SUDOE Methodology

Guide to prepare an ex-ante assessment focused on energy renovation in building sector

REHABILITE Project
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Other Informations:
Lisboa E-Nova is a private non-profit association whose purpose is to promote the sustainable development of Lisbon and its metropolitan area, supporting integrated approaches towards a low carbon and more energy efficient city. (www.lisboenova.org)

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Executive Summary

The energy efficiency and the deep renovation of existing building stock in Europe is crucial to achieve climate goals and decarbonize the European cities until 2050. To pursue these objectives, it is necessary to overcome several barriers with the introduction of innovative financial instruments (FI). A FI is a financing technique to fund projects, that could use loans, guarantees, capital and other risk covering mechanisms, possibly combined with technical assistance, interest rate subsidies or subsidies on guarantee fees. The FI aims to address market failures and should capture increased public and private co-investments. The current requirements from European regulation defines that it is necessary an ex-ante assessment to support the implementation of measures through a FI. In this context, the SUDOE methodology is a tool developed by REHABILITE project for three regions in Spain, Extremadura, Navarra and Murcia, Aquitaine-Limousin-Poitou-Charentes in France and Lisbon in Portugal. The purpose of this methodology is to support the Managing Authorities (MA) in the design of their ex-ante studies.

The SUDOE methodology is structured in six chapters. The chapter one contextualizes the importance of energy renovation in buildings and presents information about the political and European regulatory framework for the development of financial instruments. The chapter two provides a toolbox of methodologies to be used during the development of an ex-ante study. The chapter three details the SUDOE methodology which comprises three activities, the general characterization of the potential market size, the SWOT analysis and the funding gap calculation. The chapter four applies the SUDOE methodology providing a short guidance of contents to simplify and structure the work during the development of the ex-ante assessment. In chapter five are presented the lessons learned during the REHABILITE project with emphases, to the problems found during data collection and information access, the main achievements and the engagement level with public authorities. The last chapter leads the readers to the main conclusions highlighting the importance of sharing experiences among European regions in order to improve the technical development of ex-ante studies and the importance of participatory processes to create awareness among MA and other stakeholders.
1. Introduction

The energy efficiency and the renovation of the existent building stock in Europe is key to achieve the climate and energy targets for 2020 and 2050. Several European Union Directives provides the framework to improve energy efficiency and to renovate buildings. However, there is a need to overcome several barriers that are preventing the implementation of those policies. In this context special attention should be given to the introduction of innovative financial models as well as to the improvement of existing financing schemes. It is necessary to stimulate the public and private investments considering long term payback periods. Nowadays the investors faced the energy renovation of buildings with short and medium pay-back periods less than 10 years which leads to energy efficiency saving inferior to 30%. However, European targets for 2050 requires energy savings in buildings up to 80% which implies more investments and much longer payback periods, ranging from 20 to 40 years. In this context, the deep energy renovation of buildings and its financing is one the most important interventions with wide impact in energy savings.

The SUDOE methodology is a tool developed under REHABILITE project to guide public authorities and other entities during the design of an ex-ante assessment to evaluate financial instruments for energy renovation in buildings. The main goal of this document is to share and organize the methods used in REHABILITE project providing information about the ex-ante assessment process and its main elements. The ex-ante assessment process aims to provide guidance to Managing Authorities (MA) in the preparation of financial instruments (FI), supplying adequacy of the envisaged FI against an identified market failure or suboptimal investment situation and contributing to the achievement of programme and ESIF (European Structural and Investment Funds) objectives.

The SUDOE methodology supports the ex-ante assessments developed in REHABILITE project for regions in the SUDOE space and intends to constitute a standardized reference document so that any region of the SUDOE space can replicate the process and generate its own ex-ante assessment and its financial instrument for energy renovation of buildings. The contents of this document were developed in collaboration with AFI consultants that supported the elaboration of the ex-ante assessments.

Financial Instruments (FI) are an efficient way to manage resources in cohesion policy, contributing to achieve the Europe 2020 objectives. Financial Instruments provide support to investment through loans, guarantees, capital and other risk covering mechanisms, possibly combined with technical assistance, interest rate subsidies or subsidies on guarantee fees. However, beyond the advantages from the possible recycling of long-term funds, Financial Instruments should help mobilise increased public or private co-investment aimed at addressing market failures. In this regard, the structural design of financial instruments requires new experience and knowledge besides the traditional skills required for managing EU funds. The goal is to ensure that the assignment of resources is efficient and generates incentives to improve performance, including greater financial discipline in the projects being financed.

\(^1\)Table 5 in annex provides a List of ex-ante evaluations already implemented.
Given these requirements, European regulation in this current programme period (2014-2020) requires that decisions to support measures through Financial Instruments be based on an ex-ante assessment. This assessment should demonstrate the existence of market failures and the estimated level and scope of public investment needed.

The essential elements of an ex-ante assessment are defined in article 37 of regulation (EU) Nº 1303/2013 and should include two main groups of information, the market assessment and delivery and management (Figure 1).

![Figure 1](image)

**Market Assessment**

1) market failures, suboptimal investment situations, and investment needs, article 37 (2) (a)

2) added value of the financial instruments, article 37 (2) (b)

3) additional public and private resources to be potentially raised, article 37 (2) (c)

4) lessons learnt, article 37 (2) (d)

**Delivery and Management**

5) proposed investment strategy, article 37 (2) (e)

6) expected results, article 37 (2) (f)

7) provision for the update and review, article 37 (2) (g)

**Figure 1** - The main elements of an ex-ante assessment methodology for financial instruments. Source: Regulation EU 1303/2013.

The market assessment includes the following activities:

1) The analysis of market failures, suboptimal investment situations, and investment needs could be oriented to specific policy areas, thematic objectives or investment priorities and should be based in good practices methods.

2) The assessment of the added value of the financial instruments should consider the consistency with other forms of public intervention, possible state aid implications and measures to minimize market distortion.

3) The estimate of additional public and private resources to be raised by the financial instrument, considering the expected leverage effect at the level of the final recipient.

4) The assessment of lessons learnt from similar instruments and how that lesson should be applied in the future.
The delivery and management include:

5) The proposed **investment strategy** should address financial products to be offered, final recipients targeted and estimated combination with grant support.
6) The specification of the **expected results** according to the objectives defined.
7) The review of **provisions allowing for the ex-ante update** due to changes in market conditions and investment trends.

Beside the article 37 of regulation (EU) Nº 1303/2013 there are other regulatory documents that worth to be mentioned:


The European Commission's DG Regional and Urban Policy has worked with the EIB in developing a series of methodological guidelines, from an operational perspective. The goal is to support managing authorities, managing organisations and assessment teams in the process of defining and introducing Financial Instruments. In this context, FI-Compass, the platform for advisory services on Financial Instruments, provided by a partnership between the European Commission and the European Investment Bank, is an important source of information from where it worth highlighting the following documents (Figure 2):
**Description:**


**Description:**


**Description:**


**Figure 2** – Methodological guides for the design of Financial Instruments. Source: [https://www.fi-compass.eu/resources/ex-ante-assessment-summary](https://www.fi-compass.eu/resources/ex-ante-assessment-summary)
2. Instruments and evaluation methods

The design of an ex-ante assessment requires a multidimensional methodologic approach to encompass several subjects that need to be analysed in this context. Therefore, it was designed a toolbox of methodologies aiming to cover the main objectives of the ex-ante study while assuring the involvement of different stakeholders, the collection and analyses of various sources of qualitative and quantitative information and its articulation with the several activities included in the development of the ex-ante assessment (Table 1):

**Table 1 – Instruments and evaluation methods**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documental collection</td>
<td>This <em>backoffice</em> method was developed by the five SUDOE regions, to collect selected reports, regulations, technical studies, and best practices with the purpose to deep the knowledge about the several dimensions of the ex-ante assessment. Furthermore, these documents were analysed, systematised and in some cases, it was developed specific indicators.</td>
</tr>
<tr>
<td>and analysis</td>
<td></td>
</tr>
<tr>
<td>Data collection and analysis</td>
<td>This <em>backoffice</em> method was developed by the five SUDOE regions, consisted in the identification and selection of quantitative data, among other sources from national and international entities responsible for census and cadastral data, public entities responsible for public data about energy efficiency and statistical data from central banks. The information was treated and analysed according the purpose of the ex-ante studies.</td>
</tr>
<tr>
<td>Benchmarking</td>
<td>The benchmarking activity was developed for the five SUDOE regions and it was focused on the goal of collecting information about best practices that could be incorporated in the ex-ante studies. In this context it is important to highlight the work carried out under the REHABILITE project that allowed to collect more than 100 best practices to identify innovation models in policies, regulations and technical systems that could support the design of innovative financial instruments (FI).</td>
</tr>
<tr>
<td>Focus group or workshop with stakeholders</td>
<td>The focus group method was an option selected by some SUDOE regions, with the objective of gathering qualitative information from distinct groups of stakeholders and citizens.</td>
</tr>
<tr>
<td>Semi-structured interviews</td>
<td>The realization of semi-structured interviews was another option used by some SUDOE regions to collect qualitative information in order characterize the views, experiences and motivation of different entities involved in the ex-ante assessment.</td>
</tr>
<tr>
<td>Surveys to potential beneficiaries</td>
<td>The realization of online surveys is a very useful and practical option to gather qualitative information from different stakeholders, which was an option used by some SUDOE regions as a complementary method to the focus group or workshop organized. This method has several advantages, since it is a very fast and easy way to communicate with people and the information analyses of the results is very simplified.</td>
</tr>
<tr>
<td>Experts panels</td>
<td>This method synthesizes a variety of inputs on a specialized topic and produce recommendations. The application of this method requires in some situations several iterative sessions which implies more time to be applied and is also more laborious.</td>
</tr>
</tbody>
</table>
3. The SUDOE Methodology for the ex-ante market

The analyses processes of the ex-ante assessment as depicted in Figure 1, comprises two main elements, 1) the market assessment and 2) the delivery and management. The SUDOE Methodology proposes a specific approach regarding the first element. In this context, the market assessment comprises three activities. The first is a general characterization of the potential market size, the second is a SWOT analysis that will support the identification of market failures and the third phase is the funding gap calculation. The first two can be developed in parallel, but the third will only be generated upon completion of the former. Additionally, an initial consideration of macroeconomic variables is useful to contextualise the current state of play.

3.1 General information and the potential market size (demand and supply)

3.1.1 General Information

As general information, it’s worth characterising how the building sector has evolved in recent years, as well as the energy consumption and the associated costs. Furthermore, it is relevant identifying the main politically agreed public sector energy efficiency goals. Complementary, we emphasise the importance of collecting data related to projects which have already been implemented and might be similar to those supported in the future, in addition to other data related to similar schemes already in place.

It is recommended that this characterisation include the following information:

Characteristics of current building stock:
- Real estate cadastre data analysis;
- Population and housing data analysis;
- Population and Housing Census (last data point compared to previous census);
- Population and Dwelling Census (last data point compared to previous census).

Trends in Energy Consumption (ktoe) for the Residential and/or Service Sector.
- Final energy consumption by sectors, mainly focusing on residential data and/or service sector data and energy sources.

Cost of energy:
- Evolution in euros per kWh.

Political goals and commitments
- National Energy Efficiency Action Plans defined according to Energy Efficiency Directive2:
  - National indicative targets towards 2020 and beyond;
  - Forecast final energy savings according to several sectorial action lines.

• Regional Energy Efficiency Action Plans (if any) defined according to Energy Efficiency Directive:
  National indicative targets towards 2020 and beyond;
  Forecast final energy savings according to several sectorial action lines (annual and additional - ktoes and €).

• Examples of any activity already carried out in the area of interest:
  Data from energy audits already carried out;
  Data from well-known data platforms such as E3P\(^3\), DEEP\(^4\), SEED\(^5\), etc.
  Data on potential energy savings (ktoe and euros) obtained from Energy Efficiency toolkits such as EEB\(^6\), Building Owners\(^7\), Danish Energy Agency\(^8\), WBCSD\(^9\), etc., or your own databases.

**The collection and analysis of data and other documents provides a detailed context**
The evaluation methods used for the development of this task were Data Collection and Analysis for the treatment of statistical information and Documental Collection and Analysis for the review of economic and financial studies and reports at the regional and national levels.

### 3.1.2 Market size – Demand-side

The analyse of the potential market size in relation to demand-side requires a characterization of demand regarding energy efficiency in the finance of building projects and comparing to other regions. The detailed analysis can be done by observing the following elements:

**Potential market size:**
- Number of public buildings in the area concerned - data related to actual consumption of heat/cooling/hot water consumption;
- Number of residential multi-apartment buildings in the area concerned - data related to actual consumption of heat/cooling/hot water consumption (at least a sample of them);
- Number of commercial use buildings in the area concerned - data related to actual consumption of heat/cooling/hot water consumption (at least a sample of them);

Ultimately, identifying the potential demand for energy efficiency projects in the building sector.

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\(^3\)https://e3p.jrc.ec.europa.eu/
\(^4\)https://deep.eefig.eu/
\(^5\)https://www.energy.gov/eere/buildings/standard-energy-efficiency-data-platform
\(^6\)http://www.eeb-toolkit.com/
\(^7\)http://www.buildingtoolkit.org/
\(^9\)http://wbcsdpredictions.org/project/energy-efficiency-toolkit-for-corporate-buildings-version-1/
Demand for external financing in the target areas:
- Identification of project profile by size, economic sector, previous capital structure, credit rating, etc.
- Explanation of current practices to finance these types of projects.
- Analysis of unmet demand: financing shortfalls, main reasons market players reject financing for these types of projects, main reasons agents do not access existing financial products.

Qualitative information is key for a deep characterization
Data gathering on the previously mentioned variables is not always easily available, so the evaluator will need not only to check previously mentioned sources (subsection 3.1.1), but also carry out semi-structured interviews with key stakeholders and agents. Focus groups could be also an alternative. The purpose of these interviews is to explore the views, experiences, beliefs and/or motivations of individuals and agents on specific issues. Their views will provide a ‘deeper’ understanding of the current situation which quantitative research cannot provide. They are also useful in generating a more nuanced understanding of participants’ experiences.

A possible outline for the interviews or focus groups could be as follows:

Table 2 – Potential framework for a “Regional Public Administration” interview

- Objectives to be achieved with ESI Funds in Energy Efficiency (EE) sector (if applicable).
- Strategic priorities as a public entity
- Current tools available for investing in EE
- Overview of prior experience of EE projects financed by European funds
- What type of demand does the public entity receive in relation to EE project financing?
  - Is the demand for funding covered?
  - What type of projects are currently funded?
  - What type of entities receive funding?
- Has there been any collaboration with private or public financial institutions? How was it structured?
Table 3 – Potential framework for a likely “applicant for funds” interview focused on building/dwelling owners

- Do you believe your EE activity has been below potential in recent years? If so, what has been the main limiting factors?
- What has been your relationship with financial institutions in recent times? Have you had problems accessing bank finance?
- If you have had difficulties obtaining funding, what do you consider to be the main reason? (General economic environment, scarcity of own resources, credit history, doubts about the projections for your project, willingness of the entities to provide funding credit)
- Which factors are most important for obtaining private finance for your EE project? (applicable interest rate, term of the transaction, adjustment of the amortization to project earnings/savings, required guarantees...)
- Would public sector support facilitate increased access to bank financing for your project?
- If so, what is your preferred option? (Subsidised interest rates, provision of guarantees, capital inflow, etc.)
- Aside from bank loans, where else would you consider seeking funding for your EE projects?
- Have you received funding from a public entity in order to carry out any EE project before? If so, which entity? Under what conditions? Was it reimbursable? What was the objective of the application? What were the positive and negative aspects of your experience?

Individual questionnaires or surveys for a specific target are important evaluation tools
Occasionally, an evaluator might deem a survey to be a better and quicker approach to accessing primary information from external providers. However, qualitative information obtained through a direct questioning approach is much more sophisticated and useful in developing a strategy for financial instruments.

3.1.3 Market size – Supply-side

The financing needs of EE project owners should also be analysed. This involves obtaining information on volume and conditions under which funding is provided. This can be done by investigating the following issues:

- Identification of the main sources of financing in the target sector (s): financial and non-financial actors providing financing to EE projects, financial products on offer, requirements for access to finance, etc.
- Coverage of risks associated with financing: leverage, credit risk, technological risk, etc.
- Public financing in the target sector(s): analysis of financing provided through public instruments, including instruments financed by ESI Funds (type of operations, amount, economic sector, company size, geographical location, use of instruments such as subsidies, debt, etc.).
Semi-structured interviews allow a comprehensive analysis of the financial sector
Data gathering should be carried out through semi-structured interviews with private and public financial intermediaries. A direct questioning process should be preferred in order to obtain relevant information on the views, opinions and rationale of the financial sector involved in EE project funding.

A possible outline for the interviews could be as follows:

Table 4 – Potential framework for a “financial intermediary” interview

- How do you apply financing provision to EE projects (stressed, stable, relaxed)? What is the outlook for the next few years?
- What are the main factors that shape your credit policy?
- Has there been demand for energy efficiency projects funding? Does demand vary depending on the type of applicant?
- If an applicant requests a financial product that you don't provide, what approach do you take? Do you redirect them to other financial agents with whom you collaborate (venture capital, participatory loans, banks, etc.)?
- What percentage of demand do you consider to be currently unmet? Why is it?
- If a public entity were to provide support in bridging the market gap on EE project development, which financial instrument would be most appropriate to generate a greater multiplier effect? Subsidised interest rates? Guarantee contribution? Others?
- From previous experience collaborating with public entities, what aspects should be improved in order to provide a better service to EE project owners?
- What public or private initiatives could be taken into account to improve funding for this type of project?

Table 7 in annex provides a List of Potential stakeholders to be contacted.

3.2 SWOT ANALYSES

SWOT (Strengths, Weaknesses, Opportunities and Threatens) analysis is a way to summarise the preceding analyses and use them for developing a strategy. It is based on the idea that a policy will be successful if its internal characteristics (strengths and weaknesses) are suitable for the external environment (opportunities and threats). The fundamental role for strategic planning is ensure that this fit applies in the long run.

Based on the information gathered above, a SWOT matrix related to EE project development should be constructed in the target sector(s), which will include the following information for the demand and supply of finance for EE projects:
3.3 Funding gap calculation

The funding gap calculation is based on the activities previously described, the characterization of the potential market size (section 3.1) and the SWOT analyses (section 3.2). The identification of market problems is a result of an integrated evaluation of the market supply and the demand needs. Analysing the gap between the demand and supply will allow to identify market failures or the suboptimal investment situations (Figure 4). A market failure is non-functioning aspect of the market that results in an inefficient allocation of resources that implies an underproduction or overproduction of certain services or goods. The suboptimal investment situations are verified when exists underperformance of investment activities or when this investment is not enough to achieve certain policies’ objectives.

Validate the results and create awareness using participatory methods

In order to reinforce the aforementioned analysis, it is proposed to organize a validation workshop. The aim is to complete and validate findings obtained during the fieldwork and analysis. It will also help to identify funding gaps that will come out from the ex-ante evaluation process. An initial presentation should be done by the evaluation team. They should present the main strategic and operational conclusions found during the ex-ante evaluation process. Subsequently, a roundtable will be held. All participants will be able to communicate their points of view on the aspects set out in the presentation. A final presentation and debate should be held on the market failures identified and potential solutions to tackle them from a financial instrument point of view.

The organization of a workshop is advantageous to collect extra information regarding the needs of potential final beneficiaries and financial intermediaries. Additionally, it helped to raise attention to coming public initiatives in order to align stakeholder’s objectives and expectations. This is key to successful development of future Financial Instruments to be implemented.
Based on the analysis developed, and in order to provide a quantitative estimate of funding gaps, an exercise to project additional public financing needs, should be carried out, based on a series of assumptions. These may be investment targets set out in official public policy documents or benchmarking with other financial markets in the region or country, as deemed appropriate.

The following are some methodological options that could be applied in order to estimate funding gaps:

- Quantification of funding gap from baseline (no policy change) and public objectives.
- Benchmarking in relation to national or EU market.

The choice of approach will depend on data availability and the market failures identified. The result of the quantitative estimation of funding gap should be solid and reliable figures of the financing needs for each target area of action.

**Figure 4** – Workflow to assess the evidence of market failures or suboptimal investment situations. Source: EIPA-Ecorys-PwC training presentation

**The funding gap calculation is crucial to design and dimension the financial instrument**

The quantification of the funding gap is a result from the market failure and suboptimal investment assessment. This is a crucial task to define the size of the support scheme that should be lower that the investment needs. In the context of the REHABILITE project the results of the funding gap calculation allowed to specify the regional targets and to define the strategies.
4. The SUDOE guidance of contents for the ex-ante study

The previous methodology presented was structure in order to provide a short guidance of contents, as following:

<table>
<thead>
<tr>
<th>SECTION</th>
<th>TITLE/ RECOMMENDATIONS</th>
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<tbody>
<tr>
<td>1</td>
<td>CONTEXT ANALYSIS OF POTENTIAL MARKET SIZE</td>
</tr>
</tbody>
</table>
|         | This section should include a general overview of building stock related data, which should help to contextualize the size of the building stock and its evolution. Beside that it should include data related to energy consumption trends and the cost of energy. An identification of already set up at national and regional level related to energy efficiency in building sector or other related issues. Any forecast data is welcome as a potential scenario to be compared with business as- usual one. Finally, it is useful to include any other data related to energy efficiency in building that might be relevant for quantitative calculation of “funding gap” such us:  
  • Data for a sample of energy audits;  
  • Data from data platforms;  
  • Data of potential savings according to different type of projects from theoretical toolkits; |
| 2       | ANALYSIS OF FINANCIAL MARKET SITUATION IN RELATION TO ENERGY EFFICIENCY INVESTMENT |
| 2.1     | Analysis of demand side of energy efficiency projects |
|         | This sub section should include an identification of the issue to be analysed. It can be related to all kind of buildings or just those related to public owned, multi-apartment ones, commercial use ones or a combination of those. The ex-ante should include data that helps to contextualize the size of this subsector (if not included in prior subsection) such as for example its evolution, data related to current energy consumption. It should be compared against a selected benchmarking (national average, EU average, other sector average...). In relation to funding demand towards energy efficiency, ex-ante should include information related to previous projects and explain it in terms of energy savings and investment costs and financial savings. It should keep clear what current practices are about, how financing needs are met and which percentage are unmet. Finally, a reasoning of financial barriers that energy efficiency project encounter would be a useful conclusion for this subsection. |
### 2.2 Analysis of supply-side of energy efficiency projects

This subsection should include information from the financial private institutions point of view. Either from quantitative data or qualitative information gathered, the ex-ante needs to identify who is currently providing financial support to EE projects, the type of support, reimbursable conditions and type of projects considered.

Financial institutions usually request some type of risk coverage, which needs to be identified in this section apart from their consideration about the risk associated to this type of EE projects.

Finally, the subsection needs to tackle the current availability of public funding towards EE projects either reimbursable or not, at EU, national, regional and local level.

### 3 SWOT ANALYSIS

SWOT is an acronym, standing for strengths (S) and weaknesses (W) of the organisation, and opportunities (O) and threats (T), this case study applied to the financing energy efficiency market. It is a way to synthesize preceding analyses and use them for developing a strategy.

The main steps involved:

- **Step 1.** SWOT is interpreted in relation to objectives of the ex-ante study.
- **Step 2.** Identifying external factors: opportunities and threats (cannot be controlled by the decision-makers).
- **Step 3.** Internal analysis of strengths and weaknesses (under the control of the decision makers).
- **Step 4.** Brief description of each external and internal factor.

### 3.1 Validation workshop

A brief description of the workshop procedure and conclusions is recommended to be included in this section.

### 4 FUNDING GAP CALCULATION

#### 4.1 Identification of market failures

Based on the fieldwork, market failures have to be identified, for example asymmetric information, adaptive preferences, risk aversion, path dependence or lack of leadership. Those type of market failures usually entail lack of financing new projects, less rehabilitation projects, lack guarantees for project developers, financing issues for ESCOs, or ESCOs shortage of capital. There might be others, it depends on conclusion obtained from previous analysis.

The identification of market failures is a key requirement, stipulated by EU legislation, for the definition of Financial Instruments. The existence of suboptimal investment situations that justify the implementation of such Instruments must be demonstrated.
### 4.2 Funding gap calculation

Depending on market failure and data availability, the funding gap calculation will be based on one methodology or another.

1. Identification of a quantitative EU/national/regional objective and of the level of investment required to reach it;
2. Trend analysis of the existing investment volumes, including already existing promotional schemes at all levels (if any);
3. Estimate the cost of achieving a unit of the target (project) and, as a result, the level of investment needed to achieve it.
4. Calculation of the regional investment gap as the difference between the level of investment required to reach the target and the current level according to number of units needed.

### 5 Lessons learned from previous and current experiences

The purpose of conducting lessons learnt is to capture the knowledge acquired during activities as part of a continuous improvement principle. The ex-ante assessment will contain:

- Identification of existing Financial Instruments co-financed using ESI funds
- Identification of other forms of reimbursable support, private and public
- Energy efficiency projects
- Identification of other public non-reimbursable support offered to EE projects development

### 6 General/sectorial/priorities identification and coherence

### 7 Proposal of financial instruments for energy efficiency

### 8 Proposal of management structure of FI suggested

### 9 Financial instrument Nº1

- Main characteristics. Investment strategy
- Leverage and value added
- Overlap or complementarity analysis with already existing EE for building funding lines
- Public resources and additional private resources
- Indicators, results and execution expected
- State aid preliminary analysis framework for financial instrument and non-repayable aid combination (if required)

### 10 Financial instrument Nº (2, 3, 4, …)

### 11 Provisions allowing the review of the ex ante evaluation
5. Lessons learned from REHABILITE partners

The development of the ex-ante studies for the five SUDOE regions under the REHABILITE project followed the same methodology although each SUDOE region found challenges and opportunities that are worth mentioning. To evaluate the design process of the ex-ante studies developed for each SUDOE region, each REHABILITE partner was interviewed and the main results are summarized below:

1. Difficulties related with data collection and information access

Three of the five regions/REHABILITE partners, mentioned problems to obtain detailed data to characterize the existent building stock and its energy performance. While the region of Extremadura in Spain mentioned specific problems to obtain data about apartments and dwellings built before 1980, the region of Nouvelle-Aquitaine in France refers difficulties to acquire energy efficiency information at the level of individual buildings. The region of Lisbon in Portugal referred the issue of dealing with statistical information from census and their periodicity of update, 10 years. Therefore, it would be important to complement this information with more regular data specifically in what concerns the building stock characterization, urban rehabilitation activity, the socio-economic and demographic variables. Regarding the energy performance of the building stock, it was mentioned the lack of public information about their energy performance and energy consumption.

Several REHABILITE partners, also referred barriers to obtain detailed information from financial institutions and other stakeholders (e.g. constructions companies, energy services companies, community owners). In some cases, stakeholders and some financial institutions are poorly informed about energy efficiency market, in other cases the entities are not very open to collaborate, sharing information.

2. Main achievements

The Involvement of regional and local authorities and the opportunity to create awareness among policy makers were the aspects highlighted by all REHABILITE partners responsible for the ex-ante studies. While the REHABILITE partners responsible for the ex-ante for Extremadura in Spain, emphasized the collaboration of the regional government, the partner from Navarra in Spain mentioned the opportunity to inform public authorities about the quantification of dwellings with refurbishment needs.

The partners involved in the study for Nouvelle-Aquitaine in France and the partners of the study for the region of Lisbon in Portugal, stressed the opportunity to confront different stakeholders with different visions and needs. The organization of workshops and focus group in each region were very successful and allowed to create awareness about the importance of energy efficiency in urban rehabilitation. For the specific case of Lisbon, the participatory activities were guided to identify major opportunities and barriers to overcome regarding a set of financial instruments already implemented in Portugal, as it is the case of the recently released financial instrument for urban rehabilitation - IFRRU.
3. The engagement level with public authorities

Overall the engagement with public authorities was fruitful and the collaboration was effective in several stages of the ex-ante studies. For example, the partners responsible for the ex-ante for Extremadura, expressed the deep collaboration received from the regional government and public companies and their full support to obtain a high-quality ex-ante study. However, some problems were pointed regarding the delay to obtain responses to surveys, mainly due to internal management issues. Another important collaboration from public authorities mentioned by all the partners, was their participation in the local workshops and focus groups. These activities were crucial to explain the purpose of the study and to discuss with regional and local governments their specific needs.

The Financial Instrument as a customized tool to support each SUDOE region

One of the most important aspects recognised by public authorities from SUDOE regions was the importance of creating ex-ante assessments that could support financial instruments adapted to the needs of each region.

4. Additional information

The REHABILITE partners identified further improvements that could help the development of future ex-ante studies for the design of new financial instruments in other regions.

Regarding the planification of the ex-ante study, the period allocated to data collection and to organize meetings with stakeholders revealed to be insufficient. It would be important for further studies allocate enough time considering the period of response by the public entities and other stakeholders.

Different stages of implementation of financial instruments between the five SUDOE regions determined variable focus of REHABILITE partners during the ex-ante study. Since the three Spanish SUDOE regions don’t have yet implemented any financial instruments for energy renovation, their work was mostly focused on the identification of market failures and creating awareness among public authorities about the benefits of energy efficiency in urban renovation.

The regions of Nouvelle-Aquitaine in France and Lisbon in Portugal already have financial instruments and other funds supporting energy renovation. Therefore, the main focus of the work developed was to analyse the existent instruments and understand if they fill the market failures. In this context it is important to understand how to leverage its implementation, identifying the real barriers and possible solutions. This type of work was developed bringing together stakeholders during local workshops and focus groups.
6. Conclusions

The SUDOE methodology is a guidance material produced by REHABILITE project that systematizes the procedures to develop an ex-ante study focused on energy efficiency and renovation in the building sector. The main objective of this document is to support the MA in the preparation of a FI. This methodology also aims to help MA to identify their own strategies and targets, learning with REHABILITE experience. The most relevant advises resulted from the learnings accomplished with the current project are related with the need to overcome the lack of information regarding the building stock and its energy performance, to increase the collaboration with financial institutions and improve their level of information about energy efficiency market in each region. Another important conclusion taken from the implementation of this methodology is the positive impact obtained regarding the response and engagement of public authorities during the process. In fact, the application of participatory approaches revealed to be the right approach to create awareness among MA and other stakeholders. Behind these common challenges, each region should accommodate and analyse their particular goals and opportunities in order to develop a robust and efficient ex-ante assessment procedure. In this sense the SUDOE methodology provides guidance to help regions to adequate and measure funding sources and the investment needs as well as to evaluate aggregated demand-side and the portfolio of beneficiaries.
Acknowledgements

The authors acknowledge the interviews from REHABILITE partners responsible for the development of the five ex-ante studies that supported the chapter 5 of this report, *Lessons learned from REHABILITE partners*. We also acknowledge the work developed by AFI Consultants during REHABILITE project and their support regarding the definition of a common project methodology for the calculation of the suboptimal investment situation and analysis of market failures.
References


<table>
<thead>
<tr>
<th>Terms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>Is mostly used when referring to an ownership interest in a business, especially when considered as the right to share in future profits or in appreciation in value of the business. Is also used to indicate funds contributed by the owners or stockholders of a business compared to funds borrowed from third parties (e.g. banks, investment funds) (FI-Compass, 2014).</td>
</tr>
<tr>
<td>ESI Funds</td>
<td>European Structural and Investment Funds for the programming period 2014-2020. This includes: European Regional Development Fund (ERDF), Cohesion Fund (CF), European Social Fund (ESF), European Agricultural Fund for Rural Development (EAFRD), and European Maritime and Fisheries Fund (EMFF).</td>
</tr>
<tr>
<td>Ex-ante assessment</td>
<td>As in Article 37 (2) of the common provision regulation. MS/MA are required to conduct ex-ante assessments before supporting financial instruments, including: rationale/additionality against existing market gaps and demand/supply, potential private sector involvement, target final recipients, products, and indicators (FI-Compass, 2014).</td>
</tr>
<tr>
<td>Financial Instruments (FI)</td>
<td>As in Article 2 (11) of the CPR, the definition of financial instruments as laid down in the Financial Regulation shall apply mutatis mutandis to ESI Funds, except where otherwise provided in the CPR. In this context, financial instruments means Union measures of financial support provided on a complementary basis from the budget to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk sharing instruments, and may, where appropriate, be combined with grants (FI-Compass, 2014).</td>
</tr>
<tr>
<td>Funding gap</td>
<td>Funding gap is a result from the market failure and suboptimal investment assessment.</td>
</tr>
<tr>
<td>Managing Authorities (MA)</td>
<td>Managing Authority, as defined in the Regulations regarding ESI Funds (FI-Compass, 2014).</td>
</tr>
<tr>
<td>Terms</td>
<td>Description</td>
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<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Market failures</td>
<td>Non-functioning aspects of the market which result in an inefficient allocation of resources and entail the underproduction or overproduction of certain goods and services. This analysis allows the Managing Authority (MA) to determine the size of the investment gap to be filled by the FI. (EIPA-Ecorys-PwC, 2014)</td>
</tr>
<tr>
<td>Retrofitting</td>
<td>For buildings, this means making changes to the systems inside the building or even the structure (the envelope) itself at some point after its initial construction and occupation (Vanstraelen, et al., 2015).</td>
</tr>
<tr>
<td>Suboptimal investment</td>
<td>Underperformance of investment activities, or a situation where the existing investment activity is insufficient to achieve a policy objective. This analysis allows the Managing Authority (MA) to determine the size of the investment gap to be filled by the FI.</td>
</tr>
<tr>
<td>Urban renovation / rehabilitation</td>
<td>A range of actions aimed at sustainable renewal, rehabilitation, redevelopment and/or development of city areas, which may include area based and city wide initiatives (FI-Compass, 2014).</td>
</tr>
</tbody>
</table>
## Table 5 – List of ex-ante evaluations already implemented

<table>
<thead>
<tr>
<th>Scope of application</th>
<th>TAGS</th>
<th>Title and reference</th>
</tr>
</thead>
</table>
| EU level evaluation  | • SME initiative  
                     • SME financing  
                     • Enhance SMEs’ credit availability  
                     • Uncapped portfolio guarantees and portfolio securitisation | Commission Staff Working Document – Ex-ante assessment of the EU SME Initiative (European Commission, 2013) |
| Slovakia – case study| • Several managing authorities  
                     • Stakeholder cooperation  
                     • Fund of Funds  
                     o Transport Infrastructure and Energy Production Fund;  
                     o Energy Efficiency in Buildings Fund;  
                     o Waste and Water Management Fund;  
                     o Municipal and Urban Development Fund;  
                     o SME Financing Fund;  
                     o Social Economy Fund  
                     • Soft loans, guarantees, equity/quasi-equity, interest subsidy risk-sharing, microfinance | Ex-ante assessment for financial instruments in Slovakia (FI-Compass - European Investment Bank, 2016) |
| Scotland-case study  | • SMEs financing needs  
                     • Consultation with stakeholders  
                     • Flexible investment strategies through Fund of Funds  
                     • Equity, loans and microfinance | Ex-ante Assessment of Financial Instruments (The Scottish Government, 2014)  
Ex-ante assessment for financial instruments in Scotland (FI-Compass - European Investment Bank, 2016) |
<table>
<thead>
<tr>
<th>Scope of application</th>
<th>TAGS</th>
<th>Title and reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish evaluations</td>
<td>• SMEs financing</td>
<td>Islas Baleares ex ante evaluation of Financial Instrument</td>
</tr>
<tr>
<td></td>
<td>• Several funding gaps, but one financial instrument proposed</td>
<td>(Red2Red, 2016)</td>
</tr>
<tr>
<td></td>
<td>• Start-ups investments through co-investment Fund</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• R&amp;D investment and ICT companies</td>
<td>Navarra ex ante evaluation of Financial Instrument</td>
</tr>
<tr>
<td></td>
<td>• Risk Capital fund</td>
<td>(CDI consulting, 2015)</td>
</tr>
<tr>
<td></td>
<td>• Horizon 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• In-house management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SME funding for R&amp;D and investment projects</td>
<td>Castilla y León ex ante evaluation of Financial Instruments</td>
</tr>
<tr>
<td></td>
<td>• Guarantee Funds</td>
<td>(ECORYS, 2016)</td>
</tr>
<tr>
<td></td>
<td>• EIB based governance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Market failures: asymmetric information; adaptive preferences and</td>
<td>Andalucía ex ante evaluation of Financial Instruments</td>
</tr>
<tr>
<td></td>
<td>risk aversion; externalities and suboptimal provision of financial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>resources to specific sectors.</td>
<td>(AFI Consultores, 2016)</td>
</tr>
<tr>
<td></td>
<td>• Suboptimal investment: financing on private R&amp;D; insufficient</td>
<td></td>
</tr>
<tr>
<td></td>
<td>development of venture capital; insufficient guarantees for SMEs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to access credit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• In house, external and EIB based management though a Fund of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Funds governance</td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td>• Demanding information needs</td>
<td>Portugal ex ante evaluation of Financial Instrument.</td>
</tr>
<tr>
<td>evaluations</td>
<td>• Stakeholders engagement</td>
<td>Direct business support.</td>
</tr>
<tr>
<td></td>
<td>• SMEs Sustainable investment</td>
<td>(Augusto Mateus &amp; Associados, 2015)</td>
</tr>
<tr>
<td></td>
<td>• Equity, quasi-equity or debt capital or other risk-sharing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>instruments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Regeneration and renewal of urban areas</td>
<td>Portugal ex ante evaluation of Financial Instruments.</td>
</tr>
<tr>
<td></td>
<td>• Broad spectrum of usage</td>
<td>Regeneration and revitalization of urban areas.</td>
</tr>
<tr>
<td></td>
<td>• Counter-guarantee funds and guarantees</td>
<td>(Augusto Mateus &amp; Associados, 2015)</td>
</tr>
<tr>
<td></td>
<td>• Combination with grants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Previous JESSICA initiative experience</td>
<td></td>
</tr>
<tr>
<td>Scope of application</td>
<td>TAGS</td>
<td>Title and reference</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **Portuguese evaluations** | • Selection of several methodologies to data collection  
• Broad range of FIs  
• Complementary role to other public interventions  
• Fund of funds governance | Portugal ex ante evaluation of Financial Instruments. Financial instruments for energy efficiency and efficient of water and waste management. (CEDRU, 2015) |
|                      | • Combination of methods and information sources  
• No past data and no credible information and low level of participation from financial private intermediaries  
• Qualitative dimension of market failure | Portugal ex ante evaluation of Financial Instruments. Social innovation, micro-entrepreneurship and self-employment creation and credit support to higher education students. (Quaternaire, 2015) |
| **French evaluations** | • Public and private sector stakeholders  
• Urban Development Fund  
• Financial guarantees | The implementation of Financial Instruments to support urban development in the Ile-de-France region 2014-2020. (European Investment Bank, 2015) |
|                      | • SME financing needs  
• Support for projects related to efficiency and energy transition  
• Stakeholders engagement  
• Broad range of FIs  
|                      | • Multifunding Financial Instruments  
• Broad range of FIs  
• Stakeholders engagement | Ex-ante evaluation mission of the financial instruments of the operational programs 2014-2020 in the Franche-Comté region |

Source: Definition of a common project methodology for the calculation of the suboptimal investment situation and analysis of market failures, internal report developed by AFI Consultants, May 2017, REHABILITE project.
### Table 6 – Example of SWOT Analysis - region of Extremadura, Spain

<table>
<thead>
<tr>
<th><strong>Positive Factors</strong></th>
<th><strong>Internal Factors</strong></th>
<th><strong>External Factors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong Points</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Financial Sector strengthened due to the crisis overcoming. Looking for new business ways.</td>
<td></td>
<td>• More favourable legal context which strengthens the homeowner's associations role to negotiate financial instruments against banking entities in order to undertake common projects in the field of energy efficiency.</td>
</tr>
<tr>
<td>• Energy Services companies (ESCO’s) consolidated and with some experience on Energy Renovation Sector.</td>
<td></td>
<td>• The renovation of buildings constitutes a market niche for the banking sector and ESCO’s.</td>
</tr>
<tr>
<td>• Neighbourhood association legal recognition to be able to undertake actions jointly.</td>
<td></td>
<td>• Expansion of financial products market for renovations.</td>
</tr>
<tr>
<td>• European aids and programmes betting on energy efficiency that contribute to renovation projects and the searching of financial instruments to achieve these aims.</td>
<td></td>
<td>• The new funding lines for energy efficiency projects at European, national and regional level, reinforce the investment capacity and facilitate projects' procedures.</td>
</tr>
<tr>
<td>• Political agreements of public administrations to improve buildings' efficiency and reduce their CO2 emissions.</td>
<td></td>
<td>• Technological innovations make renovation actions more efficient and shorten investment repayment periods.</td>
</tr>
<tr>
<td>• High demand potential to carry out energy refurbishment actions in the residential sector.</td>
<td></td>
<td>• Technical advice will allow homeowners associations to identify the best technical solutions and the best financing options.</td>
</tr>
<tr>
<td>• Clear and simple definition of procedures to be followed by banks and final users, making the financial instrument easy to understand and to be used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Factors</td>
<td>Internal Factors</td>
<td>External Factors</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td></td>
<td><strong>Threats</strong></td>
</tr>
<tr>
<td>• Banking sector limited presence in homeowner's associations renovation actions, as well as a financial infrastructure which is little developed for this type of operations.</td>
<td>• Financial crisis and lack of credit opportunities for the development of energy refurbishment activities.</td>
<td></td>
</tr>
<tr>
<td>• Homeowners associations' ignorance about the possibilities offered in energy efficiency to carry out these kinds of actions.</td>
<td>• Elimination of operative lines or programmes that finance projects.</td>
<td></td>
</tr>
<tr>
<td>• Financial products offered by banks are not specialized for energy refurbishment actions.</td>
<td>• Policy changes that paralyse or draw out initiative processing.</td>
<td></td>
</tr>
<tr>
<td>• Homeowners associations’ lack of confidence on ESCOs, what makes feasible economically projects be rejected.</td>
<td>• Banking sector lack of interest to commit funds due to the fact that companies are significantly reducing their profits.</td>
<td></td>
</tr>
<tr>
<td>• Great investments required associated to long term benefits.</td>
<td>• Reduction in public investment destined to energy renovation caused by austerity policies.</td>
<td></td>
</tr>
<tr>
<td>• Homeowners associations´ enormous difficulty in coming to an agreement to carry out any procedure, taking into account their diverse casuistry (age, purchasing power, ...).</td>
<td>• Long process to define and launch a new financial instrument with public aids.</td>
<td></td>
</tr>
<tr>
<td>• Banking sector’s mistrust in real state because of the high defaulting rates during the crisis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Excessive dependence on banking funding to carry out these projects.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Excessive long administrative processing of public aids.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Assistance payment or concession of public loans once the action has been made, what entails the initial necessity of funding of a 100%. The payment of grants or granting of public loans are made once the works have been finished, which entails an initial need for 100% financing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Complexity to determine the most advantageous aid or funding option.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impossibility to combine different grant programmes, due to aids incompatibility or to different approval dates.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Exante study for Extremadura building sector, AGENEX, 2018 (REHABILITE project).*
Table 7 – List of Potential stakeholders to be contacted

- Representatives from the Public sector:
  - ERDF Management Authorities or Intermediate Bodies.
  - Energy Policy Departments.
  - Building Policy Departments.
  - Other public bodies related to energy efficiency and building policy implementation.

- Representatives from EE project developers:
  - ESCOs companies or associations related to them.
  - Building owners and State Agents or associations related to them.
  - Energy related consultants or auditors.
  - Other private entities related to energy efficiency projects.

- Representatives from Financial Sector
  - Traditional banks.
  - Mutual Guarantee Companies or other mutual risk fund managers.
  - Public Investment or Economic Development Agencies.
  - Investment managers running themed funds dedicated to energy efficiency.
  - Other financial intermediaries related to energy related projects.

Source: *Definition of a common project methodology for the calculation of the suboptimal investment situation and analysis of market failures, internal report developed by AFI Consultants, May 2017, REHABILITE project.*