D1.2 Project Management Plan

WP1, T1.1

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Technical references

Project Acronym	HAPPENING
Project Title	**H**e**A**t **P**um**P**s in existing multi-family buildings for achieving union's **EN**ergy and envIro**N**mental **G**oals
Project Coordinator	Irantzu Urkola Tecnalia irantzu.urcola@tecnalia.com
Project Duration	1st October 2020 – 31st March 2024 (42 months)

Deliverable number	**D1.2 Project Management Plan**
Dissemination Level	PU
Work Package	WP1 Project management and coordination
Task (s)	T1.1 Project coordination and quality assurance
Lead beneficiary	TECNALIA
Contributing beneficiary(ies)	EURAC, FRAUNHOFER, TECNOZENITH, RINA-C, GBCe
Due date of deliverable	31st December 2020 (2020/12/31)
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Table of content

Figures

Versions

No.	Name SURNAME	Partner	Contribution	Date
0.1	Irantzu URKOLA	TECNALIA	Structure of the document and the chapter 1	2020/11/09
0.2	Irantzu URKOLA	TECNALIA	Chapters: 2, 5, 6	2020/11/10
0.3	Irantzu URKOLA	TECNALIA	Chapters3, 4, 7 and 8 and Annexes	2020/11/20
0.4	Jon Ander LANDETA	TECNALIA	Revision of the document	2020/11/20
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1.0	Irantzu URKOLA	TECNALIA	FINAL VERSION	2020/12/28

Disclaimer

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Abbreviations and acronyms

Acronym	Description
CA	Consortium Agreement
DHW	Domestic hot water
EC	European Commission
ESCO	Energy Services COmpany
GA	Grant Agreement or General Assembly, on depend on the context
GHG	GreenHouse effect Gases
PE	Primary Energy
PSC	Project Steering Committee
PV	Photovoltaics
QAP	Quality Assurance Plan
WP	Work Package
WPL	Work Package Leader

Abstract of the HAPPENING project

Currently, **buildings are responsible for 40 % of the energy demand and 36% of the CO₂ emissions in Europe**. Decarbonisation of existing buildings plays a key role in order to reach the overall climate protection targets. However, current renovation rates lie in the order of 1%.

Heat pumps are a key technology in bringing renewable shares into heat supply of buildings; especially their combination with onsite renewable electricity production e.g. by PV allows to bring high renewable shares. Their current installation in existing multi-apartment buildings is however still marginal.

The proposed technological solution is based on decentralized heat pumps, in such a way that it results an easy-to-install solution for installers, low-intrusive for the occupants and easily adaptable to a large number of different building situations. This is flanked by developing near-zero planning, implementation and operation processes, in order to facilitate the work during the planning phase, ensure a high-quality installation and effective operation, and reduce the efforts and costs within the whole retrofitting project. The challenge of cost-competitiveness is addressed by developing new financial and business models. Bringing new players (such as financial experts) and financing models to the renovation market is expected to bring the needed paradigm change and boost investments in the residential retrofitting sector. Dissemination of measured performance and system characteristics from HAPPENING will be one of the key results of the project.

Through **3 demo sites (Spain, Italy and Austria)**, the project will demonstrate a highly versatile, scalable and replicable solution package for buildings energy system retrofitting allowing 70-75% of renewable energy fraction, 30-50% of PE and GHG savings, reduction of planning time by 50% and installation/operation time by 30% and payback time for ESCOs and investors of less than 8 years, compared to best available solution existing today.

1.   Introduction

1.1   Objective of the deliverable D1.2

The <u>main objective</u> of the **WP1** is to develop an effective, transparent and comprehensive administrative, financial and legal **management** to ensure the successful execution of the project.

This WP1 is led by TECNALIA and participated by the WP Leaders, i.e. EURAC, FRAUNHOFER, TECNOZENITH, RINA-C and GBCe.

The management WP consists of four tasks, that last the whole duration of the project:

- T 1.1 Project coordination and quality assurance
- T 1.2 Communication, reporting and monitoring
- T 1.3 Ethic issues and gender management
- T 1.4 Data management plan

This **deliverable D1.2** is related to the task T1.1 and is aimed at **defining the project management plan**, in other words, establishing the management and working model to be followed in the HAPPENING project.

1.2   Deliverable description

The deliverable D1.2 is structured into several chapters explaining the following key aspects related to the project management in the project:

- Governance structure
- Communication channels
- Reporting process
- Quality plan for deliverables
- Innovation management
- Conflict resolution
- Risk Management
- Annexes

1.3 Contribution of partners

The task T1.1 in WP1 is led by TECNALIA and participated by the WP Leaders, i.e. EURAC, FRAUNHOFER, TECNOZENITH, RINA-C and GBCe.

Being so, TECNALIA, as the lead beneficiary of the project is the main contributor of the content provided in this deliverable, together with the WP Leader partners, contributing also to the management and working procedures defined in this document.

1.4 Relation with other activities in the project

This deliverable is related with each and all activities, tasks and work-packages in the project as this "Project Management Plan" will be the basis for the procedures to be followed in the execution of the project to guarantee the success and the accomplishment of the challenging objectives.

2.   Governance Structure

The HAPPENING **project governance** is structured into 3 layers:

- Governing layer
- Steering layer
- Performing layer

In the next Figure 2.1, the governance structure of the HAPPENING project is exposed:
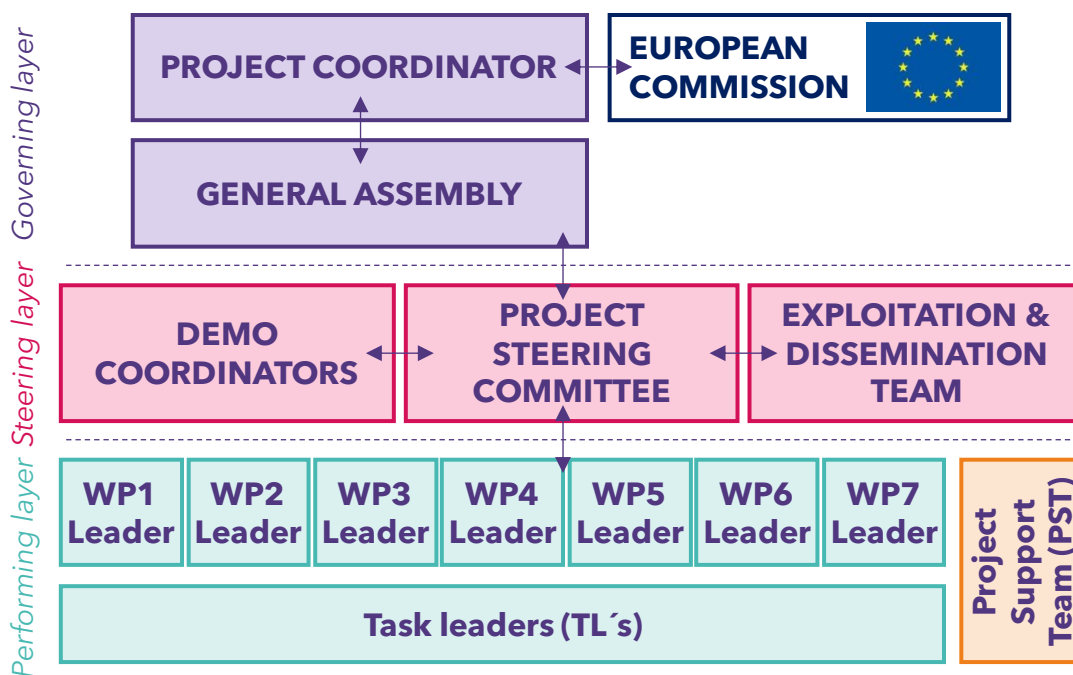
Figure 2.1: Governance structure of the HAPPENING Project

2.1   Governing layer

In general terms, the Project Coordinator and the General Assembly are the key agents or bodies in the governing layer, which is the management layer operating at director level to determine the vision and strategy for the entire project.

Project Coordinator (PC) - TECNALIA

The main responsibility of the PC is to ensure the timely and effective overall progress of the project according to the Grant Agreement. The PC is the intermediary between the Consortium and the EC, dealing also with contractual, administrative and financial

matters in addition to overall responsibility for project progress reporting. The PC ensures the timely and effective overall progress of the project, monitoring compliance by Parties with their obligations and will manage all the aspects connected with payment of financial contributions, administering the financial contribution of the EC. PC will be in charge of managing the preparation, signature and maintenance of a Consortium Agreement (CA) between partners.

The Project Manager (PM) appointed by TECNALIA for HAPPENING is Ms. Irantzu Urkola. The PM, assisted by the Project Support Team (PST) and supported also by the Project Steering Committee (PSC), is responsible of the communication between the Consortium and the EC, as well as the day-to-day administrative, legal and financial issues.

General Assembly (GA)

The GA, participated by all the partners, is the highest-level decision-making body of the project, chaired by the Project Manager and composed by a senior representative from each partner. The GA meets physically twice a year and it is responsible for the project overall strategy, in charge of all important decisions of general nature within the frame of the Grant Agreement (GA) signed with the EC and the Consortium Agreement (CA) signed among all partners, especially when such decisions may affect the agreements reached in these two contracts (examples: changes in the management structure, changes in the consortium composition, changes in the work plan, major technical decisions, contingency plans and planning decisions affecting the resources or the time for the implementation of the project, etc.).

The GA is also responsible for ensuring that the project remains in line with the overall objectives and checks the progress according to the set of deliverables and milestones, based on regular updated reports of the project activities received from the Project Steering Committee and Project Coordinator.

2.2   Steering layer

The Steering layer is composed by the Project Steering Committee (PSC), the Exploitation and Dissemination Team and the Demo Coordinators. This layer provides general project direction and guidance, keeping the project focused towards its objectives, mobilizing the necessary resources and monitoring the project performance. It reports to the governing layer bodies and focuses on day-to-day project operations.

Project Steering Committee (PSC)

The PSC is the supervisory body of the advances of the project and is formed by WP leaders and chaired by the Project Manager. The WP Leaders are: TECNALIA (WP1,

WP4, WP8), EURAC (WP2), FRAUNHOFER (WP3), TECNOZENITH (WP5), RINA-C (WP6) and GBCe (WP7).

The PSC, executive body of the project, is responsible for proposals and recommendations to the GA on the global steering, monitoring and management of the project, as well as for the execution of the GA decisions. Therefore, the PSC acts as a "core group" assuming the executive decision making and supporting the Project Coordination in relevant management aspects.

The PSC manages all the technical activities outlined in the project's work plan and is responsible for the day-to-day liaison between Consortium partners to consolidate inputs into project planning, progress monitoring and technical milestone reporting.

Exploitation & Dissemination Team (EDT)

The Exploitation and Dissemination Team or EDT is composed of three experts in the Consortium to assist to the PSC regarding exploitation, dissemination and innovation management issues. The Exploitation Manager (EM, RINA-C) is responsible for the exploitation plan and follow up on this plan, coordinating exploitation activities across partners. The Dissemination & Communication Manager (DM, GBCe), on the other side is responsible for the dissemination plan, communication, and other communication mechanisms.

The EM, in close collaboration with the DM, coordinates all the exploitation, dissemination, communication and training activities, and they are also responsible for IPR management.

The Innovation Manager (IM, TECNALIA) is the responsible person for verifying that the development of the project is being done according to the innovation management process (see chapter "6 *Innovation management*"). The IM assists to the PSC meetings in order to assure the innovation management plan is being followed into the work plan: the generation of innovative ideas, verification of the state-of-the-art evolution, the TRL status of the technology, the demands of the market, the state of patentability, the potential of business, etc.

Demo Coordinators

The demonstration nature of HAPPENING determines the workplan and partners organisation. A **Local Demo Team** is formed for each demo site and the purpose of these working groups is to facilitate the implementation of the HAPPENING system by dealing with case-specific issues, such as, local regulatory framework, etc.

- *Leader* and members of the Local Demo Team in Ispaster: *TECNALIA*, BARRIZAR, GIROTZE

- Leader and members of the Local Demo Team in Verzuolo: *EURAC*, TECNOZENITH, INNOVA

- *Leader* and members of the Local Demo Team in Graz: *AEE*, GWS

2.3   Performing layer

In the performing layer, the WP Leaders and the Task Leaders oversee the execution of the work committed in the project.

Work Package Leaders (WPL)

The WP leaders are the partners responsible for managing the tasks grouped in the Work Packages (WP). The WPL reports to the PSC, ensuring the timely fulfilment of duties from the scientific and technical point of view. The WPLs assure the coordination between the different project teams that collaborate with the aim of exchanging intermediate results. They assure the timely execution of tasks included in each WP, stimulating the interaction between the various partners involved. They are also in charge of the consolidation of the reports and execution of the tasks within each WP.

Task Leaders (TL)

The TL is responsible of the technical follow-up of the specific task and the detailed coordination with the other tasks within the same work package. They assure the timely and proper execution of their tasks and report to the WPL in case of any deviation or risk. They are also responsible for leading the preparation of the deliverables resulting from their tasks and the coordination with other tasks for their participation in the deliverable preparation, and for the preparation and delivery of internal task progress reports to the WP leader.

Partner Representative (PR)

In order to limit any duplication of information and to facilitate an efficient communication process by both face-to-face and virtual channels, the distribution of all relevant project information is channelled through the Project Manager to one key person for each partner (Partner Representative). The PR is member of the GA (in case of unavailability a deputy or assistant could be appointed) and acts as a switchboard thus ensuring that the concerned persons within the partner organisation are reached as required.

3.   Communication channels

The **fluent and continuous communication** is one of the **key pillars for success** in the accomplishment of the ambitious goals of the HAPPENING project.

The communication occurs at different levels in the project:

- Communication within the Consortium – Internal communication
- Communication with the Project Officer, European Commission
- Communication with the external audience

3.1   Internal communication channels

For the **communication between all the partners of the Consortium**, several internal communication channels and tools are on disposal to the whole Consortium, such as:

- SharePoint repository
- Contact list and emails
- Project meetings

These internal communication channels and tools are explained in detail in the deliverable "*D1.1 Quality Assurance Plan (QAP)*".

3.2   Communication with the Project Officer, European Commission

The Communication **with the EC** is centralized through the Project Coordinator. According to the governance structure of the project, "*the PC is the intermediary between the Consortium and the EC, dealing also with contractual, administrative and financial matters in addition to overall responsibility for project progress reporting*".

The PC will keep open the communication channels with the Project Officer (PO), Mr. Piotr WAIS. The main communication channels will be:

- Email & phone
- SEDIA (Single Electronic Data Interchange Area) portal
- Meetings, both official meetings of the projects and bilateral audio-meeting among TECNALIA and the PO

3.3   Communication with the external audience

The Communication with the external audience is the working topic of the "WP7 Communication and Dissemination".

In the WP7, led by GBCe and participated by all the partners, a Communication strategy and a Dissemination strategy will be defined, and dissemination and communication activities will be developed and executed throughout the whole project. This work will raise awareness of the potential benefit for retrofitting the building stock, the replicability potential of the system, ultimately leading to a higher impact of the positive results.

The required dissemination and communication material will be created, and the most appropriate channel will be chosen in each communication and dissemination activity to maximize the impact for the various market beneficiaries (ESCOs, facility managers, planners, installers, technology providers, building owners and occupants) of the HAPPENING solution.

4.   *Reporting process*

The whole reporting process, both internal and official ones, in the HAPPENING project is summarized in the next Figure 4.1:
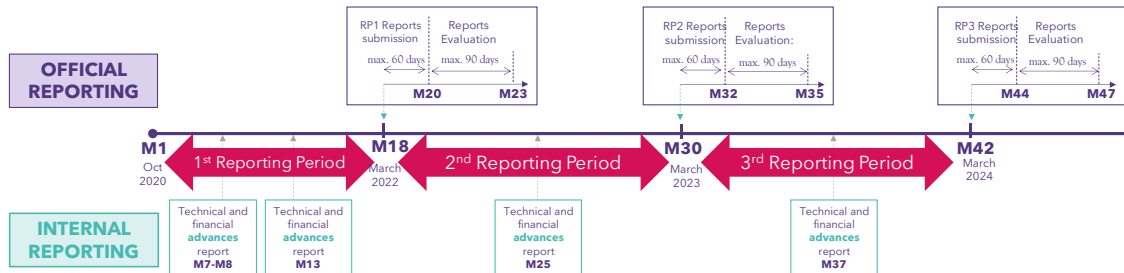

Figure 4.1: Reporting process in HAPPENING

In the following two subchapters, the reporting process to be followed in the HAPPENING project is explained: frequency, scope, templates, etc.

4.1   Periodic Progress Reports

To support the project reviews, three specific reports namely Periodic Progress Reports and a Final Report will be prepared and delivered. These will be organised by the Project Coordinator that will request the necessary contributions from partners. These activities will be considered as part of the WP1 although they are not officially considered as deliverables by the European Commission.

The Coordinator must submit the technical and financial reports to the Agency within 60 days following the end of each reporting period, according to the Article 20 in the Grant Agreement, including requests for payment and using the forms and templates provided in the electronic exchange system.

During the life of the project, the official progress reposts (RPs) to the Commission will be three:

- **PR1: 1st report from month 1 to 18**
- **PR 2: 2nd report from month 19 to 30**
- **PR 3: 3rd and last report from month 31 to 42**

The periodic report must include the following:

- **Part A - a 'periodic technical report'**, containing an explanation of the work carried out by the partners, an overview of the progress towards the objectives of the action, including milestones and deliverables, a summary for publication

by the Agency, and the answers to issues related to the action implementation and the economic and societal impact.

- **Part B - a 'periodic financial report'**, including an 'individual financial statement' from each partner and an explanation of the use of resources and the information on subcontracting from each partner for the reporting period concerned.

The methodology for the reporting progress will be as follows:

- At the end of the reporting period:
  - each partner will start working on the reporting of the activities carried out (technical) and the resources consumed (financing) for the reporting period concerned.
  - each WP Leader will start working on the technical reporting of the activities / advances carried out in the WP for the reporting period concerned.
    - The Workplan excel and the internal reporting processes will serve as input for this official reporting making these tasks easier.
    - Every General Assembly (every 6 months) an update of the status of each WP will be presented that will serve as following-up for the performance of the project and also as input for the official reporting.

- After 20 days of the end of the reporting period:
  - each WP Leader will receive the technical reports and financial statements of the partners involved in the WP:
    - to integrate all this information on the technical reporting of each WP.
    - to review the appropriacy / coherence of the technical advances and the resources consumption.
  - TECNALIA will receive the technical reports and financial statements of all the partners and will contact each of them to review the appropriacy of the numbers.
  - During this step, TECNALIA and the WP Leaders will communicate each other about any issue that might arise.

- After 30 days of the end of the reporting period, TECNALIA and the WP Leaders will make the last revision of the appropriacy / coherence of the technical advances and the resources consumption of each WP and each partner.

- During the next 7 days:
    - the WP Leaders will validate the technical advances with all the partners involved in the WP
    - TECNALIA will validate the financing statements with all the partners.
- During the next 15 days, TECNALIA and the WP Leaders will elaborate and work on the part A and part B of the periodic progress report to prepare it for submission.

4.2　　Internal Reports

Regarding the **internal reporting process** during the project, the report about advances, both technical and resources consumption, will be carried out every 6 months. The **objectives** of this internal reporting process are:

(1) to solve any doubt that may arise among partners

(2) to detect any deviation or problem or risk and to act consequently

The internal 6-month reporting process will be done using an easy to fulfil excel file to gather the next information about each partner:

- Summary table of the human resources (measured as person-month or PM) dedicated to each WP.
- Explanation of the activities carried out in each WP.
    - In the 2-monthly WP Leaders meeting, each WP leaders will also provide an update of the advances in the activities and objectives in the WP.
    - In the General Assembly every 6 months, an update of the status of each WP will be presented
- Gender (male, female, non-binary gender) and professional category (researcher / non-researcher) of the people working in the semester in the project.

At the end of the first semester of the project, i.e. by the end of March 2021, the Project Coordinator will explain in detail how to fulfil this excel file and will support all the partners in the completion of this report during April and May 2021.

5.   Quality plan for deliverables

The quality plan for deliverables is encompassed by two parts:

- Procedure for Deliverable review
- Templates and formats

These two tools created to assure the quality of the deliverables are explained in deep details in the deliverable *"D1.1 Quality Assurance Plan (QAP)"*.

6.   *Innovation management*

Innovation management is the key for boosting competitiveness and sustainable growth in Europe. The effective innovation management system needs to include the innovation from the idea generation to the market results.

The innovation management procedure (IMP) is established as to maximize the capability of project outputs of being successful in the form of future products, services or processes, by combining creativity and a technical and market wise perspective.

The HAPPENING project will implement TECNALIA's Standard Innovation Management Process ISAMPE, a derivative of ISAEP model 1. The innovation management is explained in deep details in the deliverable "D1.1 Quality Assurance Plan (QAP)".

7.   Conflict Resolution

Consortium Agreement includes full details about the voting rules of decision bodies' mechanism. The resolution of problems and conflicts must be handled systematically and establishing a good working relationship between the project team members is a prerequisite for the quick resolution of problems and issues.

This chapter is therefore focused on the procedure for the escalation and resolution of conflicts and here the key ideas to be kept clear among all the partners are outlined. Conflicts must be resolved at the lowest possible level, starting at task level, followed by WP, and at last level in the PSC and GA as the last level:

1. In day-to-day work, task leader will face several decisions in order to develop the project. Task leaders are entitled to take such decisions and report them to the WP Leader.

2. In case of controversial decisions generating a conflict among partners, they have to be communicated as soon as possible to the WP Leader involved to make a decision on it through a "principled negotiation" process focused on optimising outcomes and maximising the benefits of all parties involved.

3. In the unlikely case that serious disputes arise among project partners, conflict resolution procedures will be initiated, whereby the Project Manager will advise the Project Steering Committee, the decision body where difficult-to-solve conflicts among partners are to be dealt, to meet in an emergency session to discuss the conflict and reach a resolution. PSC will hear to all the partners involved, will discuss about alterative solutions and will come with an agreement. The final decision will be taken by consensus preferable and if not possible, then the majority of voting will be decision making method, being the vote of the Project Coordinator decisive in case of tie. The Project Coordinator can consult PO or a third-party, if necessary.

4. All decision will be taken in the framework of the GA and CA without overruling them.

8.   Risk Management

Thanks to the continuous internal reporting process, to the Workplan Excel (explained in deep details in the deliverable "D1.1 Quality Assurance Plan") and to the (at least) 2-monthly WP Leaders and WP meetings, any unexpected challenge, problem or risk can be identified promptly. In addition, since the beginning of the project, some key risks to be kept monitored have already been identified and listed in the "*Annex 5: List of risks pre-identified the project*".

The management of identified risks deserves a specific procedure to assure the appropriate approach to the risk in order to avoid or at least to limit the negative effects (difficulties, delays, etc.) on the accomplishment of the committed objectives of the project. So that, the Project Coordinator and the WP Leaders must work together to carry on contingency plans to deal with the identified risks.

The risk management procedure in the HAPPENING Project follows these steps:

- Any partner in the Consortium may identify risks. The risks may be identified during the execution of any activity of the project, during the internal technical reporting process, during the planning process of the next semester (Workplan Excel) or even during the conversations in the project-meetings (WP Leaders meetings, WP meetings, GA&PSC meetings, etc.). There can be four categories or types of risks:
    - Implementation risks, related to technical factors
    - Financial risks, related to unexpected situations affecting the expected investment plans of partners
    - Intellectual Property risks
    - Management and administrative risks
- Once the risk is identified, it must be communicated to the WP Leaders involved and to the Project Coordinator about the identified risk arisen during execution, planning or coordination of the activities of the project.
- The Project Coordinator and WP Leaders deal with the risks during the next WP Leaders meeting, or the next GA & PSC meeting, categorizing them using two parameters:
    - Probability of the risk to occur: high, medium, low
    - Impact if the risk occurs: high, medium, low
- Based on this categorization, the Project coordinator and the WP Leaders prioritize the risks and a contingency plan is defined for each risk. As a rule, the

contingency plans will be drafted with occasion of the internal progress reports (every 6 months), unless an urgent action is required.

Annexes

Annex 1: Consortium members

	PARTNER	Short name	Type of organisation	Country
1	FUNDACION TECNALIA RESEARCH & INNOVATION	TECNALIA	RTD	Spain
2	GIROTZE SL	GIROTZE	SME	Spain
3	EZE BARRIZAR KOOP ELK TXIKIA	BARRIZAR	SME	Spain
4	ACCADEMIA EUROPEA DI BOLZANO	EURAC	RTD	Italy
5	TECNOZENITH SRL DI DELGROSSO & C.	TECNOZENITH	SME	Italy
6	INNOVA SRL	INNOVA	SME	Italy
7	AEE - INSTITUT FUR NACHHALTIGE TECHNOLOGIEN	AEE	RTD	Austria
8	GWS GEMEINNUTZIGE ALPENLANDISCHE GESELLSCHAFT FUR WOHNUNGSBAU UND SIEDLUNGSWESEN MBH	GWS	SME	Austria
9	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V .	FRAUNHOFER	RTD	Germany
10	RINA CONSULTING SPA	RINA-C	Large company	Italy
11	GREEN BUILDING COUNCIL-ESPANA CONSEJO PARA LA EDIFICACION SOSTENIBLE-ESPANA	GBCe	Association	Spain
12	ASOCIACION NACIONAL DE EMPRESAS DE SERVICIOS ENERGETICOS ANESE	ANESE	Association	Spain

Annex 2: Gantt chart of the HAPPENING Project

Workpackages and Tasks	Timeline (Month / Year)	Deliverables & Milestones
Years	2020 (1); 2021 (2–13); 2022 (14–25); 2023 (26–37); 2024 (38–42)	
Workplans	Workplan 1 (1–6); Workplan 2 (7–12); Workplan 3 (13–18); Workplan 4 (19–24); Workplan 5 (25–30); Workplan 6 (31–36); Workplan 7 (37–42)	
WP 1 – Project management and coordination	1–42	
T 1.1 Project coordination and quality assurance		D1.1, D1.2 (M3)
T 1.2 Communication, reporting and monitoring		
T 1.3 Ethic issues and gender managment		D1.3 (M3)
T 1.4 Data management plan		D1.4 (M6)
WP 2 – Industrialisation of HAPPENING technologies	1–39	
T 2.1 Industrialisation of heating, cooling and DHW units		D2.1 (M6); MS1 (M12)
T 2.1.1 Analysis of the normative and legislation in reference markets		
T 2.1.2 Industrialisation of micro heat pumps with R290 refrigerant		
T 2.1.3 Development of a dwelling DHW storage tank		
T 2.1.4 Functional mock-ups construction and laboratory tests		
T 2.2 Development of the smart energy management system		D2.2 (M12); D2.4 (M15); D2.5 (M18); MS6, D2.3, 6 (M24)
T 2.2.1 Wireless sensors implementation		
T 2.2.2 Smart control hardware architecture development		
T 2.2.3 Modelling and optimization of energy storage capacity		
T 2.2.4 Development and implementation of Model Predictive controls		
T 2.2.5 Remote control application for end-users		
T 2.3 Fitting HAPPENING system into existing building stock		D2.7 (M38)
T 2.3.1 Reference solution assessment for HAPPENING system installation		
T 2.3.2 Numerical analysis of HAPPENING overall system performance		
WP 3 – Monitoring for performance evaluation and smart controls	1–42	
T 3.1 Definition of monitoring concept		D3.1 (M15)
T 3.2 Technical realisation of the monitoring		MS4, D3.2 (M24)
T 3.3 Data evaluation and online platform		MS7 (M27)
T 3.4 Cross comparison of main results		D3.3 (M42)
WP 4 – Demo implementations	1–42	
T 4.1 End-user requirements and building constraints		D4.1-3 (M9)
T 4.2 Case-specific system design		MS3, D4.4-6 (M16)
T 4.3 Implentation and commissioning		MS5 (M24)
T 4.4 Techno-economic assessment		D4.7-9 (M37)
WP5 – Near-zero planning, implementation and operation processes and tools	7–37	
T 5.1 Energy Performance Guarantee planning & implementation guide		D5.1 (M15); D5.2 (M18)
T 5.2 Quality assurance analysis of HAPPENING system		MS8, D5. (M36)
T 5.3 HAPPENING system design guideline development		D5.4 (M39)
T 5.4 Technical manuals and instructions for installers and end-users		D5.5 (M36)
WP 6 – Replication and exploitation	1–42	
T 6.1 Environmental and social benefit of the solutions		D6.1, 2 (M18)
T 6.2 Business(-ESCO) models, bankability and contractual arrangements		D6.3 (M42)
T 6.3 Guidelines for replication addressing potential stakeholders		D6.4 (M42)
T 6.4 Regulatory and non-technical Framework		D6.6 (M42)
T 6.5 Exploitation strategy definition and agreements between partners		MS2 (M12); D6.7 (M24); MS9, D (M42)
WP 7 – Dissemination and Communication	1–42	
T 7.1 Communication strategy		MS2 (M12); D7. (M13)
T 7.2 Dissemination strategy		D7.2 (M12)
T 7.3 Development and execution of dissemination and comunication activities		D7.3 (M24); MS9, D7. (M42)
WP 8 – Ethics requirements	1–42	D8.1 (M6)

Annex 3: List of deliverables

Number	Deliverable Title	WP number	Related tasks	Lead Beneficiary		Type	Reviewer	Dissemination level	Due date	
				n°	short name				month	deadline
D1.1	Quality Assurance Plan	WP1	T1.1	1	TECNALIA	Report	EURAC	Public	3	31/12/2020
D1.2	Project Management Plan	WP1	T1.1	1	TECNALIA	Report	TECNOZENITH	Public	3	31/12/2020
D1.3	Ethic and gender issues consideration report	WP1	T1.3	1	TECNALIA	Report	FRAUNHOFER	Public	3	31/12/2020
D1.4	Data Management Plan	WP1	T1.4	1	TECNALIA	ORDP[1]	RICA-C	Public	6	31/03/2021
D2.1	Review of normative and legislation	WP2	T2.1 - ST2.1.1	4	EURAC	Report		Public	6	31/03/2021
D2.2	Industrialised heating, cooling and DHW units	WP2	T2.2, ST2.1.2 & ST2.1.3	6	INOVA	Demonstrator		Confidential[2]	12	30/09/2021
D2.3	Results of the laboratory tests	WP2	T2.2, ST2.1.4	4	EURAC	Report		Confidential[2]	24	30/06/2022
D2.4	Energy storage modelling and capacity optimization	WP2	T2.2 - ST2.2.3	7	AEE	Report		Public	15	31/12/2021
D2.5	Smart control hardware architecture	WP2	T2.2 - ST2.2.2	6	INOVA	Demonstrator		Confidential[2]	18	31/03/2022
D2.6	Model Predictive Control strategies	WP2	T2.2 - ST2.2.4	4	EURAC	Other		Confidential[2]	24	30/06/2022
D2.7	Results of numerical analysis of HAPPENING system performance	WP2	T2.3	4	EURAC	Report		Public	36	31/12/2022

[1] ORDP: Open Research Data Pilot
[2] Confidential, only for members of the consortium (including the Commission Services)

Number	Deliverable Title	WP number	Related tasks	Lead Beneficiary		Type	Reviewer	Dissemination level	Due date	
				n°	short name				month	deadline
D3.1	Monitoring concept definition of HAPPENING system	WP3	T3.1	9	FRAUNHOFER	Report		Public	17	28/02/2022
D3.2	Monitoring methodology implementation	WP3	T3.2	9	FRAUNHOFER	Report		Public	24	30/06/2022
D3.3	Overall results analysis	WP3	T3.4	9	FRAUNHOFER	Report		Public	42	31/03/2023
D4.1	End-user requirements and building constraints-Spanish demo	WP4	T4.1	2	GIROTZE	Report		Public	9	30/06/2021
D4.2	End-user requirements and building constraints-Italian demo	WP4	T4.1	5	TECNOZENITH	Report		Public	9	30/06/2021
D4.3	End-user requirements and building constraints-Austrian demo	WP4	T4.1	7	AEE	Report		Public	9	30/06/2021
D4.4	System design-Spanish demo	WP4	T4.2	1	TECNALIA	Report		Public	17	28/02/2022
D4.5	System design-Italian demo	WP4	T4.2	4	EURAC	Report		Public	17	28/02/2022
D4.6	System design-Austrian demo	WP4	T4.2	7	AEE	Report		Public	17	28/02/2022
D4.7	Techno economic assessment - Spanish demo	WP4	T4.4	1	TECNALIA	Report		Public	36	31/12/2022
D4.8	Techno economic assessment - Italian demo	WP4	T4.4	4	EURAC	Report		Public	36	31/12/2022
D4.9	Techno economic assessment - Austrian demo	WP4	T4.4	7	AEE	Report		Public	36	31/12/2022
D5.1	Measurement and Verification (M&V) Plan of Happening system	WP5	T5.1	12	ANESE	Report		Public	15	31/12/2021
D5.2	Energy performance Guarantee planning & implementation guideline	WP5	T5.1	12	ANESE	Report		Public	18	31/03/2022

Number	Deliverable Title	WP number	Related tasks	Lead Beneficiary		Type	Reviewer	Dissemination level	Due date	
				n°	short name				month	deadline
D5.3	Quality assurance analysis of HAPPENING system	WP5	T5.2	1	TECNALIA	Report		Public	36	31/12/2022
D5.4	HAPPENING system design guideline	WP5	T5.3	1	TECNALIA	Report		Public	39	28/02/2023
D5.5	Technical manuals and instructions	WP5	T5.4	2	GIROTZE	Report		Public	36	31/12/2022
D6.1	Technologies social and market acceptance	WP6	T6.1	10	RINA-C	Report		Public	18	31/03/2022
D6.2	Technologies benefit impact in terms of emissions	WP6	T6.1	1	TECNALIA	Report		Public	18	31/03/2022
D6.3	Business and ESCO Model	WP6	T6.2	10	RINA-C	Report		Confidential[2]	42	31/03/2023
D6.4	E-Handbook with guidelines for integration of the solutions in public and private, tertiary and residential buildings	WP6	T6.3	10	RINA-C	Report		Public	42	31/03/2023
D6.5	Business and Plan involving social/market aspects	WP6	T6.1, T6.2	10	RINA-C	Report		Public	42	31/03/2023
D6.6	Report on current standardization and non-technical barriers for HAPPENING replication	WP6	T6.4	12	ANESE	Report		Public	42	31/03/2023
D6.7	First version of the plan for use and dissemination of foreground and exploitation strategy seminar outcomes	WP6	T6.5	10	RINA-C	Report		Public	24	30/06/2022
D6.8	Final version of the plan for use and dissemination of foreground	WP6	T6.5	10	RINA-C	Report		Public	42	31/03/2023
D7.1	Communication strategy and results of the first activities	WP7	T7.1	11	GBCe	Report		Public	12	30/09/2021

Number	Deliverable Title	WP number	Related tasks	Lead Beneficiary		Type	Reviewer	Dissemination level	Due date	
				n°	short name				month	deadline
D7.2	Dissemination strategy and results	WP7	T7.2	11	GBCe	Report		Public	12	30/09/2021
D7.3	HAPPENING dissemination and communication work and results	WP7	T7.3	11	GBCe	Report		Public	24	30/06/2022
D7.4	HAPPENING dissemination and communication work and results 2	WP7	T7.3	11	GBCe	Report		Public	42	31/03/2023
D8.1	POPD - Requirement No. 2	WP8	NA	1	TECNALIA	Ethics	GBCe	Confidential[2]	6	31/03/2021

Annex 4: List of milestones

Milestone number	Milestone title	Lead beneficiary	Due date	Means of verification	Related WP
MS1	Prototypes of heat pumps manufactured by INNOVA, ready to be shipped to demo sites	6 - INNOVA	12	Prototypes of heat pumps manufactured by INNOVA, ready to be shipped to demo sites. Means of verification: Prototypes manufactured	WP2
MS2	Communication, dissemination and exploitation strategy defined	11 - GBCe	12	Communication, dissemination and exploitation strategy defined Means of verification: D6.7, D6.8, D7.1 & D7.2 performed and approved by EDT	WP6, WP7
MS3	System design of demo sites	1 - TECNALIA	17	System design of demo sites. Means of verification: System design of demo sites fully finished. All the technical details defined, ready to start interventions. D4.4., D4.5. and D4.6. performed and approved by PSC.	WP4
MS4	Measurement technology installed and commissioned. Online platform for the integration of the measurement raw data is set up	9 - FRAUNHOFER	24	Measurement technology installed and commissioned. Online platform for the integration of the measurement raw data is set up. Means of verification: Measurement technology installed and commissioned. Online platform for the integration of the measurement raw data is set up. Means of verification: Monitoring platform operational	WP3
MS5	New energy supply technologies, including storages, commissioned on the three demo sites	1 - TECNALIA	24	New energy supply technologies, including storages, commissioned on the three demo sites. Means of verification: New energy supply technologies, including storages, commissioned on the three demo sites Means of verification: Commissioning tests performed, and results meet expectations (D4.7, D4.8 & D4.9 performed and approved by PSC)	WP4
MS6	Model predictive controls programmed, ready to be implemented in the demo sites' BEMS hardware	4 - EURAC	24	Model predictive controls programmed, ready to be implemented in the demo sites' BEMS hardware. Means of verification: Model predictive controls programmed, ready to be implemented in the demo sites' BEMS hardware Means of verification: D2.5 performed and approved by PSC	WP2

Milestone number	Milestone title	Lead beneficiary	Due date	Means of verification	Related WP
MS7	Data processing scripts developed and integrated. Data analysis platform MONDAS set up, operational and accessible by partners. Visualisation of the performance accessible	9 - FRAUNHOFER	30	Data processing scripts developed and integrated. Data analysis platform MONDAS set up, operational and accessible by partners. Visualisation of the performance accessible. Means of verification: Data processing scripts developed and integrated. Data analysis platform MONDAS set up, operational and accessible by partners. Visualisation of the performance accessible Means of verification: Data analysis platform MONDAS operational. Access tested by partners and successful operation confirmed.	WP3
MS8	Quality assurance process of the HAPPENING validated	1 - TECNALIA	36	Quality assurance process of the HAPPENING validated. Means of verification: Quality assurance process of the HAPPENING validated Means of verification: D5.3 performed and approved by PSC	WP5
MS9	Dissemination, exploitation and communication plan successfully executed	11 - GBCe	42	Dissemination, exploitation and communication plan successfully executed. Means of verification: Dissemination, exploitation and communication plan successfully executed Means of verification: D5.3 performed and approved by PSC	WP6, WP7

Annex 5: List of risks pre-identified the project

No.	Description of risk	WP	Proposed risk-mitigation measures
1	Losing critical staff or partners at a crucial point of the project	WP1	Identify critical overreliance and mitigate with collaborative approach within consortium. Use consortium network to identify alternatives.
2	Unexpected delay and poor quality of the deliverables	WP1	Ensure rapid communication of delays within consortium and agree on support from partner with adequate resources. Draft versions of most of the Reports are foreseen. All partners are responsible for reviewing the deliverables.
3	WP resources not well balanced	WP1	Monitoring of the work and reallocation of resources in other WPs where necessary by the PST
4	The planned budget is too low	WP1	Careful planning and follow up of the budget during the implementation phase will be guaranteed by the Coordinator and WPL group.
5	Error in the estimation of a task duration	WP1	Milestones and deliverables placed for control. Under delays detection PC will encourage a review of task procedure.
6	Technologies do not comply with local normative	WP2, WP3, WP4	Since the technologies have been already demonstrated, the risk probability is low. However, the impact might be destructive, as non-compliance to normative and legislations might block the developments and installation at the demonstration buildings. For this reason, the entire development will be guided by the normative framework assessed at the beginning of the project
7	The geographical outreach and impact are too low	WP2, WP3, WP4, WP5	The three buildings and climate conditions selected for demonstration are diverse enough as to guarantee that solutions are widely applicable. The capacity building and dissemination activities set up and fostered through EU will guarantee the maximum multiplication effect
8	The development of HAPPENING solution delayed and time for monitoring too short	WP2, WP3, WP4	The planned development entails sufficient time for elaborating the innovative technologies and processes. The HAPPENING system development and installation activities should finish in M18, which leaves still margins (i.e. around 12 months) before the "1-year" monitoring phase is eroded.
9	Disputes over ownership of IPR amongst consortium partners	WP6	Standard IPR and access rights clauses will be included in the CA, will be signed before work starts in order to avoid future disputes. The consortium has already discussed these aspects during the proposal phase for avoiding such problems.
10	Breach of IPR rules stated in the CA	WP2, WP3, WP4, WP5, WP6	All partners are experienced with research and development projects. The Exploitation Manager will supervise the project elaboration to avoid this risk.
11	Planners, investors and ESCOs do not accept the technologies and processes	WP2, WP3, WP4, WP5, WP6	From market perspective, the highest risk resides in Planners, ESCOs and investors not accepting the technologies and processes developed. To prevent this risk the solutions will be elaborated and discussed in close collaboration with these partners, obtaining fresh and continuous feedback on the directions to be taken. The acceptance of the solutions will be tested already during project through the retrofit and capacity building.

No.	Description of risk	WP	Proposed risk-mitigation measures
12	Results do not reach the market	WP5, WP6	Industrial partners are strongly committed to innovate and bring their products on the markets. The financials have been explored showing the proximity to the market. Support measures are also provided by elaborated business models. The management structures will guide the innovation process based on a continuous market analysis through the Road-mapping activities in WP6.