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Sun coupled innovative Heat pumps D8.7 – Final Stakeholders' vision document

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1 Introduction

Within the SunHorizon task 8.2 “Stakeholders engagement and events” is foreseen the organisation of stakeholders’ groups and events to continuously disseminate the SunHorizon objectives and results from perspectives out of the SunHorizon consortium. One stakeholders’ group is dedicated to the solar sector and one for the heat pump sector. The former group is being coordinated by CEA with an intensive participation in the IEA SHC task60 PVT applications to generate knowledge on this topic, models and insights that can be shared with stakeholders. The second group, heat pump sector, is being coordinated by CARTIF. Both groups are supported by EHPA and RINA on task T8.2.

All the consortium has been inquired and encouraged to provide and support the stakeholders mapping activities. This D8.7 report describes the activities to constitute and animate the SunHorizon stakeholders’ group from September 2020 to March 2021, towards SunHorizon Replication.

Heat pumps are part of the technology combinations of the project, which covered a wide range of heat pumps: adsorption (from the provider Fahrenheit), vapour compression (from the provider BDR) and gas-driven thermal heat pump (from the provider BoostHeat). These heat pumps are combined with solar technologies to enhance the operation of the system’s efficiency, and can help on providing the needed heating and cooling needs without relying in fossil-fuels. Energy utilities such as Energy Service Companies (ESCOs) can help on promoting the use of heat pumps, as they can act as Heating as a Service (HaaS) provider or through Energy Performance Contracts (EPCs), by financing, designing and operating the installations in the building sector.

The stakeholders’ engagement strategy for the SunHorizon project is composed by different steps, as follow:

1. creation of a sign-up page on the project website (<https://sunhorizon-project.eu/sign-up/>),
2. creation of a database with the subscribed stakeholders,
3. creation of ad hoc campaigns on social media to promote the T8.2 activities and the subscription as stakeholders,
4. create ad hoc newsletter/email for the stakeholders, keeping them informed on the project activities,
5. organisation of the second stakeholders workshop dedicated to ‘Heat pumps manufacturers and Energy Utilities’.
6. share the material of the event and present the forecast activities related to T8.2 to them.

Dissemination of the presentations and video recording of the event, on the SunHorizon platforms (social media and website).

7. Questionnaire survey and survey campaign circulated among all the stakeholders engaged and promoted via social media, to collect relevant insights on innovative H&C solutions for buildings.

2 Stakeholders platform update

The consortium has been active since the beginning of the project in engaging with external stakeholders to sign up on the newsletter and to join SunHorizon's stakeholders' workshops and other events.

The stakeholders' platform on the website can be seen in Figure 1 and the support letter can be seen in Figure 2.

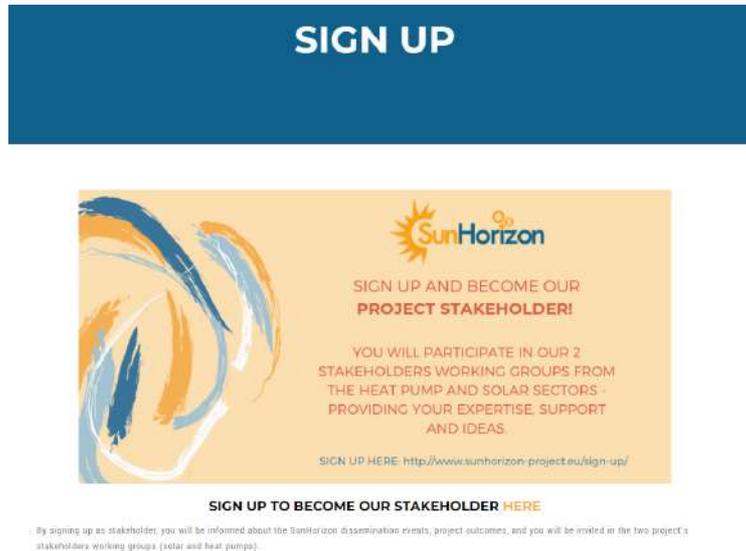


Figure 1: picture of the stakeholders' platform in the website



Figure 2: picture of the sign-up format

Since the creation of the stakeholders' platform on the project website, we have collected up to February 2022 the subscription of 70 people (from 65 different organisations), both from the solar and Heat Pump sectors.

Hereafter the full list of companies and organisations registered as stakeholders in the SunHorizon database:

1. AMPERE POWER ENERGY S.L.
2. Area cooling solutions
3. asdf
4. Aspiration Energy Private Limited
5. ATLANSUN
6. AZUR SYSTEME SOLAIRE

7. BATIRAMA
8. BDR THERMEA GROUP
9. BlueTerra Energy Experts B.V.
10. CEIS
11. City of Niš
12. Climate Futures
13. Climatech limited
14. CRES
15. De Beijer RTB bv/SolabCool bv
16. Department for Business Energy and Industrial Strategy
17. Easy Smart Grid GmbH
18. EGEC - European Geothermal Energy Council
19. EHPA
20. EndeF Engineering
21. energy-serv
22. Enerplan
23. Eurac Research
24. EUREC
25. Euroheat & Power
26. European Copper Institute
27. GRE-Liège (Groupement de Redéploiement Economique)
28. GreenStorm Consultants
29. HEAT GmbH
30. Independent
31. INSA Lyon
32. Interreg France Channel England SunPeople project consortium
33. JKP Gradska toplana Niš
34. Jurmala District Heating Company
35. Kryvyi Rih National University
36. Laborelec s.a.
37. Maya Enterprises
38. MICROPLAN
39. NTB Interstaatliche Hochschule für Technik Buchs
40. PassivSystems Ltd.
41. Prime Laser Technology
42. SAGNIER ENERGIES
43. SARP Industries Pôle Centre-Est Méditerranée
44. Solar energies and strategies
45. Solar Heat Europe/ESTIF
46. Solar Tomorrow Inc.
47. Swedish refrigeration and heatpump association
48. Tarbiat Modares University
49. TECSOL
50. The University of Nottingham
51. Tweles Beteiligungsgesellschaft mbH
52. UCSA - UFFICIO COMUNE PER LA SOSTENIBILITA' AMBIENTALE
53. Université de Lille
54. Université de Perpignan
55. University of Bologna
56. University of catania
57. University of La Laguna
58. University of Stuttgart
59. University of Twente

- 60. upv
- 61. Veotherm
- 62. Vibhu Solar Energie
- 63. vivacitas homes
- 64. W/E consultants
- 65. XRG Consultants Inc.

The recruiting of new stakeholders is a constant priority for the development of T8.2, for this reasons EHPA periodically publish dedicated posts on social media and on the project newsletter to promote the stakeholders' engagement and platform.

See in Figure 3,4 some examples.



Figure 3: June's newsletter edition shared in twitter



Figure 4: SunHorizon engagement shared in twitter

To accomplish the first stakeholders' analysis, we organised the second stakeholder workshop involving heat pump manufacturers and energy utilities. A dedicated analysis of this event is provided in chapter 3.1.

3 Recruitment of heat pump stakeholders

The recruitment of heat pump and energy utilities' stakeholders have been performed through workshops, events and publication in REHVA journal.

On October 29th 2020, the SunHorizon project has been presented in the joint workshop “Renewable Heating and Cooling Solutions for Buildings and Industry” at the Sustainable Places conference. The workshop was held together with other fourteen H2020 EU-funded projects from the biomass, geothermal, solar thermal and heat pump sectors to discuss a common strategy for increasing the use of renewable energy technologies for heating and cooling for buildings and industry. The video can be seen in <https://www.sustainableplaces.eu/home/sp20-workshops-events/sp20-renewable-hc-solutions-for-buildings-and-industry-workshop/>.

On September 28th 2021, the SunHorizon project has been presented in the joint workshop “Renewable Heating and Cooling Solutions for Buildings and Industry 2.0” at the Sustainable Places conference (SP2021). The workshop was held together with the same partners than the session on 2020, but including solutions towards NZEB concepts and solutions addressing the envelope. The video of the joint workshop was shared in twitter after the event. <https://www.sustainableplaces.eu/renewable-heating-and-cooling-solutions-for-buildings-and-industry/>

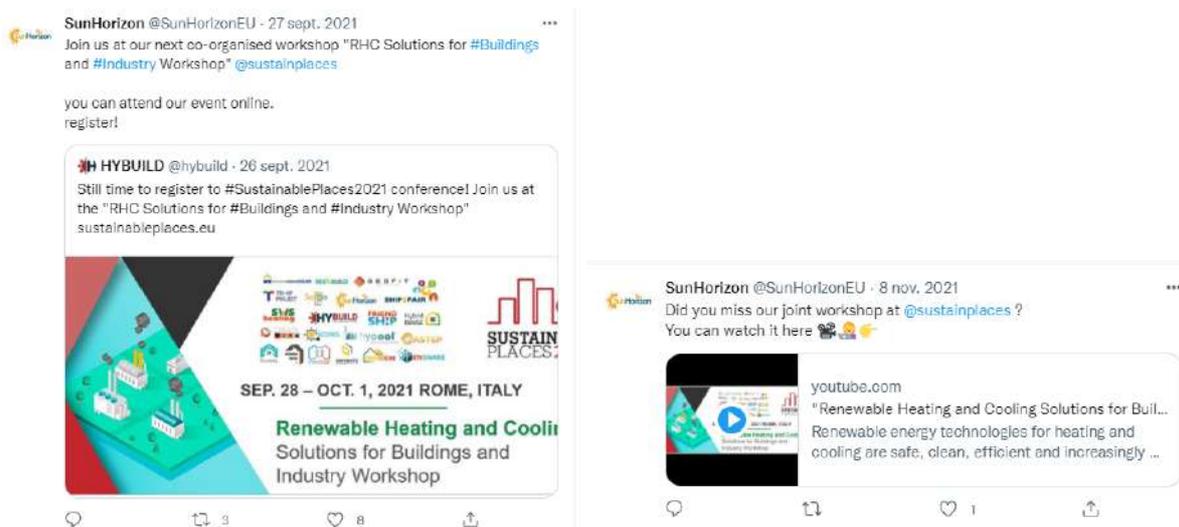


Figure 5: SunHorizon workshop in Sustainable Places (SP2021)

Furthermore, the SunHorizon partners (EHPA, RINA, CNR, CEA, CARTIF) published an article in the REHVA journal (bulletin October 2021), presenting the innovative 5 Technology Packages developed within the SunHorizon project, and explaining how the technologies will be performing in each of the 8 European demos. REHVA Journal is a technical, practical journal for the HVAC industry professionals. It is read by Designers, Consultants, Manufacturers, Investors, Mechanical Contractors, Sales and Representative Companies, Architects Energy sector's professionals, governmental institutions authorities, etc. It is open access, and can be accessed through: <https://www.rehva.eu/rehva-journal/chapter/default-cb84adc317-10>



Figure 6: Twitter post to promote the publication in REHVA Journal

The article published on REHVA journal, has been shared in all SunHorizon platforms (website, social media) and newsletter.

Moreover, during the last European Summit and HP Forum (during 2021), EHPA directly engaged with stakeholders from the Heat Pump sector and disseminated the goals of the project. these were great opportunities to engage with the most relevant stakeholders from the European heat pump sector.

The international world of heat pumps gathers in Nuremberg on 26 – 27th October 2021. Prominent speakers and international decision-makers from the worlds of trade, industry and science will meet for this event. SunHorizon participated with a stand, see Figure 7.



Figure 7: Participation in the European Heat Pump Summit in October 27th 2021

Lastly, RINA participated in the “Green heating and cooling workshop: Heat Pump RD&I in EU Projects”, a shared workshop with REWARDHeat project was held on October 6th in 2021. The video of the meeting can be accessed through <https://www.youtube.com/watch?v=pfelOEmO-oY>



Figure 8: Green heating and cooling workshop: Heat Pump RD&I in EU Projects, Twitter post

The event aimed at presenting the most valuable EU projects and experiences putting Heat Pump at the centre of the energy transition. The event was organised in the framework of the HP Forum organised in Brussels by EHPA on the 29-30th of September 2021. More than 200 people registered to the event, and the main players from the heat pump sector attended the event.

The material showcased during the event and its video recording are accessible here: <https://sunhorizon-project.eu/green-heating-and-cooling-workshop-presentations-now-available/>

Especially for the organisation of the 2nd SunHorizon stakeholders workshop, EHPA made a strong use of its network (more than 2000 contacts) and membership in inviting them to participate in the SunHorizon meeting and sharing the project’s achievements and heat pump innovation.

3.1 Second heat pump stakeholder workshop- 12.05.2021

The second stakeholders’ workshop has been focused on heat pump (HP) technologies and innovation in this field within SunHorizon project. Furthermore, the ESCO perspective was given to share the business models associated with HPs. The event, under the organization of CARTIF, EHPA and RINA-C has been structured with the following agenda.

| Agenda |
|---|
| <p>“Working towards the same mission with innovative heat pump solutions”</p> <p>Subtitle: SunHorizon in the context of Horizon Europe</p> |
| <p>12th of May 2021, on Zoom.</p> |
| <p>Welcome speech by Serena Scotton (EHPA), presentation here</p> |
| <p>“Introduction to SunHorizon 5 innovative Technology Packages”, by Andrea Gabaldon Moreno (Cartif), presentation here</p> |

“EU heating and cooling policy & EHPA priorities 2021”, by Jozefien Vanbecelaere (EHPA), presentation [here](#)

SunHorizon heat pumps technology presentations:

“Solar hybrid Heat Pump” from BDR THERMEA, by Sébastien Vacher, presentation [here](#)

“Natural gas driven Heat Pump” from BoostHeat, by Norbert Dischinger, presentation [here](#)

“Hybrid adsorption/compression chiller” from Fahrenheit, by Bashir Kanawati, presentation [here](#)

“SunHorizon business models and ESCO’s perspective”, by Josep Mitats Carmona (Veolia), presentation [here](#)



Figure 9 banner and communication of the event

We aimed at providing to the participants a general overview of the SunHorizon project and all technologies involved in the project, but focusing on the heat pump perspective and energy performance increased thanks to the application of the technology packages in the demo sites. SunHorizon technology packages were presented, which combine different innovative heat pumps with solar and a stratified storage that is able to maximize the use of solar, instead of simply dump and take energy from the ambient. The following advantages were presented:

- The combination of heat pumps with solar allows to increase the efficiency, and the use of solar
- The good thing is that is sold as a package and it has been studied to optimize the sizes and the control settings
- Furthermore, most of the technology packages are going to use natural refrigerants, which are in line with F-GAS regulation

The workshop was held online, its recording has been shared within the participants and on the SunHorizon channels (LinkedIn, Twitter, YouTube, website) as well as all the other presentations. The recording of the session can be found [here](#)

The workshop was attended by 60 participants, and there were 120 people registered to the event. After the event all the materials were shared among the attendees.

3.1.1 Insights about external speakers' presentations

The presentation about “EU heating and cooling policy & EHPA priorities 2021”, provided by Jozefien Vanbecelaere (EHPA), available [here](#), focussed on providing inputs on the main EU dossiers and how they are influencing the current EU heat pump market.

More into details, Jozefien provided inputs on the current EU heat pump market trends (figure 9), and how the energy goals set by policy makers will allow to reach up to 60 million of Heat pump units in Europe by 2030 (Figure 10). Among market trends, Jozefien presented an overview of the main EU policy dossiers and how they are impacting the heat pump sector (see Figure 9 for a full list).

Jozefien stated that heat pumps are now recognised at EU level as important technology to achieve Europe’s energy and climate targets. Jozefien presented the role of heat pumps in the EU integration strategy and renovation wave. Some of the participants raised questions about the different taxation among electricity and natural gas prices and taxes, especially referred to the residential sector.

market growth '05 – '20 | HP stock²⁰²⁰: 14.8 mill. installed

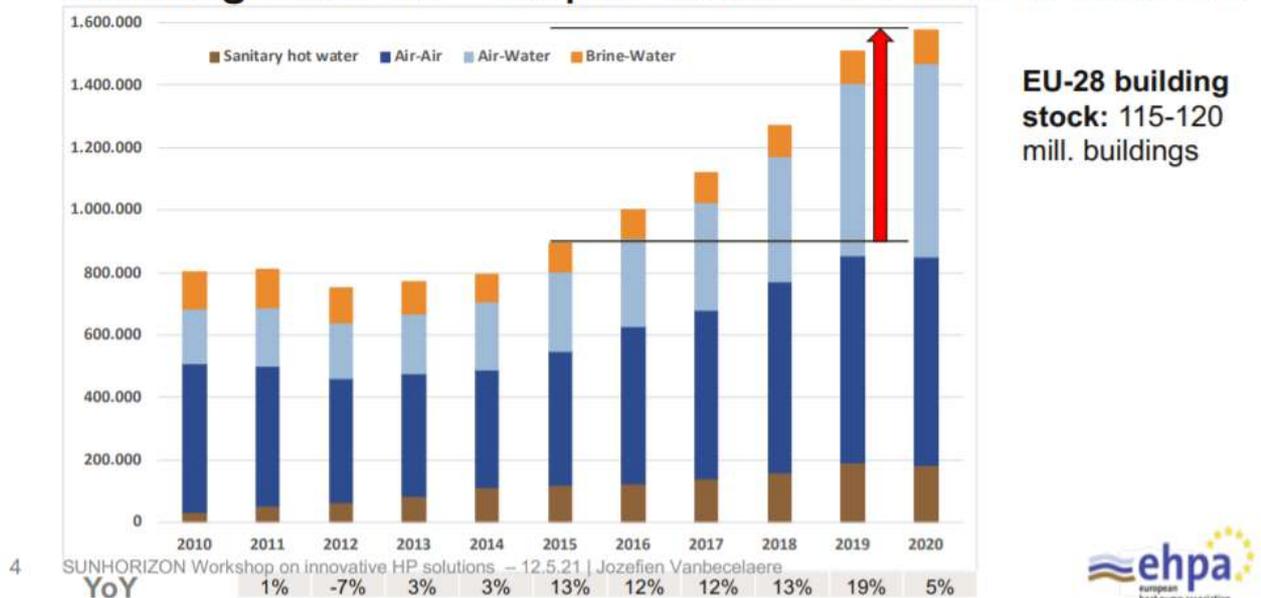


Figure 10 Heat pump market's trends in Europe

Legislation covering Heat Pumps

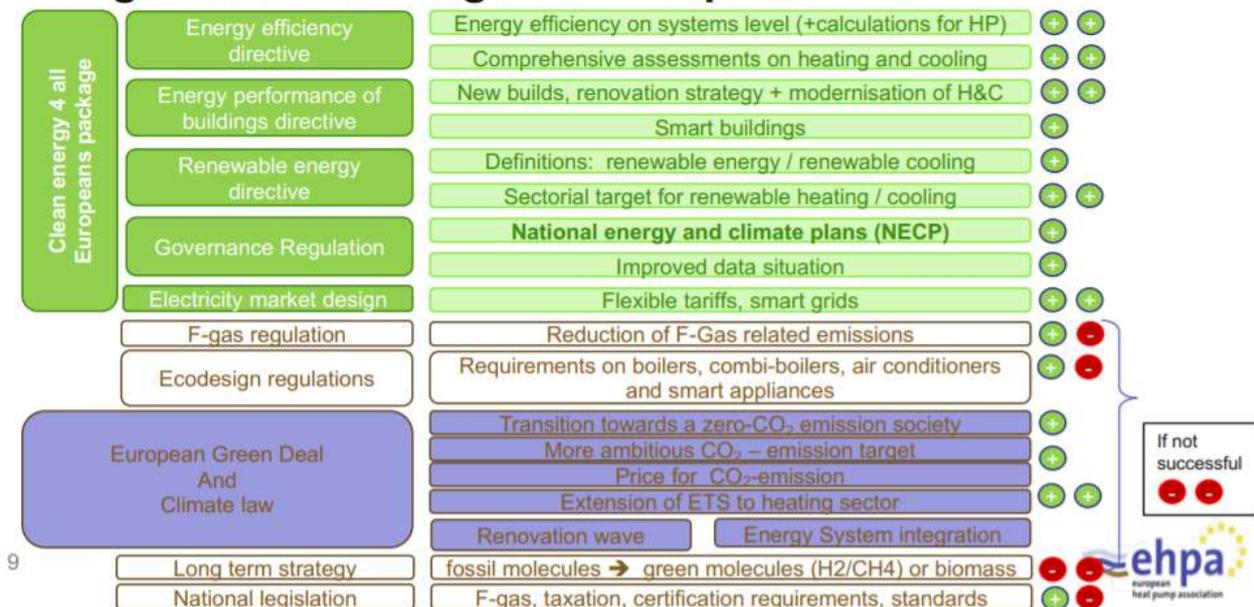


Figure 11 list of main Eu policy dossiers presented

The following questions were addressed:

- what is the difference between SunHorizon technology packages and conventional technologies on the market?
- What is your personal expectation on the future of heat pumps and how SunHorizon can contribute to it?
- What is the main barrier you are facing in the technology package implementation?
- what are the expectations for the future replication of SunHorizon technology packages?

The conclusions were:

- The expectation is that if in the future, RES will increase in the power grid system, the electricity costs is expected to down and the SunHorizon technology packages will be more competitive compared to gas-fired systems. Industry can deliver heat pumps but, «We need framework conditions, that trigger end-user demand» and stop fossil fuel subsidies. For instance, as gas is still cheaper than electricity cost and the dwelling owners want to prioritize the reduction of bills costs, that means that the gas-fired systems are prioritized instead of electricity-driven systems.
- The expectation is that heat pumps will play a much greater role in the energy systems, whether they are used in district heating and cooling networks or use for demand response programmes in the electricity grid. Furthermore, cooling demand is expected to grow and people have more climate awareness and therefore with more willing to change to fossil-fuel free solutions, so heat pumps will be the main technology to supply that. SunHorizon technology packages could be a solution in these cases as they lower the emissions compared to conventional solutions, are optimized, and as they are combined with solar the performance is higher.

3.1.2 Stakeholders' workshop outcomes

This workshop was a great opportunity to present the SunHorizon TPs and heat pump innovation to an extended audience of experts from the heat pump and ESCOs sector. Thank to this event we manage to have direct feedback from the external audience on the goals set by the project, innovation of our TPs, and social and economic impacts.

In both stakeholders' workshops organised, we had active engagement with the audience, and we manage to have a concrete feedback on our technological and social offer.

The inputs are taken into consideration for the development of further communication and dissemination activities.

To investigate the level of satisfaction among the stakeholders who attended the webinar, a survey post event has been shared. In the survey we asked about the level of satisfaction within the presentations, which were considered the most interesting topics, if they will attend in other similar events in the future and if they had any suggestions to be share.

3.1.2.1 Surveys on regulatory framework for standardization and certification of SunHorizon technologies

In Work Package 7, Task 7.4 – “Regulatory and non-technical framework: standardization and certification pathway”, RINA has carried out two surveys addressed to stakeholders and technology providers (e.g.: partners involved in SunHorizon). The scope of these surveys is to identify, by means of questionnaires, standardization and certification pathways and non-technical barriers for market entry of SunHorizon technologies.

Specifically, as regards:

- Stakeholders’ survey: questionnaire is aimed at investigating their perception about SunHorizon technologies (heat pumps and solar thermal integration) as potential turnkey technologies of new Heating & Cooling (H&C) sector.
The final scope is the identification of regulatory and non-technical framework for standardization and certification of SunHorizon technologies and to identify non-technical aspects that may pose limitation to market entry, including legislative/regulatory restriction, if any, and how to overcome the barriers;
- Technology providers’ survey: questionnaire aims at supporting the analysis of regulatory and non-technical framework for standardization and certification of SunHorizon technologies, based on the inputs of the technology providers.

The results of these surveys will be included in deliverable D7.7 - “Report on standardization and non-technical barriers” (Task 7.4).

4 Stakeholder engagement in 2022 onwards

For the next two years of the project, the stakeholders' engagement will be continuously strongly enhanced, thanks to project partners, to present project's results from the demonstration campaign, the validation of the tools developed within the project and received insights from different stakeholders (ESCOs, HP manufacturers, etc.)

The project will be disseminated through events and conferences, such as CLIMA 2022 the 14th REHVA HVAC World Congress, which is the leading international scientific congress in the field of heating, ventilation and air conditioning (HVAC) that will happen on 22nd – 25th May 2022 in Rotterdam (The Netherlands). An abstract has been submitted to present the preliminary results of the proactive maintenance tool and the advance efficient controller, that is applied to the solar-driven heat pumps technology packages. This will allow to continuously disseminate the results and engage with stakeholders.

Conclusions

So far SunHorizon has succeeded in constituting and engaging with the stakeholder group dedicated to the heat pump sector as well as with the one dedicated to the solar sector. Following an already established stakeholder's engagement strategy composed by several steps - such as the creation of a sign-up page on the projects website, adhoc campaigns on social media to promote the subscription of stakeholders, the organisation of a second stakeholder event dedicated and "Heat Pump manufacturers and Energy Utilities", etc.- the project has actively disseminated SunHorizon objectives and set a solid base for SunHorizon Replication.