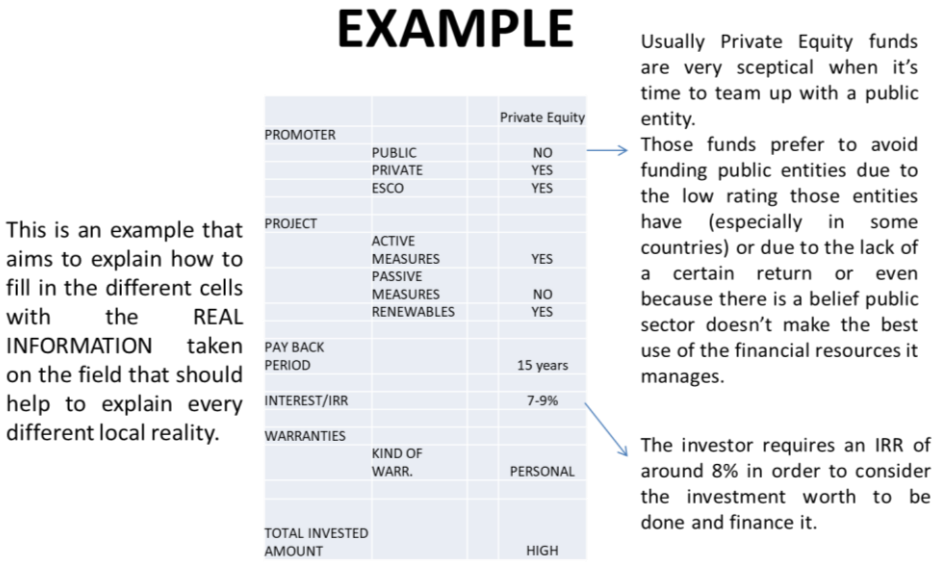

Figure 4. Example of the using Funding Tool

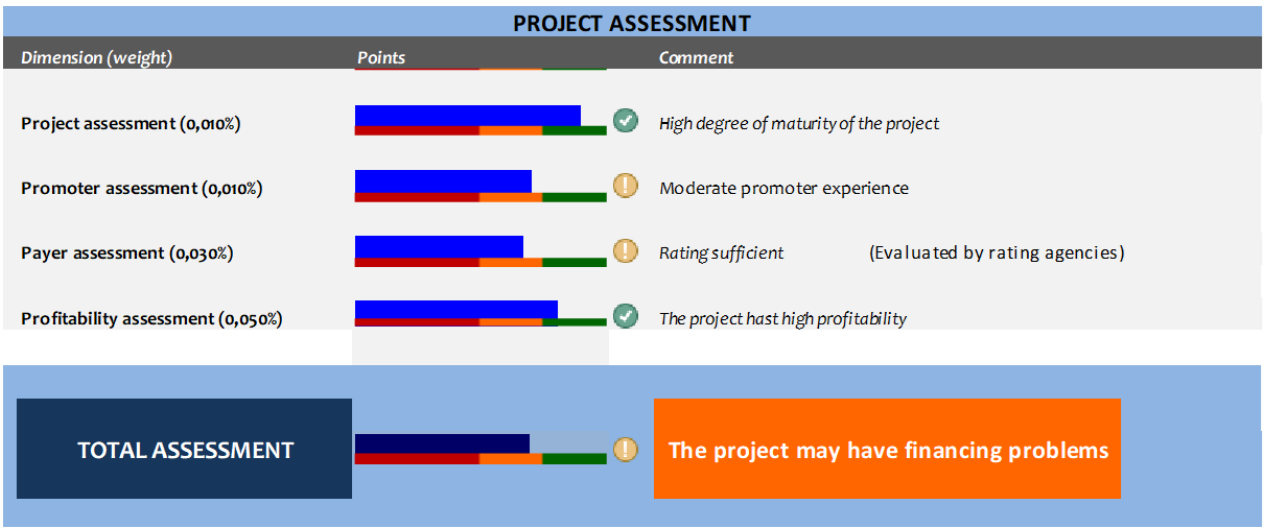

Figure 5. Example of Project Assessment – PART 1

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FINANCING SOURCES AVAILABLE FOR THE PROJECT	
CAPITAL RISK	OK
TRADITIONAL BANK FINANCING	OK
ETHICAL BANK FINANCING	OK
COOPERATIVE FINANCING	Not Applicable
EQUITY / CROWDLENDING	Not Applicable

Figure 6.Example of Founding Feasibility – PART 2

And also indicate which should be the minimum amount of public support to make a project feasible in case is not:

GRANTS NEEDED TO GET A MINIMUM 5% IRR	
Public financing (grants)	**0.00%**
Minimum IRR to be achieved	5.00%
Public grants needed	-€ 262,615
ALERT! There may be some problems in solvency or experience of payer/promoter	

Figure 7. Example of Minimum amount

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3 Development of the work

The following is descriptions of the nine meetings being held over the time the whole duration of the project (from December 2016 to July 2018). All of them, as such online as live meeting, have being exchanged information on a monthly basis.

The below table shows summarize of the total done meetings in the WG4 Financial.

Date	TYPE OF MEETING	Attendees
Face-to-face meeting		
16/12/2016	1st. SC in BARCELONA	32
14/06/2017	2rd. SC in ROME	11
21/11/2017	3rd. SC in CRETE	38
20/04/2018	4th. SC in ROME	30
18/07/2018	5th. SC in MARSELLA	28
Teleconference meetings		
07/02/2017	1st. TELCO	11
19/04/2017	2nd. TELCO	16
26/09/2017	3rd. TELCO	10
28/02/2018	4th. TELCO	13

Table 2. Meetings held

Below is describing and giving relevant information about of the meetings classified by face-to-face and teleconference. The basic information provided will be date, numbers of attendees, the discussed topics in each meetings focus on this WG4 Financial and the final conclusions and agreements.

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FACE-TO-FACE MEETINGS

1st. Meeting - Kick off in Barcelona

Date	Attendees
16th. December 2016	32

Topics for discussion:

- WG4 will focus on the financial schemes possibilities that can be applied to the EEB projects that are selected throughout the WP3 Testing process.

Conclusions and Agreements:

- Analyse experiences in financial practices
- Expand the experienced scheme to the whole project area.
- Identify the best financial solutions to renovate 100 buildings selected by all SHERPA partner regions.
- The WG will operate in close relationship with the other WP3 working groups, and apply a local and regional integration approach.
- The steps will be:
  - Determine the financial needs of the projects, as per their study through WG1,2,3.
  - Search and identify financing possibilities.
  - Prepare, develop and implement the financing protocol to each EEB project.
- ***The output is an Innovative combination and optimization of financial models for EEB, combined within a single tool.***

2nd. Meeting - Steering Committee in Rome

Date	Attendees
14th. June 2017	34

Topics for discussion:

- Focus on understanding which private financing schemes could work better in order to increase investments.
- Private financing schemes could be working together with public financing instruments
- EXplanation of the four steps of the financial process in order to determine the project's financial feasibility.

Conclusions and Agreements:

- The partners concluded that assess the local financial situation through the table is essential in order to understand the options present for that specific region and decided to focus on filling this table with the needed data.

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3rd. Meeting - Steering Committee in Crete	
Date	Attendees
21st. November 2017	38

Topics for discussion:

- Explication of the financial model was performed in order to show the partners how to use the model to assess the projects they are working on.
- Two real examples and analysis were carried on.
- Stops more investment in energy renewal to be done is the incapability of many public entities to fund more debt.
- Discussion on Eurostat and the contact EPC. EU and Eurostat pose some limitations.

Conclusions and Agreements:

- These have been discussed and the partners agreed on inserting in the financial model a simplified methodology in order to easily assess whether the investment will be accounted as public debt or private ones.
- The partners agreed on make a further analysis on the Eurostat document in order to fully understand in which occasions the investment has to be accounted as public liability.

4th. Meeting - Steering Committee in Rome	
Date	Attendees
20th. April 2018	30

Topics for discussion:

- Specific Steering Committe focused on Testing Phase
- Presentation of the Financial Tool draft
  - Presentation of the four steps to define the financial process:
    - 1. Promoter assessment
    - 2. Credit assessment
    - 3. Project assessment
    - 4. Return assessment
  - Presentation of the obtained three outputs:
    - 1. Analysis
    - 2. Matching of financing alternatives
    - 3. The consideration of debt (public or not).

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Conclusions and Agreements:

- Financial characterization (by country): at least one partner per country has to perform this study in order to better understand the local financial situation of the region and see if there are opportunities or bottle necks within the region itself when talking about financing a project
- Financial modelization (per project): each partner has to perform a financial assessment for each of the projects that if has committed to the project, using the financial tool created
- Final financial roadmap (per project): for each one of the buildings involved in the project, a financial roadmap has to be prepared to optimize the time and the resources involved in the process of closing the financial deal and permit the project to be done without any further delay.

5th. Meeting - Steering Committee in Marseille	
Date	Attendees
18th. July 2018	28

Topics for discussion:

- Presentation of the FINAL Financial Tool
  - Presentation of the four steps to define the financial process:
  - 1. Promoter assessment / 2. Credit assessment / 3. Project assessment / 4. Return assessment
  - Presentation of the obtained three outputs:
    - 1. Analysis / 2. Matching of financing alternatives / 3. The consideration of debt (public or not).
- Presentation of the Practical Case as an example of how to se the financial tool and showed the main results.

Conclusions and Agreements:

- It has been prioritised the technical part of ERB process, while giving less importance to make a ERB project financially feasible
- Many projects have been financed with public funds even if they fulfil the criteria to get private funding
- It is important to understand the financial process methodology that investors and financial institutions apply to assess ERB projects.
- It is also important to gain more knowledge about the funding alternatives
- The Main goal of using the Financial Tool is getting aware and trained about the financial process of an ERB project and being acknowledgeable about funding alternatives in ERB projects
- In cases where standard financing alternatives do not work, the tool should allow to conceive innovative financing alternatives to get the project done (i.e combining public and private funding sources, new funding ways with longer maturities…).

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TELECONFERENCE MEETINGS

1st. Meeting - TELCO

Date	Attendees
7th. February 2017	11

Topics for discussion:

- To identify and validate the financial roadmap of every single ERB project and describe the processes to determine the optimal financial scheme chosen for each project.
- 1rst PART: Defining the Financial Model
  - Analyse past and ongoing financial practices in EEB from the territories of the partners.
  - Identify and agree the financial process to allow EEB project be financed.
- 2nd PART: Financial structuring of SHERPA Projects
  - Identify investment needs to be covered.
  - Identify specific financing alternatives for specific SHERPA projects

Conclusions and Agreements:

- The partners were asked to fill a first template containing past and ongoing financial practices in EEB from the territories and partners taking part in the Project.

2nd. Meeting - TELCO

Date	Attendees
19th. April 2017	16

Topics for discussion:

- All partners shared their experience by presenting the projects involved in the WG4. A special focus was given, when possible, to the IRR (internal rate of return) and to the financial structure of the projects as well as the specificity of each of them.
- After presenting the projects, other European ones, already financed, were shown and expained (buildings located in France, Italy and Spain) in order to help detecting further solutions.
- After analysing all the cases, the most innovative projects were detected and being discussed.
- The Emilia Romagna case was one of the most interesting as it provides a mix of public and private financing possible thanks to ''Cassa Depositi e Prestiti'', a public financial vehicle who was available for helping the projects in obtaining funds at competitive interest rates (in some cases the interest was only 0.5%).

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Topics for discussion:

- The Catalan one was also interesting as it applied the EPC (Energy Performance Contract) contract through ESCO (energy service company) as a promoter.
- In addition, both traditional and innovative financial schemes were presented (based mainly on the Catalonian projects/experiences); for each choice a brief explanation was available to underline the potential of the alternative and also the best scenario for choose and apply that specific one in order to maximize the outcome of the project. The characterization of the alternatives will be very important as the project moves to the next step.
- The best financing alternative found were:
  - Crowd funding
  - Crowd lending
  - Equity crowd funding
  - Private-Public new formulas

Conclusions and Agreements:

- The majority of the projects reflected on the template are financed By public funds
- Many projects would result interesting both for private and public investors as the projected returns and pay back period complain in many cases with the conditions asked in the private sector
- The biggest or the whole share of the investment is considered as a debt for the public administration. This is limiting the possibilities in investing due to the fact that the European Union is asking very strict conditions and does not permit to add more debt in the balance sheet, even if return and pay back time would be interesting
- Because of the reasons stated above many investment can be done jut through European funds and many projects can't get enough funds
- The most innovative schemes from the templates received could be the Catalunya ones (EPC based) and the one from Abruzzo (public-private Partnership)

3rd. Meeting - TELCO	
Date	Attendees
26th. September 2017	10

Topics for discussion:

- The four steps of the financial process (already listed in the section above) are:
  - Promoter data: it aims to understand how solvent is the promoter of the project; although this is an important step, in this case it is pretty easy to understand if the promoter would be solvent as all the promoters are public and plenty of info are available to the public;
  - Credit Assessment: define how the debt will get paid back. Time, rate of interest, entities involved and responsible; even this step should be easy as the majority of the debt is usually held by the public administration;

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Topics for discussion:

- Project Assessment: this is the technical part of the project. Understand is the goal is reachable (for instance, in historical building, the situation could be challenging and the result could not be 100% guaranteed / there could be uncertainty regarding the final price of the project itself due to the difficulty);
- Return Assessment: once the situation regarding the solvability of the promoter and the technical aspects are clear there is the need to focus on the 'return' of the investment: the IRR (Internal Rate of Return); this part, financially speaking, it is the most important as it opens (ore closes) the doors to different financial alternatives. A high IRR will give the promoter lots of different choices, both traditional and alternative. With a low IRR the need to find other form of financing becomes evident and it is crucial to get a positive outcome.
- The table that matches financing alternatives with their requirements was explained to the partners. In this table, the partners can check at which alternatives are available at some conditions (depending mainly on IRR, maturity and size of the investment).
- An example regarding the ''Ciutat de la Justicia'' was also made, presenting some sensitive data and the alternative selected for the project.
- The filling of the table was then explained point by point with the example of the financial markets situation in Catalonia.

Conclusions and Agreements:

- It was agreed that by the next meeting partners would have tried to detect the specificities of their own regions in order to present their own table.

4th. Meeting - TELCO	
Date	Attendees
28th. February 2018	13

Topics for discussion:

- Getting funds depend from the expected return and this can change from a region to another. Because of this, every region was asked to do a researches and define what is the return requested by each of the several financing entity took into consideration.
- The model of the Vall Hebron Hospital was presented as an example. Main data such as consumption, investment needed, savings reachable through this investment and others.
- The tool was reviewed: the different sections were explained and presented to the partners.
- The outcome section aims to show if the investment is financeable or, in case of a negative outcome, how much of public grants are needed to meet the minimum IRR requested.
- The tools tries to focus primarily on private funding solutions, followed from publics ones when the private ones fail to fund the project.

Conclusions and Agreements:

- The partners agreed on analyse their local financial market situation in order to detect opportunities and bottle necks.

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4 The Financial Model

The Financial model of the WG4 has its materialization though the SHERPA FUNDING TOOL that systematizes the financial process of analysing and ERB project and its funding feasibility.

4.1 Introduction

The purpose of the SHERPA FUNDING TOOL (Global Model v.19) is to assess the fundability of investments in energy efficiency from a financial point of view and assess the characteristics of the agents promoting the investment and of those who are going to carry it out.

The structure of the tool is based on an individual assessment of each one of the elements that affects to the risk and profitability of the project.

4.2 Main requests and input data

The first section encountered is the Macro one. From here, by clicking each of the buttons, it is possible to open the area related to that button.

In addition, two more options are to be selected.

Whether the payer is public or private, it needs to be stated two times, one in the white space trough a drop-down menu and another second time, before inserting the data of the payer, in order to let the program receive the command to apply the formulas to either private or public payer.

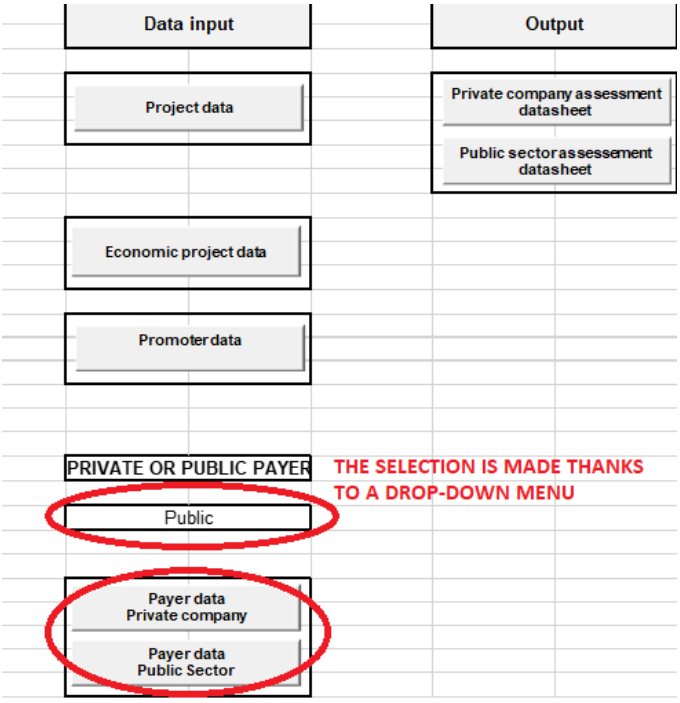

Figure 8. Types of payer

The **"project general data"** sheet for the project seeks to identify the investment required, the total consumption of the structure and the savings that can be achieved, together with the degree of preparation of the project itself (for instance: is there an energy audit?).

This section hence includes a set of technical data and the contractual data, which could affect the completeness of the project. The purpose of the contractual data is to show the degree of coverage with which the promoters of the project have created for the correct functioning of the project.

The technical data for the project is divided by energy saving measures, active passive and renewable.

The information of savings may be inserted for monthly, quarterly or yearly periods depending on the degree of accuracy desired for the analysis and the intervals at which the data is available.

The chart below shows the structure for the presentation of the points referred to, with the technical data coming first.

PROJECT IDENTIFICATION				
Name of the project				
Sector of activity				
PROJECT TECHNICAL DATA	INVESTMENT		RESIDUAL VALUE	
	Amount (€)	Date	Amount (€)	Date
1) Improvement of energy efficiency by thermal envelope and other passive measures				
2) Improvement of energy efficiency in thermic and lightening installations and other active measures				
3) Substitution of conventional energis by renewables				
TOTAL INVESTMENT	0			
PRESENT TOTAL CONSUMPTION (YEARLY)	Consumption Period (M,Q,Y)	Y		
	YEAR			
Amount in euro				
ENERGY SAVINGS (in %)				
1) Improvement of energy efficiency by thermal envelope and other passive measures				
Start of the energy efficiency savings				
	YEAR			
%				
2) Improvement of energy efficiency in thermic and lightening installations and other active measures				
Start of the energy efficiency savings				
	YEAR			
%				
3) Substitution of conventional energies by renewables				
Start of the energy efficiency savings				
	YEAR			
%				

Figure 9. Project General Data

And for the "**contractual data"** the boxes contain drop-downs which make it easier to provide the information requested.

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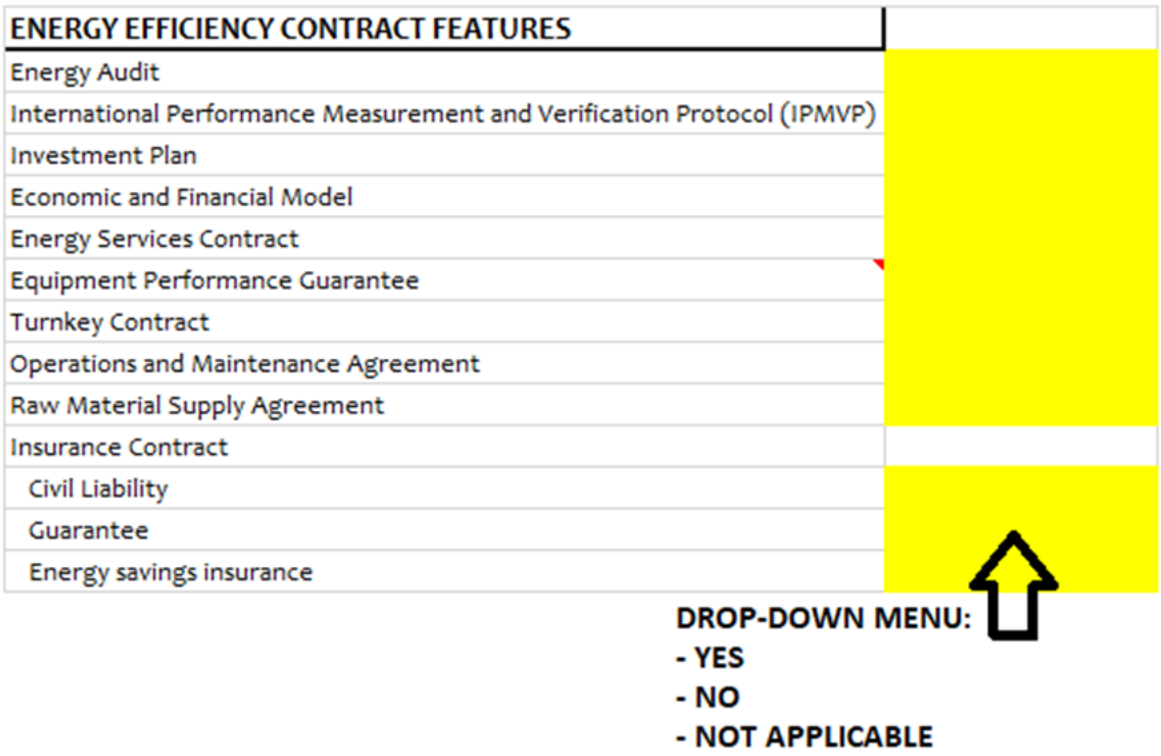

Figure 10. Contractual data

The second sheet "**Project Economic data"**, also reserved for input of data, is fundamental in the calculation of the return on the investment. The calculations take into account the data inserted in the first one plus others, such as the subsidies or public aid which granted, the impact of inflation and the duration of the contract, all typed in this second section.

''Additional operating expenses'', 'maintenance'', as well as ''start date of the model'' and ''duration of the contract'' are all taken into account in order to calculate the IRR, pay-back period and the cash flow expected during the contract.

Moreover, given that the analysis may cover a very long period - a maximum of 50 years as stated above - there is the possibility of updating both energy savings and the expenses of the project over time according to the movements of the index considered most appropriate. In this regard the Consumer Price Index ("CPI") and an energy prices index ("IPE") are already included but the programme allows the inclusion of any other indices thought suitable.

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INVESTMENT		
Concept	Amount (€)	Date
1) Improvement of energy efficiency by thermal envelope and other passive measures		
2) Improvement of energy efficiency in thermic and lightening installations and other active measures		
3) Substitution of conventional energies by renewables		
TOTAL		
PUBLIC GRANTS/ SUBSIDIES/ TAX INCENTIVES		
Concept	Amount (€)	Date
1) Improvement of energy efficiency by thermal envelope and other passive measures		
2) Improvement of energy efficiency in thermic and lightening installations and other active measures		
3) Substitution of conventional energis by renewables		
PROJECTION PERIOD. CONTRACT (years)		
START DATE OF THE MODEL (mmm/yy)		

Figure 11. Project Economical Data – General data

ADDITIONAL OPERATING EXPENSES						
Concept	Anual amount (€)	Periodicity	Start period	End period	Anual update	
					Index	% of application of the index
1) Improvement of energy efficiency by thermal envelope and other passive measures						
2) Improvement of energy efficiency in thermic and lightening installations and other active measures						
3) Substitution of conventional energis by renewables						

Figure 12. Project Economical Data –Additional data

REPLACEMENT INVESTMENTS				
Concept	Replacement period (years)	Replacement proportion (%)	Anual update	
			Index	% of application of the index
1) Improvement of energy efficiency by thermal envelope and other passive measures				
2) Improvement of energy efficiency in thermic and lightening installations and other active measures				
3) Substitution of conventional energis by renewables				

Figure 13. Project Economical Data –Replacement investments

GENERAL HYPOTHESIS	Price Index Variation					Anual growth of consumption	
	CPI (Consumer Price Index)		EPI (Energy Price Index)				
	%	period (years)	%	period (years)		%	period (years)
	1.50%	20	1.50%	20			
ANUAL UPDATE OF ENERGY CONSUMPTION							
Index	CPI						
% of application to the index							

Figure 14. Project Economical Data –General Hypotesis

"Annual update of energy consumption" is the percentage of the application of the inflation index.

For instance, if inflation is supposed to be 2% over the next 20 years, but in the contract it is stated that only half inflation is to be applied, 50% has to be inserted in "% of application of the index".

If no inflation is applied in the contract, the cell has to be leaved blank as showed above.

The two indicators applied in the financial assessment of energy saving projects are: the internal rate of return (IRR) of the project and the pay back of the same.

The pay back is the number of years in which the initial investment is recovered taking into account the return the investment provides.

	Global		1) Improvement of energy efficiency by thermal envelope and other passive measures	2) Improvement of energy efficiency in thermic and lightening installations and other active measures	3) Substitution of conventional energis by renewables		
IRR of the project	14.40%			14.40%			
Pay back (years)	6 (2024)			6 (2024)			
CASHFLOW CHECKING	2018	2019	2020	2021	2022	2023	2024
Investments	-550,000						
Public grans / subsidies							
Residual value							
Energy savings	8,333	100,000	100,000	100,000	100,000	100,000	100,000
Additional operating expenses							
Replacement							
Anual cashflow	**-541,667**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**

Figure 15. Pay-Back study

The third sheet "**Promoter Data"** analyses the technical ability of the promoter, its ability to provide an experienced execution of it.

The focus is on the amount of projects developed before the project analysed and the economic magnitude of those investments.

Moreover, the experience of the promoter expressed in years, permits to have a better degree of comprehension of the know-how of the promoter.

FUNDING REQUIRED BY:	
NAME	
CONTACT PERSON DETAILS	
-Name and Surname	
-E-mail	
-Telephone	
-Address	
-Town/City	
-Postcode	
ESCO PROJECTS CARRIED OUT TO DATE	
Investment amount up to 25000.0 euro	
Investment amount from 25001.0 to 50000.0 euro	
Investment amount from 50001.0 to 100000.0 euro	
Investment amount from 100001.0 to 250000.0 euro	
Investment amount from 250001.0 to 500000.0 euro	
Investment amount from 500001.0 to 750000.0 euro	
Investment amount from 750001.0 to 1000000.0 euro	
Investment amount higher than 1000000.0 euro	
YEARS OF EXPERIENCE WORKING AS A PROMOTER	
DO YOU OWN ANY ASSETS TO SECURE THE LOAN?	
IS THE PROMOTER HAVING ANY TECHNICAL SUPPORT OVER THE LENGTH OF THE CONTRACT?	
IS THE MANAGER OF THE BUILDING INVOLVED IN THE PROMOTION OF THE PROJECT?	

Figure 16. Promoter data

The four sheet **"Payer data"** refers basically to the economic solvency of the public or private entity who assumes the responsibility of repaying the finance which must be obtained in order to put the project into operation. The data to be included varies according to whether the subject is a private company or a public entity.

Whereas the payer of the project is a public sector entity, the financial data included refers to the budgetary balance and the level of indebtedness of the public corporation. The specific characteristics of the financing of the project it is sought to put into operation are also included.

PUBLIC SECTOR			
Name	Generalit de Catalunya		
Administration level	Regional		
Type of public sector entity	Public administration		
Population of your administrative area	More than 250.000		
Have you been rated by a rating agency?	**Yes**		
Which rating agency?	Standard & Poor's	Moody's	Fitch
	Yes	Yes	Yes
Rating assessment			
Standard & Poor's	**B+**		
Moody's	**Ba-**		
Fitch	**BB**		
Budget indicators			
Last closed fiscal year	2016		
Primary deficit/surplus: Total deficit/surplus net of interest payments (euro)			
Total deficit/surpuls (euro)			
Gross debt: value outstanding at the end of the year (euro)			
Revenues (Budget execution, last closed fiscal year)			

Figure 17. Public Payer data

When the payer is a private company, in addition to contact information there must be information on financial progress in the last three financial years in terms of turnover, EBITDA and CASH FLOW and on the structure of the balance sheet in the last financial year. These data makes it possible to calculate certain indicators for an assessment of the solvency and future prospects of the company assuming payment undertakings to third parties. Information is also included on the degree of compliance with legal and tax obligations.

It is also possible to include information on the rating of the company if this is available, although few companies actually have one assigned to them.

PRIVATE COMPANY		
Company name		
Address		
Town/City		
Postcode		
Contact person		
Telephone		
E-mail		
Is the company part of a corporate group?		

ECONOMIC DATA		
Years in business		
Number of employees		
Annual turnover (last 3 years)	Amount (euro)	Year
Balance Sheet Period ending:		
- Total assets		
- Current assets		
- Total liabilities		
- Net assets	0	
- Current liabilities		
EBITDA[1] (last three years)	Amount (euro)	Year
Profit before taxes (last three years)		
	Amount (euro)	Year
EBITDA[1]/Interest expenses on the last year Ratio (Interest Coverage Ratio)		
Debt/Debt plus Equity Ratio on the last year (Leverage Ratio)		
[1] EBITDA: earnings before interests, taxes, depreciation and amortitzations.		
Is the company up to date with central government taxes?		
Is the company upt to date with Social Security?		
Is the company up to date with local taxes?		
Have you met all your payment obligations in the past?		
Have you been rated by a rating agency?		
Which rating agency?		
Which credit rating have you been assigned?		

Figure 18. Private Payer data

4.3 Explanation and use of the tool

At the end of the financial tool, the complete output is available.

The data inserted in the tables explained above provide sufficient information to carry out an assessment of the project. However, a synthesis is necessary in order to make an overall assessment.

4.3.1 First Output: Funding Feasibility

To achieve this, a weighting system has been devised with a maximum of 100 points. The weighting of each of the characteristics taken into account may be adjusted to allow for experience and checks made prior to application.

100	**MAXIM SCORING**
0 - 50	**NO FUNDING FEASIBILITY** WITH HIGH LEVEL OF ISSUES TO WORK ON
50 - 75	**FUNDING FEASIBILITY** WITH MEDIUM LEVEL OF ISSUES TO WORK ON
75-100	**FUNDING FEASIBILITY** WITH LOW LEVEL OF ISSUES TO WORK ON

PROMOTER / APPLICANT DATA		
PUBLIC PROMOTER	**UP TO**	10
…….		0
PROJECT DATA	**UP TO**	10
CREDITOR DATA	**UP TO**	30
RETURN/PROFITABILITY	**UP TO**	50
TOTAL SCORING		**100**

Figure 19. Funding Feasibility

The final outcome is presented in the form of a file with the project's overall points score (Financeable, Project with possible financing problems and Not Financeable) and the points obtained by each of the parameters included in the assessment. There are two different types of project assessment file depending on the type of paying agent (private company and public sector) to adapt the contents to the various parameters included in the model to assess the customer's solvency.

The number of points obtained in each of the parameters and dimensions considered gives a "mark" represented visually by the traffic-light colours, hence:

- The colour red (less than 50 points) means that the dimension or the parameter represents a problem from the point of view of the financing of the project. In the case of the overall assessment of the project the colour red means that the assessment model shows that the energy efficiency investment project is not financeable.

- The colour yellow (between 51 and 74 points) means that the dimension or parameter could give rise to difficulties in terms of obtaining finance. In the case of the overall assessment of the project the colour yellow means that the assessment model shows that the energy efficiency investment project may have financing problems but that with alterations to the weakest parameters (identified in the details of the assessment) those problems could be resolved.

- The colour green (75 points and above) means that the dimension or parameter represents a point in favour from the point of view of the financing of the project. In the case of the overall assessment of the project the colour green means that the assessment model shows that the energy efficiency investment project is financeable.

The results of the assessment model are presented in graphic form in order to make it possible to identify visually the relative position of each dimension and parameter on the scale, information which supplements the "mark" obtained and which makes it possible to see the relative distance to the boundary line for changing the classification.

PROJECT ASSESSMENT

Dimension (weight)	Points	Comment
Promoter assessment (10%)		Strong solvency of the promoter
Project assessment (10%)		Project with high degree of maturity
Payer assessment (30%)		Low risk of non-payment
Profitability assessment (50%)		Moderate profitability of the project
TOTAL ASSESSMENT		The project may have financing problems

ASSESSMENT DETAILS

Promoter assessment		High solvency
Similar projects		Strong experience in similar projects
Experience of the promoter team		Large number of years of experience
Project assessment		High degree of maturity of the project
Energy Audit		The project includes energy audit
Technical Project		The project includes tehcnical project
Investment Plan		The project includes investment plan
Economic and Financial Model		The project includes economic and financial model
Energy Services Contract		The project includes energy services contract
Equipment Performance Guarantee		The project includes equipment performance guarantee
Turnkey Contract		The project does not include turnkey contract
Operations and Maintenance Agreement		The project does not include operations and maintenance agreement
Raw Material Supply Agreement		The project does not include raw material supply agreement
Insurance Contract		
- Civil liability		With civil liability insurance contract
- Guarantee		Without guarantee insurance contract
- Energy savings insurance		With energy savings insurance contract

Payer assessment		*Low non-payment risk*
Credit risk of the company		*Low risk*
- Years in business		*The company has not been in business for a long time*
- Number of employees		*Large company*
- Turnover evolution		*Company turnover has increased over the last two years*
- EBITDA evolution		*EBITDA has increased over the last two years*
- Interest coverage ratio		*The interest coverage ratio value is adequate*
- Company leverage ratio		*The company level of indebtness is quite high*
- Working capital		*Moderate level of working capital*
- Compliance with payment obligations		*The company has met all its payment obligations in the past*
Project leverage ratio		***The project leverage ratio is quite high***
Profitability assessment		*The project has moderate profitability*

PROJECT SUMMARY

Data on the promoter			
Promoter type	ESCO	Name	ESCO
Town/City			more than 5 years
Data on the customer company			
Name	TRACIS	Town/City	Barcelona
Years in business	From 3 to 5 years	Number of employees	From 10 to 25 employees
Technical and economic data on the project			
Type of measure	Energy savings (in %)		
Active	30,0%	Required borrowing	50.000 €
Passive	-	Investment term	15 years
Management and other	-	Pay-back	8 years
Amount of the investment	350.000 €	IRR	11,43%

Figure 20. First Output: Funding Feasibility

4.3.2 *Second Output: Funding Alternatives Matching*

This last part provides info regarding the feasibility of some kind of financing schemes, given the project and local financial situation.

The matrixes below represent the local situation of Catalonia.

By elaborating and combining this data with the overall project, the result will show the possible financing alternatives available.

	IRR					Maturity (years)					Amount (thousand euros)		
From:	-100.00%	0.01%	5.01%	7.01%	10.01%	0.00	5.01	10.01	12.01	20.01	0	100	500
To:	0.00%	5.00%	7.00%	10.00%	100.00%	5.00	10.00	12.00	20.00	100.00	100	500	10,000,000
CAPITAL RISK	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
TRADITIONAL BANK FINANCING	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
ETHICAL BANK FINANCING	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
COOPERATIVE FINANCING	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
EQUITY / CROWDLENDING	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	No

Figure 21. Project and local financial situation

By taking into account IRR, maturity of the project and amount to invest the sheet will provide different results:

- OK in green if it's possible to get funded by that specific type of financial investor;
- A yellow cell if there is one of the factors taken into consideration that does not fit that specific type of investor and the reason (''too low IRR'', ''too high amount'', ''too long maturity'');
- A red cell with ''no acceptable'' as a message if two or more conditions are not met.

Sector	Public Sector
Data of the project	
IRR	10.16%
Maturity (years)	12
Amount (thousand euros)	750.0

FINANCING SOURCES AVAILABLE FOR THE PROJECT	
CAPITAL RISK	OK
TRADITIONAL BANK FINANCING	OK
ETHICAL BANK FINANCING	OK
COOPERATIVE FINANCING	Not Applicable
EQUITY / CROWDLENDING	Not Applicable

Figure 22. Financing sources available

If the Project itself presents a lower than 5% IRR, a public grant is needed in order to finance the Project. In the next table the amount of grants needed is provided if the IRR is lower than 5%.

GRANTS NEEDED TO GET A MINIMUM 5% IRR	
Public financing (grants)	**0.00%**
Minimum IRR to be achieved	5.00%
Public grants needed	€ -
#N/A	

Figure 23. Grants for financing

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At the very end of the model, some important questions need to be answered to understand if the investment will or will not be computed as debt in the balance sheet of the promoter.

This is very important, especially in projects promoted by public entities, as some limits have to be respected from an overall deficit / debt position point of view.

If the answers to the last question is NO and the answer to the other ones is YES, then the investment is not computed as debt for the public entity.

Unfortunately, if just one of the answers is different, then the investment is computed as debt in the balance sheet.

ANSWER THE QUESTIONS TO UNDERSTAND WHICH ENTITY WILL COMPUT THE DEBT	
Conditions about computing as debt the amount of the contract	
Could the investor be a different entity from the promoter?	Yes
Could the investor support all the risks and rewards of the investments?	Yes
Could the investor be the economic owner of the assets?	Yes
Is the public promoter securing the investment in any way?	No
Non computing as debt	

Figure 24. Answers to determine if the investment will or will not be computed as debt in the balance

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5 *Personalisation for each region*

Over the duration of the WG4, a local financial characterization was developed by the participants, in order to better reflect the local situation of the capital markets and the conditions at what funds for energy saving investment are granted.

The table below shows the list of the members and their responsibilities in the frame of the WG4:

Partner's Logo	Member	Responsibilities
Generalitat de Catalunya Departament de Territori i Sostenibilitat	GENCAT	WG leader with TRACIS Regional Pilot Buildings identification
CPMR CRPM	CRPM	Communication coordinator
XXX aniversari 1986-2016	IVE	Regional Pilot Buildings identification
	EMILIA ROMAGNA	Regional Pilot Buildings identification
REGIONE LAZIO	LAZIO	Regional Pilot Buildings identification
REGIONE ABRUZZO	ABRUZZO	Regional Pilot Buildings identification
eco gozo a better gozo	GOZO	Regional Pilot Buildings identification
DUNEA	DUNEA	Regional Pilot Buildings identification
Περιφέρεια Κρήτης Region of Crete / ΚΑΠΕ CRES	CRETE / CRES	Regional Pilot Buildings identification
AMORCE DÉCHETS | ÉNERGIE | EAU	AMORCE	Municipal Pilot Buildings identification

Table 3 Working group 4 membership

Catalunya and Emilia Romagna did perform the local financial characterization and they used the SHERPA FUNDING TOOL very extensively, their results could be extended to the other regions of SPAIN (Valencia) and ITALY (Lazio and Abruzzo). This is because of the financial characterization is similar within each country, thus permitting to apply a local situation on a national scale, with a very small margin of error.

Below show two representative examples of the personalization of the Financial Schemes provided by ITALY (Emilia Romagna) and SPAIN (Government of Catalonia).

THE PRIVATE FINANCING TEMPLATE: CHARACTERISTICS OF DIFFERENT FUNDING OPTIONS Define the specific Financing Requirement for each Financing Alternative in your Regions									
			Private Equity	Traditional bank loan	Ethical banking	Cooperative financing	Crowd funding	Crowd lending	Equity Crowd funding
PROMOTER									
	PUBLIC		NO	YES	YES	N.A. information	NO	NO	NO
PROJECT									
	ACTIVE MEASURES		NO	YES	YES	NO/YES	NO	NO	NO
	PASSIVE MEASURES		NO	NO/YES	YES	NO/YES	NO	NO	NO
	RENEWABLES		NO	YES	YES	NO/YES	NO	NO	NO
PAY BACK PERIOD			X years	≤ 10 years	≤ 15 years	X years	X years	X years	X years
INTEREST / IRR			X %	≥7-10%	≥12-13%	X %	X %	X %	X %
WARRANTIES									
	KIND OF WARR.		PERSONAL/ REAL	REAL	REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL	PERSONAL/ REAL
TOTAL INVESTED AMOUNT			HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM /LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW	HIGH / MEDIUM / LOW

Figure 25. Financial Characterization of ITALY (Emilia Romagna region)

		Private Equity	Traditional bank loan	Ethic banking	Cooperative	Crowfunding	Crowlennding	Equity Crowfunding
PROJECT								
	PUBLIC	NO	YES	YES	NO	NO	NO	NO
PROJECT								
	ACTIVE MEASURES	YES	YES	YES	YES	YES	YES	YES
	PASSIVE MEASURES	NO	YES	YES	YES	NO	NO	NO
	RENEWABLES	YES	YES	YES	YES	YES	YES	YES
PAY BACK PERIOD								
	MAX PAYBACK	15 YEARS	10/12 YEARS	15/20 YEARS	MORE THAN 5 YEARS	LESS THAN 5 YEARS	LESS THAN 5 YEARS	LESS THAN 5 YEARS
INTEREST								
	RATES IN SPAIN	MORE THAN 10%	7%	LESS THAN 7%	LESS THAN 5%	0%	MORE THAN 5%	MORE THAN 5%
WARRANTIES								
	KIND OF WARR.	PERSONAL	PERSONAL	PERSONAL	PERSONAL	PERSONAL	PERSONAL	PERSONAL
INVESTED AMOUNT								
	MAXIMUM	HIGH	HIGH	HIGH	MEDIUM	LOW	LOW	LOW

Figure 26. Financial Characterization of SPAIN (Catalonia region)

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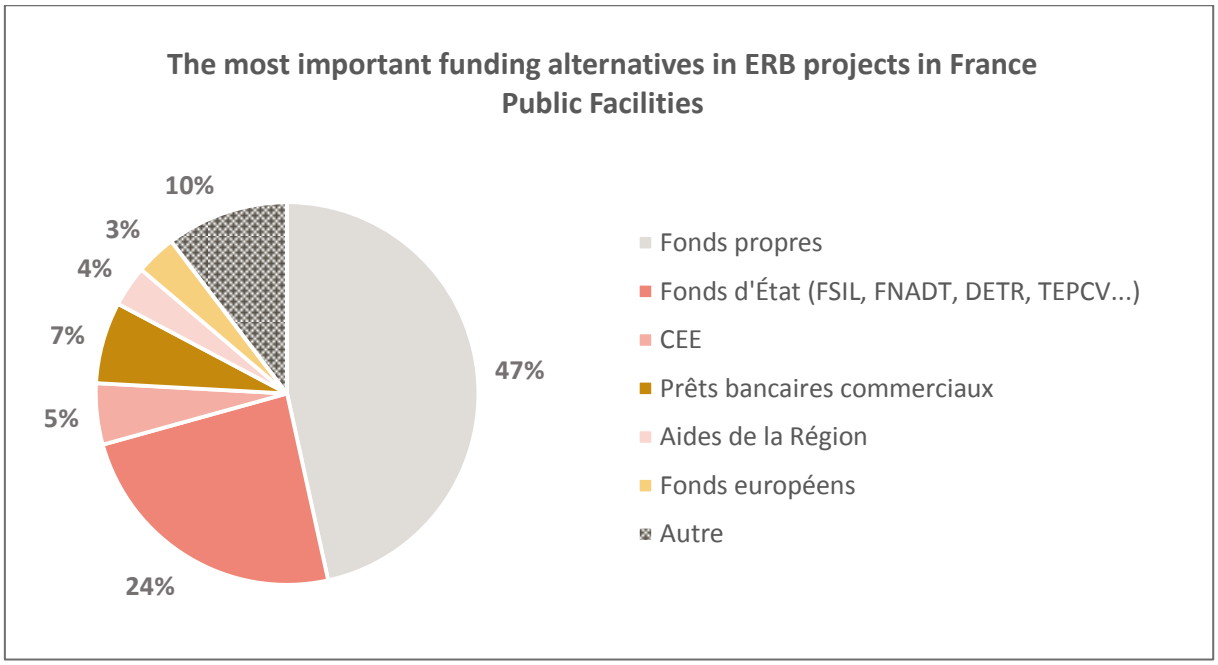
From the personalization above one of the important points it is to conclude that the EPC agreements led to some innovation for the public sector. Catalunya is applying this type of contract, while this is not used by other partners. EPC encourages public and private collaboration and there are high chances that adopting this method to different European regions will provide some new best practice, useful for all the partners.

Other partners, such as the GREEK ones (Crete and CRES) based their financial analysis on the hypothesis that only public funding is available according its financial situation.

Other partners, such as AMORCE, GOZO and DUBROVNIK, have been working with the financial characterization developed by Catalunya meanwhile using the SHERPA FUNDING TOOL.

AMORCE also published in January 2019, a survey that aims to identify the most common financing alternatives for ERB in public facilities in France.

They enquired 62 French public entities. Almost all of the interviewed stated that, in order to finance energy savings projects, they usually have to partially use their own funds in order to get the project done. Other important sources are French and EU funds while private ones (commercial Loans) cover just 7% of the total funding alternatives.



Graphic 1 Funding energy renovating alternatives in France

CEE (Energy Economy Certificate), introduced in 2005, is the fourth biggest method used in France in order to complete ERB projects.

The structure of the CEE is the following:

- For a given period, each energy supplier has an energy saving obligation corresponding to its market's shares. When an energy supplier implements energy saving measures towards energy consumers, he may receive certificates.

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- Energy savings can be carried out by each energy supplier in all sectors (residential, tertiary, agriculture, industry, transports...).
- The Certificates may be freely traded. At the end of the period, each energy supplier must demonstrate the fulfilment of its obligation by providing the corresponding amount of white certificates.
- An energy supplier failing to do so receives a financial penalty.

One of the main conclusions of this report is that external private sources of financing are still lacking behind compared to the other public funding methods.

Moreover, another key factor to emphasize is that the administrative procedures to complete in order to receive additional funds are perceived as time-consuming by the subjects interviewed.

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6 Conclusions

The Financial view is an essential part of an ERB process. But so far, it has been prioritised the technical part of ERB process, while giving less importance to make an ERB project financially feasible.

Many projects have been financed with public funds even if they fulfil the criteria to get private funding.

Budget constraints in many European countries and high goals set on ERB actions imply the need for the development of new and more standardised financing alternatives (such as third-party financing, Public-private partnership).

So, it is very important to:

- understand the financial process methodology that investors and financial institutions apply to assess ERB projects, and
- to gain more knowledge about the funding alternatives

Therefore, is important to be aware and trained about the financial process of an ERB project and being acknowledgeable about funding alternatives in ERB projects.

Using a SHERPA FUNDING TOOL created by the WG4 is a way to do it.

- The tool is conceived as an ongoing instrument that should be nourished with new financing alternatives and try to match those financing alternatives with real and specific cases.
- So, the tool should improve and allow new ways to develop new innovative funding alternatives.
- In cases where standard financing alternatives do not work, the tool should allow to conceive innovative financing alternatives to get the project done (i.e combining public and private funding sources, new funding ways with longer maturities…).
- The main point is that the TOOL must be used, despite the fact that some ERB Sherpa projects have already public funding.
- Introducing the data of the projects in the tool will help to understand the financial methodology in a practical basis.
- Once funding alternatives have been identified through the use of the tool, you will be able to analyse and improve them even further.

What we have achieved in the WG4?

- We have agreed on the Financial process methodology.
- We have agreed about the Methodology of description of Financing Alternatives
- We have created the Financial SHERPA FUNDING TOOL
- We have partially done the description of Financing Alternatives in every country.

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- And we have started applying Financial Process methodology to specific projects and we have started a debate on innovative financial schemes or PPPs structures pending.

But still a considerable work should be contemplated on the future about applying what we have agreed and what we have developed though the SHERPA FUNDING TOOL trough real cases; and then generates a deep debate on how to innovate the current funding alternatives.