



**TURNKEY  
RETROFIT**



## D1.3 TURNKEY RETROFIT Specifications



<b>Project Acronym</b>	Turnkey Retrofit
<b>Project Name</b>	TURNKEY solution for home RETROFITting
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<b>Project Duration</b>	30 months (starting 1 June 2019)
<b>Website</b>	<a href="http://www.turnkey-retrofit.eu">www.turnkey-retrofit.eu</a>

<b>Deliverable No.</b>	D1.3
<b>Dissemination Level</b>	Public
<b>Work Package</b>	WP 1
<b>Lead beneficiary</b>	EP
<b>Contributing beneficiary(ies)</b>	CSTB, Operene, NUIG, IGBC, ANERR, TECNALIA
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<b>Date</b>	15/03/2020
<b>File Name</b>	TR_D1.3_EP_15_03_2020_FV



*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 839134.*

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## FOREWORD

The Turnkey Retrofit project develops an integrated home renovation service, firstly operated in France, Ireland and Spain. The service is developed as a homeowner-oriented renovation journey, aiming to transform the complex and fragmented renovation process into a simple, straightforward and attractive process for the homeowner. It comprises initial technical and behavioural diagnosis, technical offer, contract development and agreement, structuring and provision of financial support, as well as the on-site coordination of works and quality assurance. In short, the homeowner is offered tailor-made solutions and is guided through the whole renovation process. The service will be accessible through a user-friendly digital platform and will address drivers of building renovation that go beyond a wish to reduce energy bills and increase asset value, such as home improvement, increased comfort, improved health and quality of life.

## INTRODUCTION

The integrated home renovation services currently operated in France by EP and OPERENE are targeting different key players in the construction value chain and the renovation process, for these two services has been designed according to their customer decision-making logic (homeowner for single-family house, board of co-owners for multi-family building).

Drawing on its experience with its existing webservices and tools, EP has redesigned its platform in order to :

- Adapt the business model to increase the cost efficiency of the platform;
- Integrate the key findings and areas of improvement identified in Task 1.1, to increase the attractiveness of the platform and the conversion rate between the first login onto the platform and the actual works.

This platform, called Heero, will be launched by mid-April. It will gather :

- A simplified version of the single-family houses customer journey (fully online)
- Additional bricks for the multi-family buildings (moke-up version).

Based on the work done in Tasks 1.1, 1.2 and 2.1, including meetings that gathered the partners since the beginning of the project, several additional bricks have been identified as “top priority” for everyone and are being developed to be plugged to main webservice.

D1.2 and its annexes gives a description of Heero and the full list of the additional bricks that have been identified.

Ideally, all the bricks should be developed and adapted to provide full customer journeys for each country. But this task and the associated estimated development effort must be challenged against:

- Resources within TURNKEY project
- Technical requirements and limits.

The first step of the Implementation phase of the project (before we start to adapt Heero and the additional bricks) is to assess the technical constraints. Then we will refine the priority and plan the development effort accordingly.

### *D1.3 – TURNKEY RETROFIT Specifications*

In order to do so, this deliverable gives the functional and non-functional requirement specifications for the Implementation of the TURNKEY RETROFIT service in Spain and Ireland (methodology and digital platform).

These specifications include technical aspects (required data and their availability) but also economic, legal and cultural aspects.

## 1. DEVELOPED FEATURES AND DATA REQUIREMENT

This section contains the complete list of the available features with the associated mandatory data (described in part 2 of this document).

A feature is a service that fulfils a stakeholder need

### 1.1. Energy assessment

**Goal:** Help the homeowner to identify the best retrofit roadmap for his home based on its energy assessment, called “Smartdiag”.

**Target:** Homeowner (Feature not available for multi-family buildings)

**Process:** A form about his house is submitted to the user. Questions concern the heating system, windows types, year of construction, etc. but also the use of the house as the number of adults, the number of children, internal set temperature, etc.

Then, Smartdiag establishes a link between the Home-Owner address and external data, such as climatic areas, cadastral maps, etc. At the same time, it also uses the main technical characteristics of the materials to complete a global thermal model of the house.

Smartdiag considers that technical data match the year of construction and the construction standards.

**Inputs:**

From the user (homeowner):

- Form’s answers (between 15 and 20 questions)

From external contributors:

- Climatic data
- Cadastral data
- Technical data based on construction standards
- Cost of work

**Outputs:** Global scoring of the house (EPC like) and three roadmaps (“to start”, “to go further”, “to start a complete retrofit project”)

- Energy costs (electricity, gas, fuel, wood)
- List of works

### 1.2. Retrofit work costs assessment

**Target:** Homeowner and potentially co-owners

**Process:** Questions concerning the selected retrofit work are submitted to the user. According to his answers, an estimation of the work and associated subsidies is then generated.

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#### *Inputs:*

From the user (homeowner):

- Form's answers

From external contributors:

- Cost of works
- Associated subsidies

*Outputs:* Estimated cost of retrofit works and associated subsidies

At the end of this process, the user is connected to a network of professionals.

## 1.3. Finance retrofit work

*Target:* Homeowner and potentially co-owners

*Process:* Questions concerning the selected retrofit works are submitted to the user. According to his answers, an estimation of the potential subsidies and grants is then generated.

#### *Inputs:*

From the user (homeowner):

- Form's answers

*Outputs:* Grants and subsidies available

At the end of this process, the user is connected to a network of professionals

## 1.4. Find professionals

*Target:* Homeowner and potentially co-owners

*Process:* The user fills in search criteria (localisation and wished retrofit skills) thus a list of the corresponding professionals is generated.

#### *Inputs:*

From the user (homeowner):

- Search criteria

*Outputs:* A list of professionals. In some countries, work must be undertaken by certified professionals only. For example, in France, professionals must own the RGE certification (RGE – Reconnu Garant de l'Environnement).

At the end of this process, the user is connected to a network of professionals



## 1.5. Punch diag

*Target:* Homeowner and potentially co-owners

*Process:* The user is prompted to describe his house by selecting one among 3 pictures to give the state of several elements of his house. These elements are shown on a schematic drawing.

*Inputs:*

From the user (homeowner):

- Choice of one picture for each element (around 10 elements in total)
- Additional answers

*Outputs:* Ranking of each element, global ranking of the house and potential of progress on several indicators (for example: energy consumptions, comfort, air quality, etc.). Prefill of Smartdiag questionnaire.

At the end of the process, the user is redirected toward Smartdiag if he/she lives in a single-house, or a list of energy assessors to carry out a complete energy assessment if he lives in a multifamily building.

## 1.6. Road maps

*Target:* Homeowner and potentially co-owners

*Process:* If the user indicates that he/she cannot carry out all the works listed in the “to start a complete retrofit project” roadmap, a timeline of these works is given to help him/her choose which one must be done first. Alerts are given about potential clashes or disorders between different works.

*Inputs:*

From the user (homeowner):

- Mention that he/she cannot carry out all the works in the same time

*Outputs:* Timeline of the works and alerts on the potential clash or disorder between different works.

At the end of this process, the user is connected to a network of professionals

## 2. REQUIRED DATA

Adapting features for other countries will require several questions to be answered. These questions must be answered for each feature (as data may differ from one feature to another).

- First, are the data available in the considered country for adapting the features?
  - o If yes, are the data in the same format as the French data? Are the data values accurate or should they be updated to fit the features goals?
  - o If no, the considered feature is not deployable in the considered country.

When these questions are answered, adapting the features can be considered using the local data. As a data source can be used in several features at a given e time, we decided to present a list of all the required data rather than a list of the features together with their own required data. For each data source, required questions which need to be answered before a potential adaptation are highlighted in orange.

## 1.1. User inputs

*Answers of a form (between 15 and 20 questions):*

Possible answers may be different according to the country of interest. Notably, systems can be added or removed.

*Example:* In France, three systems of combustible heating are proposed:

- Condensing boiler
- Gas or fuel boiler
- Low temperature boiler

**For every question:** Do other systems need to be added or removed? If yes, which ones?

*List of questions available in annex 1*

## 1.2. External inputs

*Climatic data*

All the climatic data listed below are needed on an hourly timestep over the five past years for each available weather station in the newly considered country:

- External temperature
- Wind speed
- Wind direction

*Example:* In France, climatic data are provided by 316 weather stations covering the whole territory.

Are climatic data available with the appropriate time step and time period for each available weather station?

*Cadastral data*

Smartdiag was designed to assess an energy diagnosis by asking the fewest questions possible. Thus, it uses all the external data available from an address.

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Cadastral data available for a house are:

- Address (street, postal code, city)
- Geographic coordinates of each points constituting the polygon of the building
- Floor area

Geographical mesh is related to the country of interest and should probably be adapted to fit each country particularities.

Are cadastral data available for each building with an address?

#### *Technical data based on construction standards*

- A list of the construction industry standards over the years
- For each construction industry standard, technical characteristics of the following items must be defined:
  - Wall (thermal resistance, insulation thickness, etc.)
  - Roof (thermal resistance, insulation thickness, etc.)
  - Floor (thermal resistance, insulation thickness, etc.)
  - Window (thermal resistance, double gazing, etc.)
  - Heating system (type, energy performance, etc)
  - Ventilation (air-tightness standards, ventilation rates, typical ventilation systems)

*Example:* In France, the RT2012 “Reglementation Thermique 2012” (i.e Thermal Regulation 2012) presents several requirements:

- Renewable energy use obligation
- Airtightness under  $0,6 \text{ m}^3/(\text{h} \cdot \text{m}^2)$  for a house and  $0,6 \text{ m}^3/(\text{h} \cdot \text{m}^2)$  for a multi-family building
- etc

What are the construction industry standards? For each, what are their technical characteristics?

#### *Images*

For Punch diag, representative pictures are needed so that the user can easily describe the state of his house.

#### *Cost of works*

For each country, cost of works is based on the cost-of-living index and the social context of the country.

For each type of renovation work and each product installed, the following items must be defined:

- Labour cost
- Material cost
- Complementary work cost

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Example:

- Type of work: window replacement
- Available products:
  - Aluminium - double glazing – one casement – window
  - PVC - double glazing – double casement – window
  - etc

Currently, more than 600 prices are defined to help costing works in France.

What are the labour, material and complementary work costs of each product in the newly considered country?

#### *Energy cost (electricity, gas, fuel, wood)*

- Average price of electricity (€/kWh)
- Average price of gas (€/kWh)
- Average price of fuel (€/kWh)

#### *List of work*

To reduce energy consumption and by extension the energy bill, specific retrofit work needs to be done before other types of works in order to define a roadmap:

Actual order is based on empiric observations in France.

In another country, order of retrofit work priority may be different. Moreover, the list of proposed works may also be different.

*Example:* in countries presenting a higher outside temperature than France, “having an air conditioner more efficient” will probably have a higher priority level.

List of retrofit works and priority order of the retrofit works based on the context of the newly considered country.

#### *Subsidies*

In France, two main subsidies/grants are estimated in the developed features mentioned in the section 1:

- Ma Prime Rénov that will replace CITE (Crédit d’Impôt à la Transition Energétique) *i.e* Tax credit
- CEE (Certificat d’Economies d’Energies) *i.e* White certificate

Others subsidies/grants may be available but they are not included in the current process.

For each grant or subsidy/grant:

- Eligibility criteria
- Calculation method

### *Professionals directory*

The adaption of the platform needs a professional directory with the following information:

- Certification
- Postal address
- Job and speciality
- Financial data

### *Network of professionals*

This type of data is not technical but still mandatory to present an operational retrofit service.

At the end of each feature, the user is connected to several professionals, which are recruited by commercials.

## **3. ECONOMIC AND LEGAL ASPECT**

The adaptation of the platform needs

- Domain name
- GDPR
- A company which manages the platform with financial and technical (hosting etc) aspects

## **4. CULTURAL AND USER BEHAVIOUR**

All the contents should be translated and adapted to stimulate homeowners to invest in home energy efficiency upgrades.

Images must be representative, the choice of the words must be adapted, as well as the tone of the contents (humour or not? familiar tone or not? “Usted” or “tu” ?)

## **5. KNOWLEDGE TRANSFER MEETING**

CSTB will organize 2 Knowledge Transfer Meetings (one in Spain, one in Ireland) with project partners and representatives from the LIG of Spain and Ireland.

- a. In Ireland: 27<sup>th</sup> April 2020
- b. In Spain: Not fixed yet

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The objectives of these meetings are to explain:

- a) The concept behind the TURNKEY RETROFIT service
- b) How the service is operated in France, that is to say Heero and the additional bricks that are being developed. The involved stakeholders, how Heero meet their needs and the associated business model.
- c) What kind of contextual data are needed to run the digital platform. This deliverable sets the list of data required.
- d) How to collect and manage missing data. The LIG would provide answers to this deliverable.

These meetings will allow the local partners from each country to prepare the adaptation of the TURNKEY RETROFIT service (including the digital platform) to Spain and Ireland.

The following steps are planned to prepare these KTM :

- D1.3 issued: 15/03/20
- D1.3 dissemination within each LIG by ANERR and IGBC: 30/03/20
- First version of Heero platform and additional bricks released: 15/04/20
- Compilation of the LIG reactions / answers / questions by ANERR and IGBC: 22/04/20
- Preparation of the KTM based on these reactions: 24/04/20 for the Irish KTM

## **CONCLUSION / SUMMARY / POLICY RECOMMENDATIONS**

This deliverable is an important step for the Implementation of the TURNKEY platform in Spain and Ireland.

Discussions have already started between the partners to co-develop the platform (see D1.2) but D1.3 will allow each country to assess the technical constraints for the adaptation, and then refine the development priority and plan the effort accordingly.

This deliverable is also a tool that will help prepare the KTM in Spain and Ireland.



## ACRONYMS AND ABBREVIATIONS

<b>ANERR</b>	Asociación Nacional de Empresas de Rehabilitación y Reforma
<b>BPIE</b>	Buildings Performance Institute Europe
<b>CA</b>	Consortium Agreement
<b>CO</b>	Coordinator
<b>CSTB</b>	Centre Scientifique et Technique du Batiment
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>GA</b>	Grant Agreement
<b>H2020</b>	Horizon 2020
<b>IGBC</b>	Irish Green Building Council
<b>IP</b>	Intellectual Property
<b>NUIG</b>	National University of Ireland, Galway
<b>QA</b>	Quality Assurance
<b>R2M</b>	R2M Solution SRL
<b>TECNALIA</b>	Fundación TECNALIA Research & Innovation
<b>ToC</b>	Table of Contents
<b>TURNKEY RETROFIT</b>	TURNKEY solution for home RETROFITting
<b>WP</b>	Work Package

## ANNEXES

### Annex 1 : List of questions

1. Construction date
  2. Number of floors
  3. Numbers of rooms
  4. Heated surface
  5. Attic type
    - a. Converted and heated
    - b. No attic
    - c. Converted but not heated
  6. Number of garage
  7. Garage type
    - a. Not attached
    - b. Fully attached
    - c. No garage
  8. Type of window
    - a. Alu
    - b. PVC
    - c. Wood
  9. Basement type
    - a. No basement slab on grad house
    - b. No basement house on crawl space
    - c. Not heated
  10. Heating system
    - a. Heat pump
      - i. Air/air
      - ii. Air/water
      - iii. Water/water
      - iv. Ground source
      - v. none
    - b. Boiler type
      - i. Standard
      - ii. Low temperature
      - iii. Condensing boiler
    - c. Electric heating system
      - i. Electrical convector
      - ii. Radiating panel
      - iii. Electric heater
      - iv. Storage heater
      - v. Fan coil unit
      - vi. Other joule effect heating
  11. Wood additional heating
-

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- a. Closed insert
  - b. Open chimney
  - c. Wood stove
- 12. Hot water system
  - 13. Equipment
  - 14. Number of adults
  - 15. Number of children
  - 16. Works already done

**Annex 2: T1.2 and T2.2 User story listing**

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