Renewable Heating & Cooling

European Technology and Innovation Platform

Final RHC-ETIP expert information material

Deliverable 2.4

WP2 – T2.2

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Prepared by: Andrej Mišech (EUREC)

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ABBREVIATIONS

RHC ETIP: European Technology and Innovation Platform on Renewable Heating and Cooling

RHC: Renewable heating and cooling

SRIA: Strategic Research and Innovation Agenda

HWGs: Horizontal Working Groups

TPs: Technology Panels

PARTNERS

EUREC: the Association of European Renewable Energy Research Centres

BE: Bioenergy Europe (formerly known as AEBIOM)

EGEC: the European Geothermal Energy Council

EHP: Euroheat &Power

SHE: Solar Heat Europe (formerly known as ESTIF)

EHPA: European Heat Pump Association

TABLE OF CONTENTS

1. Introduction

Deliverable 2.4 "Final RHC-ETIP expert information material" presents the RHC-ETIP publication "Strategic Report on Implementation of Research and Innovation Priorities and Deployment Trends of the Renewable Heating and Cooling Technologies" (generally known as the Deployment and Implementation Report (DIR)), and explains the methodology and the process followed to draft and finalise the document. This report also briefly summarises the process of updating the previously published SRIA with reference to technology specific SRIAs. The DIR was developed between December 2020 and October 2021 with contributions from RHC stakeholders, as well as RHC-ETIP Horizontal Working Groups´ and Technology Panels´ experts and the RHC-ETIP secretariat. Chapter 2 provides details on the key actors involved, the methodology adopted, the main steps of the process. Chapter 3 gives an overview of the structure of the document and the link to the publication. Chapter 4 provides details on the update of the previously published SRIA.

2. Process and methodology

2.1 Actors

The key actors involved in the process were:

- **RHC-ETIP members**: all RHC-ETIP members were offered the possibility to contribute to the DIR by completing the comprehensive survey as well as contribute via co-creation workshop organised in June 2021. Some of RHC-ETIP members were also invited for semi-informal interview to collect additional information on key questions. The feedback received was consolidated in the final document.
- **External stakeholders**: these external stakeholders include renewable & non-renewable heating & cooling stakeholders from national and European organisations who have an interest in H&C but are not directly represented in the RHC ETIP. External stakeholder included in the database of relevant stakeholders (see Deliverable 3.2) were asked to complete the comprehensive survey as well as contribute via co-creation workshop organised in June 2021. The feedback received was consolidated in the final document.
- **Horizontal Working Groups (HWGs)**: as presented in Deliverable 2.1 "Report on the kick-off meetings of the Horizontal Working Groups", in January 2019 four new working groups were created by the RHC-ETIP Board next to the Technology Panels (TPs). Their mission has been to address and identified challenges, opportunities and development potential of RHC technologies in 4 different areas of interest, respectively individual buildings (not connected to the gas grid or H&C networks), industries, districts and cities. These technology-related HWGs played a supporting role in the development of the DIR by preparing the guiding questions for the co-creation workshop, as well as a moderating dedicated breakout rooms during the co-creation workshop. HWG chairs were also key in drafting sections of the report addressing any missing R&I priorities in the SRIA.
- **DIR Working Group**: a temporary working group, called DIR Working Group, has naturally evolved from the SRIA Working Group and was set-up by the RHC-ETIP Board in October 2020 to review the contribution from RHC-ETIP members and external stakeholders, overview and coordinate the drafting of the DIR and ensure consistency throughout the document. This WG, composed of the chairs of all HWGs and the Chairs of Technology Panels and coordinated by EUREC, worked in parallel with the technical HWGs and played a strategic role to fine-tuning the final report.
- **RHC-ETIP Secretariat**: the secretariat provided support to the HWGs and the DIR WG to organise and manage meetings and conference calls. Each partner organisation of the secretariat has continued with its previously assigned role:
    - EUREC: support to the DIR WG and editing of the report;
    - Bioenergy Europe: support to Buildings HWG;
    - EHP: support to Districts HWG;

- EGEC: support to Cities HWG;
- SHE: support to Industries HWG;
- EHPA: providing further support to the DIR WG

- **Technology Panels (TPs)**: Technology Panels contributed to the report by reviewing the final draft.

2.2 Process

In October 2020, the Secretariat, supported by the RHC-ETIP Board and HWGs, kicked off the preparation of the Deployment and Implementation Report based on the agreed guidelines, and scope. Between October 2020 and January 2021, the secretariat conducted internal brainstorming on how to best finetune the process to collect relevant input. The Secretariat organised two internal coordination meetings in November and December 2020 to discuss and prepare the overall process and discuss the most suitable tools to use for data collection.

From January 2021 onwards, the coordination calls have been organised involving the DIR HWG on a monthly basis to review progress and discuss any issues. In January and February 2021, the secretariat has prepared the structure and drafted the survey. The survey was launched in March 2021 and remained opened for ca. 6 weeks to gather as many responses from the RHC-ETIP members and external stakeholders as possible. In May 2021, the analysis of survey responses started, coinciding with the start of interviews. These semi-structured interviews were organised between May and July 2021 and each secretariat partner conducted 2-4 interviews. Following the interview, output form has been completed by each partner and submitted to EUREC for inclusion in the report.

In June 2021, the co-creation workshop took place. This event aimed to collect additional input and enable RHC-ETIP members and external stakeholders to provide further feedback, input and clarifications towards the key questions. The workshop was structured according to the RHC-ETIP´s Horizontal Working Groups, whereas each participant selected which HWG breakout room she/he intends to participate during the workshop. In these breakout rooms, participants discussed questions prepared jointly by the secretariat and HWG chairs (see Annex II). Following the co-creation workshop, each Secretariat member responsible for supporting a given breakout room delivered reviewed breakout room template with contributions from participants for inclusion in the report.

Between July and September 2021, EUREC, in its position of scientific coordinator, analysed all submitted inputs and drafted the first version of the DIR, which was periodically reviewed by the Secretariat and by the DIR HWG.

The final version of DIR was approved by the RHC-ETIP Board at the beginning of October 2021. In the following weeks the final text was thoroughly proof-read to eliminate all typos and mistakes, while EUREC worked with the graphic designer to define the final layout of the publication. The DIR was

published on the RHC-ETIP website to coincide with its official presentation at the RHC-ETIP annual conference – 100% RHC EVENT 2020 (online) on 28 October 2021.

2.3 Methodology

Drafting the DIR was a long process characterised by multiple interactions. Large number of stakeholders was involved in the process at different stages, in order to ensure the development of a comprehensive and accurate report.

To address the RQs listed above, a range of activities was conducted to gather data. This report used a qualitative assessment and verification of data analysis method to achieve its objectives. The process comprised of:

1. An extensive online survey, targeted at members of the RHC-ETIP platform and Secretariat partners´ members, to provide an EU-wide view of the implementation of RHC technologies and overall trends in terms of RD&I funding, cooperation, policy, challenges, and barriers. The survey consisted of 4 main parts:
    - General information;
    - Monitoring the implementation of the RHC Strategic Research and Innovation Agenda priorities;
    - RD&I trends among RHC stakeholders;
    - Policy and miscellaneous.
2. Semi-structured interviews, targeted at stakeholders not covered by the survey and aligned with its structure. This served to gather additional inputs on the RD&I activities and associated current and future trends.
3. Co-creation workshop gathering stakeholders across the different RHC technologies aimed at validating data collected via survey and interviews. This provided space to further discuss current trends in the RHC sector and deployment of RHC technologies in Europe.

Activity	Online survey	Interviews	Co-creation workshop
No. of inputs (i.e. participants)	94	14	82

Table 1 - Overview of data gathering activities and related number of participants

Based on the data gathering activities, the editing team synthesised all data captured and conducted in-depth analysis to pinpoint past, present, and future trends related to RHC stakeholders and their RD&I activities.

Limitations

Producing this report entailed the challenging exercise of collecting scattered data and extrapolating greater industry trends based on the microcosm of contributing stakeholders. A number of caveats, limitations, and assumptions should be considered in relation to the findings of this report. Firstly, the H&C sector is highly heterogenous, encompassing stakeholders across the value chain, while this

report draws on insights from a limited number of stakeholders. However, this limitation was countered by cross-checking collected data with the collected inputs across different stakeholder engagement and data gathering activities. Secondly, trends in the RHC sector are inherently tied to national (and supranational) policies and regulations which are impossible to predict with certainty. Nevertheless, the findings presented here should not be interpreted as predictions of specific future scenarios, rather should offer insights into the main trends, challenges, and opportunities of the RHC sector. In this way, relevant decision-makers should be better able to design forward-looking policies and investment strategies. Thirdly, the quality and quantity of the data submitted through the RHC stakeholder survey is dependent on the time and effort stakeholders could devote to its completion. This occasionally led to brief explanations for qualitative questions or more concise responses to complex aspects of the RHC sector, related technologies, and associated RD&I activities.

3. Strategic Report on Implementation of Research and Innovation Priorities and Deployment Trends of the Renewable Heating and Cooling Technologies

3.1 Structure of the report

The DIR is organised in four chapters,

- **Chapter 1** – Introduction, scope and objectives, methodology and limitations, and structure
- **Chapter 2** – Monitoring the implementation of RHC SRIA priorities – analyses the implementation level of the RHC SRIA priorities across the Horizontal division
- **Chapter 3** – RD&I trends among RHC stakeholders – presents key findings and identified RD&I trends among RHC stakeholders
- **Chapter 4** – Recommendations & conclusions – presents key recommendations based on the findings and identified trends, formulating policy options for consideration by EU stakeholders and institutions.

The core report is accompanied by four technical annexes:

- **Annex I** provides a list of stakeholders who contributed to the strategic report
- **Annex II** provides a detailed overview of the survey process and template used
- **Annex III** provides a detailed overview of the interview template with questions and topics covered
- **Annex IV** provides a detailed overview of the co-creation template with questions covered

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3.2 Accessibility

The full text of the DIR is publicly available on the RHC ETIP website at the following link: https://www.rhc-platform.org/content/uploads/2021/10/RHC-Report-MRes-1.pdf

It was decided that paper copies of the SRIA will only be produced at later stage, as there are no physical meetings or events being organised in the foreseeable future. Once available, paper copies of the DIR may be requested from the RHC-ETIP Secretariat by contacting info@rhc-platform.org

3.3 Visibility and dissemination

The RHC-ETIP Secretariat is strongly committed to disseminate the DIR. The DIR was officially presented at the RHC-ETIP annual conference – 100% RHC EVENT 2020 (online) on 28 October 2021. Moreover, the publication of the document was disseminated among platform members and external national and European stakeholders, as well as through social networks and press releases.

4. Update of the Strategic Research and Innovation Agenda for Climate-Neutral Heating and Cooling in Europe

4.1 Summary

RHC-ETIP consists not only of Horizontal Working Groups, but also five technology panels. These technology panels are pools of experts in charge of providing specific technology input, including for strategic documents such as SRIA. These technology panels also have their technology-specific SRIAs, which provide more detailed research and innovation priorities focused on the given technology. It was decided that RHC-ETIP SRIA should include references to these technology specific SRIAs to enable reader access to more generic R&I priorities as well as more detailed ones.

At the time of the update (March 2022), the following RHC-ETIP Technology panels have published their technology-specific SRIAs: Strategic Research Agenda for Geothermal Technologies (July 2020) Strategic Research and Innovation Agenda for District Heating & Cooling and Thermal Energy Storage

Technologies (April 2021) Strategic Research and Innovation Agenda for Heat Pumps: Making the technology ready for mass deployment (May 2021)

4.2 Accessibility

The full text of the updated SRIA is publicly available on the RHC ETIP website at the following link: https://www.rhc-platform.org/content/uploads/2020/10/EUREC-Brochure-RHC-SRI-06-2022-WEB.pdf

The full texts of technology specific SRIAs are also publicly available on the RHC ETIP website at the following links:

- Strategic Research Agenda for Geothermal Technologies - https://www.rhc-platform.org/content/uploads/2020/09/Geothermal-SRIA-2020-v.3-FINAL.pdf
- Strategic Research and Innovation Agenda for District Heating & Cooling and Thermal Energy Storage Technologies - https://www.rhc-platform.org/content/uploads/2021/06/DHC-SRIA-FINAL.pdf
- Strategic Research and Innovation Agenda for Heat Pumps: Making the technology ready for mass deployment - https://www.rhc-platform.org/content/uploads/2021/06/RHC-ETIP-SRIA-HPs-2021v02-WEB.pdf

It was decided that paper copies of the updated SRIA will only be produced at later stage, as there are no physical meetings or events being organised in the foreseeable future. Once available, paper copies of the DIR may be requested from the RHC-ETIP Secretariat by contacting info@rhc-platform.org

Annex I – Outline of the Deployment & Implementation Report

Strategic Report on Deployment of R&I Priorities and Implementation Trends of RHC Technologies

OUTLINE

1. EXECUTIVE SUMMARY

2. INTRODUCTION

This section introduces the document, methodology, as well as outlining the need for a inquiry into the implementation of RHC-SRIA priorities and RD&I activities of RHC stakeholders in general.

i. Objective(s) of the report
ii. Methodology
iii. Structure

3. MONITORING THE IMPLEMENTATION OF THE RHC SRIA PRIORITIES

This chapter offers an analysis of implementation level of the RHC-SRIA priorities across the five groups: cross-sectoral, buildings, districts, cities and industries. For each group, it is highlighted whether the RHC-SRIA priorities are being implemented, to what level, whether a priority is deemed important or not and whether there are any RD&I priorities missing in the RHC-SRIA. [Questions to be answered: To what extent is the RHC-SRIA being implemented and by which stakeholders? Are there gaps in the current SRIA? Any areas not covered in SRIA or vice-versa by the private companies active in RHC? What are the reasons for these gaps?]

i. Context
ii. **Implementation – Key findings**
    a. **Cross-cutting priorities**
    b. **RHC in Buildings**
    c. **RHC in Districts**
    d. **RHC in Cities**
    e. **RHC in Industries**
iii. Implementation – Issues and obstacles

4. RD&I TRENDS AMONG RHC STAKEHOLDERS

This chapter offers an overview of findings and identified RD&I trends among RHC stakeholders. The aim is to find out what RD&I activities are stakeholders currently working on; what is the objective of their RD&I activities and what affects formulation of the RD&I activities; are the identified changes in line with the RHC-SRIA priorities; what is the budget for these RD&I activities and is it increasing or decreasing.

i. **Context** [incl. Caveats to Interpreting Trends]
ii. **Key findings** [incl. nature of on-going RD&I activities; level of research cooperation, sources of funding, policy drivers and barriers for RHC, etc.]
    - Funding going towards RD&I, its sources and the overall trend
    - TRL, RD&I objectives and the overall trend
    - RD&I cooperation and the overall trend
    - Policy frameworks affecting RD&I and the overall trend
iii. **Issues and obstacles**
    - Internal/external factors affecting RD&I
    - Barriers affecting the update of RHC

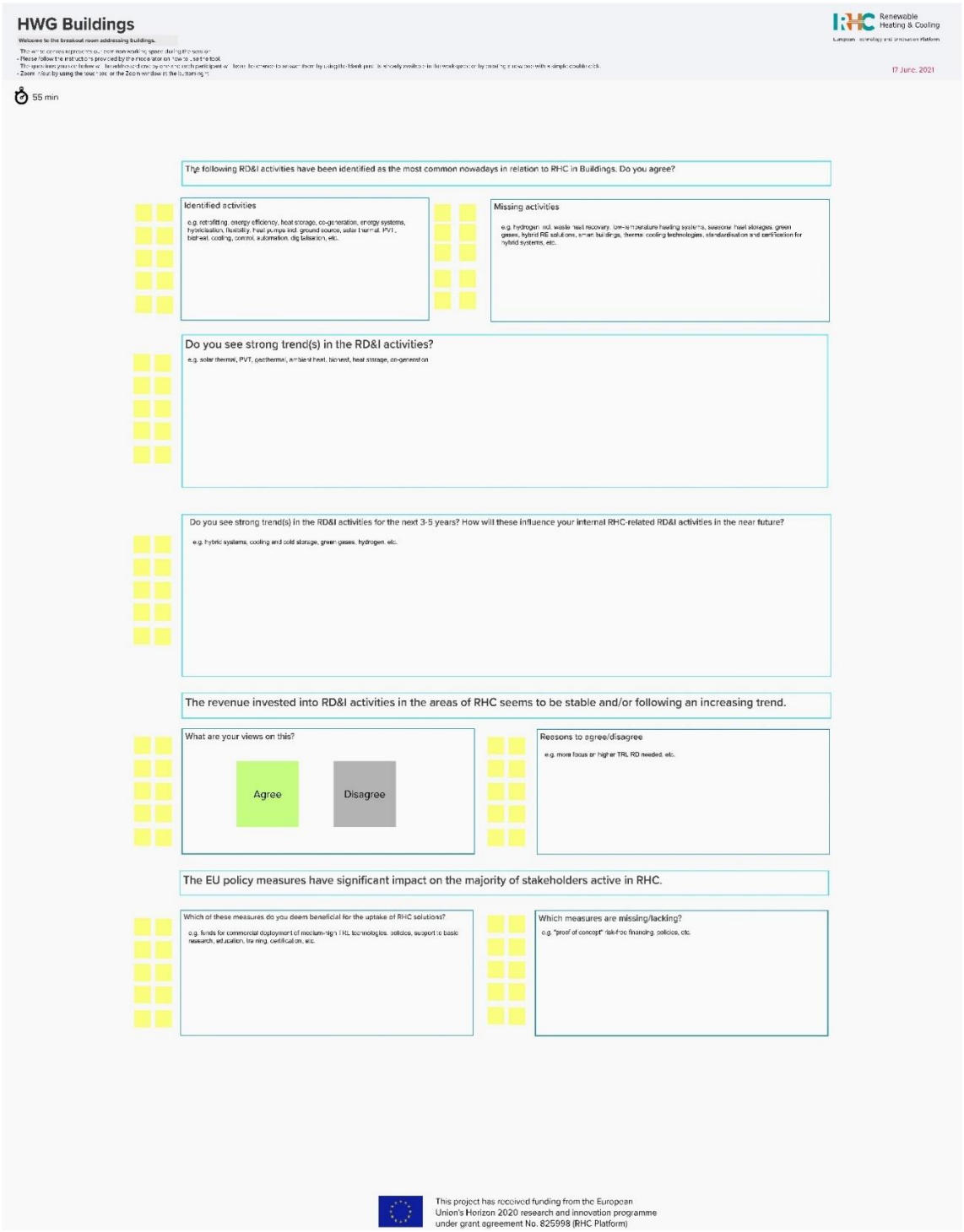
5. RECOMMENDATIONS & CONCLUSIONS

i. **Recommendations concerning the further implementation of RHC-SRIA priorities**
ii. **Closing remarks**

Annexes

i. **Survey template**
ii. **Interview template**
iii. **Co-creation workshop discussion template**

Annex II - Co-creation Workshop Mural Template



Annex III – Interview template

Country
Respondent is ...
- Selling/developing RHC technologies - Purchasing/using RHC technologies - Other (please specify below)
Indicate under which horizontal RHC sector(s) would you categorise the activities of the respondent (you can choose more than one):
- Buildings - Districts - Cities - Industries
What percentage of respondent's current production/development/use can be characterise as falling under renewable heating and/or cooling category?
%
Company name:
Respondent wishes the name of the company to be listed in the final report among other entities that completed this survey.
Yes/no
Number of employees (estimate):
Respondent´s e-mail address (if they wish to disclose and receive the final report)
Is the respondent a member of the European Technology and Innovation Platform on Renewable Heating and Cooling (RHC-ETIP)?
Yes/no

Annex IV – List of companies contributing to the preparation of the report

Contributing to the survey:

- Glayx
- Tekniker
- Riello S.p.A.
- North-West Croatia Regional Energy Agency
- Rioglass Solar
- Vattenfall Wärme Berlin AG
- Fiera Group and Heat Plus Pump
- University of Catania
- StepsAhead Energiesysteme GmbH
- EEI Energy Technologies
- Northern Ireland Housing Executive
- Terawatt Ireland
- CRES - Centre for Renewable Energy Sources and Saving
- netgreen.eu
- Swegon
- GEA GmbH
- Institute of Energy Systems and Environment, Riga Technical University
- Polytechnic Institute of Setúbal
- SPIUG (Assocuation of Heating Appliances Producers and Importers in Poland)
- Mirai Intex
- Stiebel Eltron
- THERMOWATT Kft.
- UGI
- Limerick Institute of technology
- ENGIE
- Colterm Timisoara SA
- solrico
- Cyprus Union of Solar Thermal Industrialists
- Ingenieurbüro Solar Energie Information
- PLEION SRL
- ASIT
- Tangente
- CRES

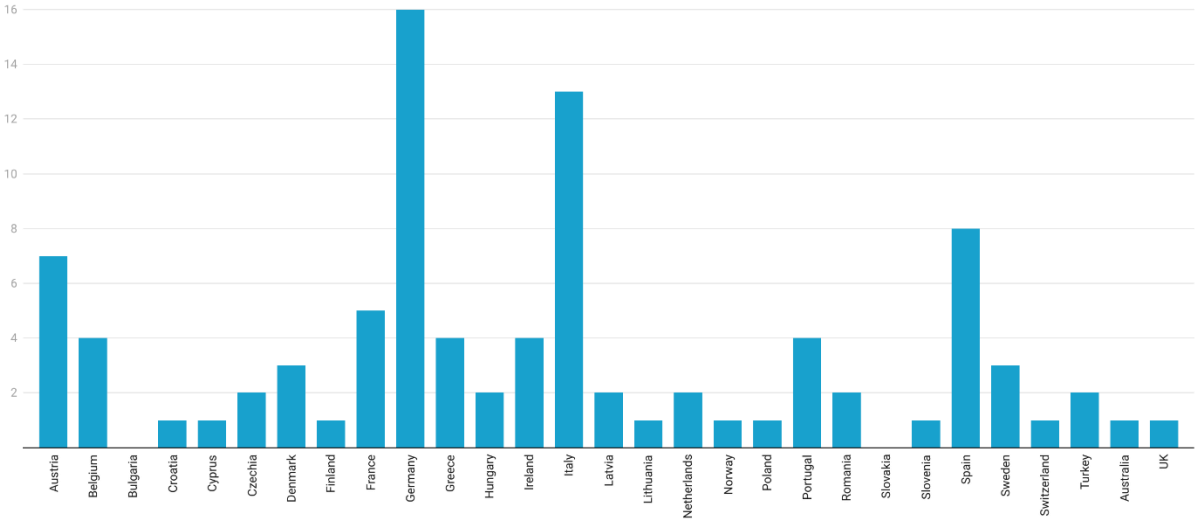
- AES Solar
- Creaspin
- University of Cordoba
- Czech Technical University
- ZAE Bayern
- Technische Universität Berlin
- AIT - Austrian Institute of Technology GmbH
- MG SUSTAINABLE ENGINEERING AB
- Absolicon Solar Collector AB
- Technische Universitaet Berlin (Chair for energy conversion technology)
- Stadtwerke Kempen GmbH
- Consiglio Nazionale delle Ricerche - Istituto di Tecnologie Avanzate per l'Energia (CNR ITAE)
- Dr. Jakob energy research GmbH & Co. KG
- Ecotherm Austria GmbH
- GREENoneTEC
- CREVER research group/ Univestat Rovira i Virgili
- Prime Laser Technology
- SOLID Solar Energy Systems GmbH
- PlanEnergi
- LaSalDeLaTierra, S.L.
- Technical University of Denmark
- TVP Solar
- Heliac
- TEKNIKER
- ENERGAID s.r.l.
- University of Bologna
- Chalmers University of Technology
- Clin
- Conversio GmbH
- Technical University of Cluj-Napoca
- CEE-Engineering

Contributing to the interviews:

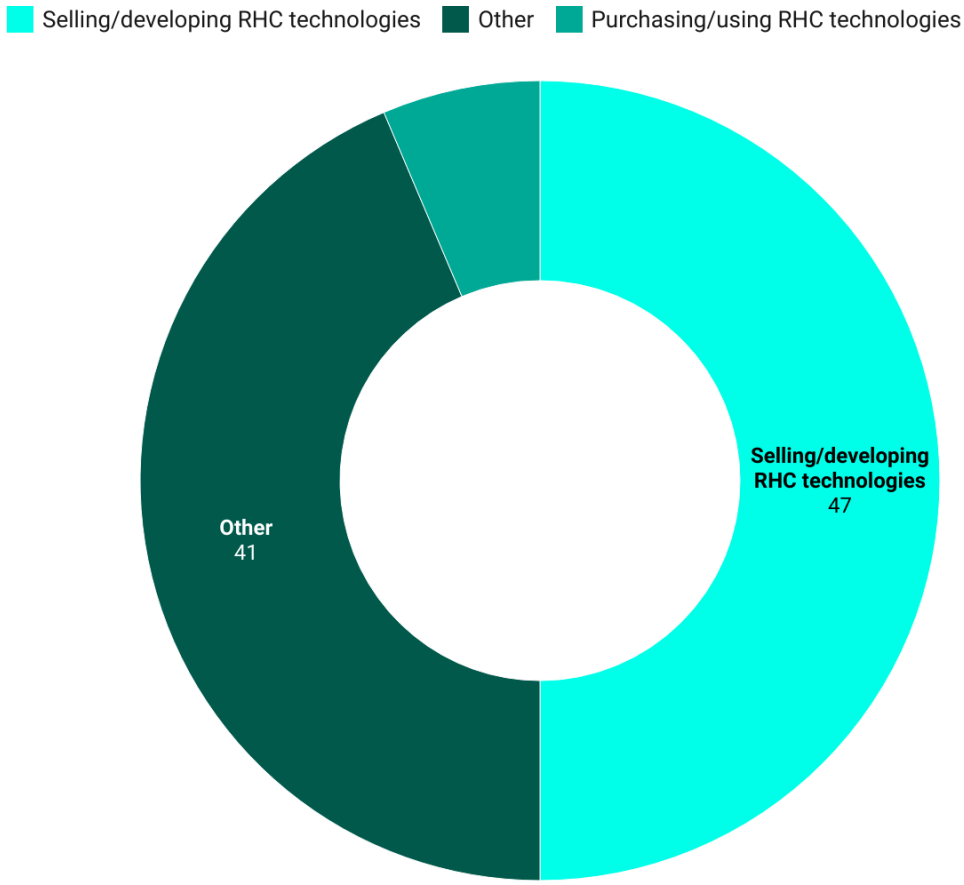
- Easy Smart Grid (DE)
- INEGI – Institute of Science and Innovation in Mechanical and Industrial Engineering (PT)
- Dalkia (EDF) (FR)
- EWE (DE)
- Norsk Fjernvarme (NOR)
- SOLID (AT)

- MegaWatt Solutions Nordic AB (SWE)
- Vulcan Energie Ressourcen GmbH (DE)
- IF Technology (NL)
- GPC INSTRUMENTATION PROCESS (GPC IP) (FR)
- COMPTE.R Biomass Boilers (FR)
- PALAZZETTI LELIO SPA (IT)
- Ritter Energie (DE)
- Dual Sun (FR)

Number of participants per country



Share of participants per sector



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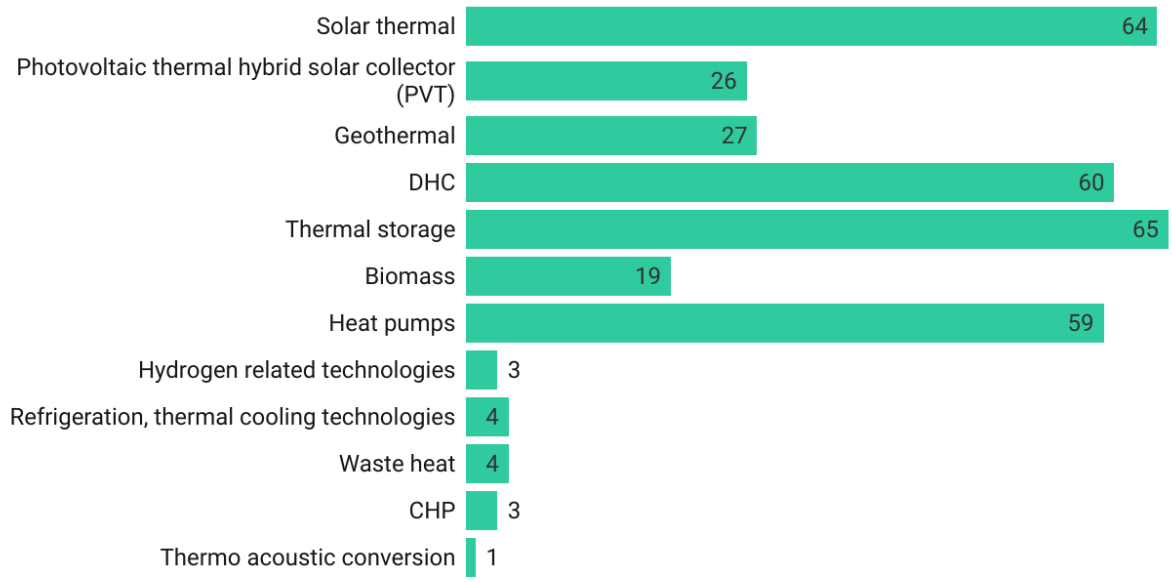
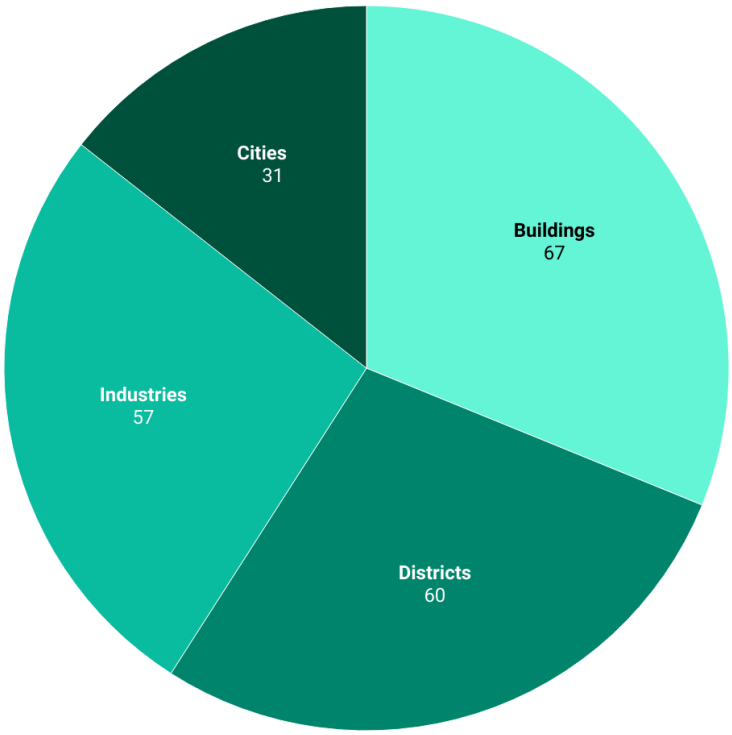
Share of participants per technology



Share of participants per horizontal sector



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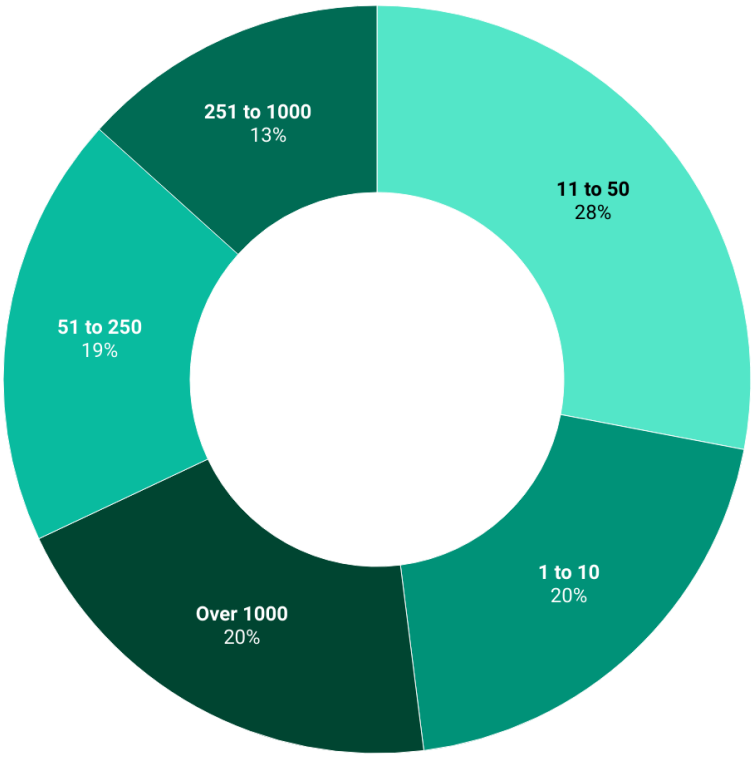
Share of participants´ companies per number of employees



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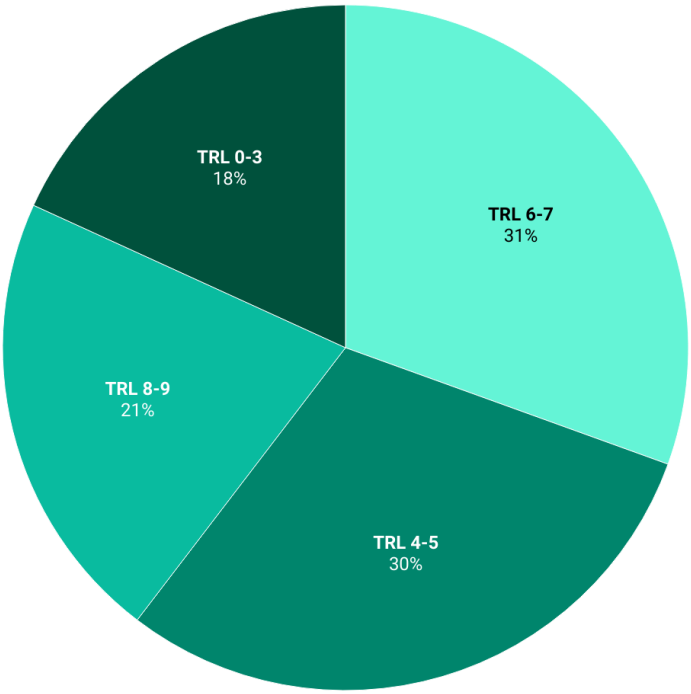
TRL levels of RHC RD&I activities conducted in 2020 (as reported)



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Annex V – Survey to stakeholders

The objective of this questionnaire is to obtain an implementation status of the Renewable Heating and Cooling Strategic Research and Innovation Agenda´s priorities among the RHC stakeholders; as well as identify the RD&I trends among the stakeholders active in the Renewable Heating and Cooling sectors.

Why is this important?

Your answer remains important so as to form a correct and complete picture of all the RHC sectors in the EU. The European Commission can only take the right measures to stimulate these sectors when a complete picture is available. This survey is a mean for preparing a report for the European Commission on the status of RHC RD&I. Companies that provide answers will be in position to influence content of the report. Results of this survey will therefore be used to better define policy recommendations for the sector.

By completing this Survey, you will receive a digital copy of the final report with insights into RHC-related RD&I priorities and RD&I trends among the stakeholders active in the Renewable Heating and Cooling sectors.

Your information will be handled in strict confidence and used only for the purposes of the RHC-ETIP´s Deployment and Implementation Report. The collected data will only be displayed aggregated, in summary statistics, and/or used for the compilation of indicators.

Please complete this questionnaire, providing as much information as possible. If question does not apply to you, please write N/A (not applicable).

Section 1: General information

1 Country

- ○ Austria
- ○ Belgium
- ○ Bulgaria
- ○ Croatia
- ○ Cyprus
- ○ Czechia
- ○ Denmark
- ○ Estonia
- ○ Finland
- ○ France
- ○ Germany
- ○ Greece
- ○ Hungary
- ○ Ireland
- ○ Italy
- ○ Latvia
- ○ Lithuania
- ○ Luxembourg
- ○ Malta
- ○ Netherlands
- ○ Poland
- ○ Portugal
- ○ Romania
- ○ Slovakia
- ○ Slovenia
- ○ Spain
- ○ Sweden

2 I am a ...

(selection has impact on questions offered)

- ○ Selling/developing RHC technologies
- ○ Purchasing/using RHC technologies
- ○ Other (please specify below)

3 If you selected *Other* above, please specify

100 character(s) maximum

4 Indicate under which horizontal RHC sector(s) would you categorise your activities (you can choose more than one):

- ☐ Buildings

- [ ] Districts
- [ ] Cities
- [ ] Industries

5 Indicate which of the following RHC technologies are you working with (you can choose more than one):

- [ ] Solar thermal
- [ ] Photovoltaic thermal hybrid solar collector (PVT)
- [ ] Geothermal
- [ ] District heating & cooling
- [ ] Thermal storage
- [ ] Biomass
- [ ] Heat pumps
- [ ] Other (please specify below)

6 If you selected *Other* above, please specify

7 What percentage of your current production/development/use would you characterise as falling under renewable heating and/or cooling category?

8 Company name (if you wish to disclose)

9 I wish the name of the company to be listed in the final report among other entities that completed this survey.

- ( ) Yes
- ( ) No

10 Company website (if you wish to disclose)

11 Main clients

- [ ] Companies
- [ ] Households
- [ ] Utilities
- [ ] Cities
- [ ] Other (please specify below)

12 If you selected *Other* above, please specify

13 Number of employees (estimate)

14 Your email address (if you wish to disclose and receive the final report)

15 Are you a member of the European Technology and Innovation Platform on Renewable Heating and Cooling (RHC-ETIP)?

- Yes
- No

Please contact info@rhc-platform.org if you wish to learn more and/or become a member.

Section 2: Monitoring the implementation of the RHC Strategic Research and Innovation Agenda priorities

In 2020, **European Technology and Innovation Platform on Renewable Heating and Cooling** has published the **Strategic Research and Innovation Agenda (SRIA)**, which responds to the need for an update of the priorities identified in 2013 and the need to push RHC technologies to centre stage in order to achieve carbon-neutrality by 2050 at the latest. The document presents the main R&I priorities to overcome current and imminent societal, technological and industrial challenges facing RHC.

The sections below follow the structure of the SRIA document and summarise the main RD&I priority groups.

Section 2.1: CROSS-SECTORAL RESEARCH AND INNOVATION PRIORITIES FOR RHC

TECHNOLOGIES OF HEAT AND COLD STORAGE AND DISTRIBUTION

Developing and demonstrating energy storage and distribution solutions for heating, cooling and DHW production integrated with RES both in active and passive ways.

The solutions are expected to ensure some of the following positive impacts:

- Increase in the energy efficiency of buildings or industries
- Increase in the share of RES and the use of residual heat (e.g. in CHP systems)
- Contribute to the flexibility of the electricity networks
- Cost-effective
- Satisfied owners and end-users

1 Relevance of the topic to you

- Not relevant

- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

POLICY AND SOCIAL INNOVATION

A big political effort is needed to achieve 100% RHC in EU by 2050. RHC technologies are mature, commercially available, and market competitive already, and they will be continuously improved. However, without effective political support, the vision of 100% RHC in EU by 2050 will not become a reality.
Activities might include:

- Planning of national & local district energy plans as well as combining and implementing spatial planning and heat planning by municipalities
- Knowledge transfer and networking between cities
- Addressing stakeholders in specific target groups to combine all relevant knowledge on a regional level as well as provide capacity building and training for local politicians, decision makers, consultancies and advisers about the benefits of sustainable district energy solutions
- Defining measures to support local decision making for renewables instead of fossils
- Development in the are of social innovation: including open innovation & lead user innovation
- Development in the area of local energy markets for heating & cooling
- Development in the area of coupling of the thermal and electrical grid and inclusion of EV, energy storage (both thermal and electrical) and residual energy for local activity

1 Relevance of the topic to you

- Not relevant
- Moderately relevant

- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

DIGITALISATION, OPERATION AND SYSTEM FLEXIBILITY

Activities might include:

- Generation of Digital Twins and Autonomy
- Digital twins & optimization
- Controller-in-the-loop-testing
- IoT, AI & cloud services
- Short term forecasting
- Sector coupling and flexibility
- Interfaces between different control layers

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

INNOVATIVE FINANCING SCHEMES AND NEW BUSINESS MODELS

Activities might include:

- Alternative financing schemes
- Energy as a service
- Use of blockchain to record peer-to-peer energy exchanges
- Securitisation (boosted by the investors´ demand for green bonds aided by a taxonomy for sustainable finance set at EU level
- Leasing or contracting
- Green and public funds
- Bartering (i.e. commercial agreements between companies to develop the project without money exchange)

  Blending finance

1 Relevance of the topic to you

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

CIRCULARITY

Circularity is the cornerstone of a sustainable future and goes beyond materials. It includes efficient use of low-temperature or excess (waste) heat from industrial processes and commercial buildings (e.g. data centres and other urban infrastructure, such as sewage processing plants, that are currently in large part dissipated in the atmosphere or water) and residential buildings. This heat may be upgraded or supplemented with other RES for space heating and cooling, for example with heat pumps. The new underground thermal energy storage and heat pumps (UTES) systems offer the possibility to store industrial excess heat in the ground, near the surface. Direct renewable heat technologies are especially suitable in regions that have a seasonal peak in heating demand, which is usually met by fossil fuels.
Activities might include:

- Developing new concepts and valorisation pathways to tackle the question of circularity in heating and cooling
- Identifying the different value chains within different energy sectors, including products, by-products and waste streams.

1 Relevance of the topic to you

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of application?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

Section 2.2: RESEARCH AND INNOVATION PRIORITIES FOR RHC IN BUILDINGS

TOPIC 1: RE H&C TECHNOLOGIES AND SYSTEMS FOR COST-EFFECTIVE RETROFITTING OF BUILDING STOCK

1 Relevance of the topic to you

Possible technologies can include:

- Developing affordable, compact, highly efficient, easy to install, and intelligent renovation kits for replacement of traditional fossil oil- and gas-fired heaters, allowing ease of control, operation and maintenance. Features like air conditioning capacity or hybrid combinations with e.g. high temperature geothermal heat pumps or clean and efficient wood burning stoves may help to make new heating equipment smaller, allowing cost reduction. Renovation kits should include innovative energy storage.
- Pushing developments for achieving the economic breakeven point for serial renovation of buildings (i.e. renovating many similar buildings at once) earlier, through efficient prefabrication of elements and advanced HVAC capabilities.
- Empowering heat pump technologies regarding (a) capability for simultaneous heating & cooling, (b) higher efficiency, (c) use of refrigerants with low GWP, (d) as part of a renovation kit, (e) adaption to dynamic electricity tariffs and (f) hybrid combinations with CHP and micro-CHP systems.
- Optimising the system architecture for combination with new RE-sources allowing tri-generation of low temperature heat, cold and electricity, while considering the multi-level cost of electricity, heat and cold and the overall renovation cost, rather than just cost for the refurbishment of the H&C equipment. Coupling with new intelligent storage concepts is essential.
- Exploring and demonstrating new RES, which can act as heat source for more efficient sole-based heat pumps. The RE heat source should be (a) more efficient, e.g. higher source temperature and extraction power, (b) environmental-friendly, (c) ahead of today's earth collector and boreholes regarding approval, cost and installation time and (d) should allow free cooling instead of operation of a chiller.

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 2: RE H&C TECHNOLOGIES AND SYSTEMS FOR COST-EFFECTIVE RETROFITTING OF HISTORICAL AND SPECIAL BUILDINGS

1 Relevance of the topic to you

Possible activities might include:

- Mapping of historic buildings and characterisation of their H&C needs in order to explore the possibility for easy but effective integration of RES
- Development of solutions for integration of RE systems in historic and special buildings that do not compromise the value of the building, in terms of aesthetics and lifetime
- Evaluating available spaces and possibilities for energy storage systems, as well as possible energy efficiency measures in order to reduce energy demand of the buildings
- Identifying the stakeholders of the buildings and their information, and ensure their involvement and cooperation in the retrofitting process.
  Development and application of easy to use methods that allow evaluation of aesthetical impact of solutions with integration of RE in the façade in order that it can be accepted by stakeholders.

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 3: RE SOURCES, TECHNOLOGIES AND SYSTEMS FOR NEW BUILDINGS AND THEIR INTEGRATION AND EXTERNAL CONNECTIVITY

1 Relevance of the topic to you

This might include technologies and combinations of technologies for buildings such as:

- Further integrating RE systems (solar thermal and PV or PVT) in the building envelope (façade), and new system architectures for using PVT collectors for the generation of electricity, heat and cold
- New solutions for heat pumps and their integration with RES in building thermal envelopes
- Development of compact, affordable and easy to install H&C kits, e.g. heat pump + TS + control software for efficient use of low temperature heat
- Integration with geothermal heat sources like e.g. thermally activated Energy Sheet Piles
- Development of new biomass fuels (solid, liquid, gas) for existing or new technologies
- Development of new biomass heating technologies adapted to the needs of new buildings
- Optimised integration with the price signals on electricity market
- Considering alternative electricity production and storage solutions (e.g. fuel cells, vehicle-to-grid) and smart grid integration for demand response, peak-shaving and increased share of RE own-consumption
- RE CHP and CHPC integration, and heat and cold storage integration
- Increase of building automation through BMS (monitoring sensors, controls, actuators) and decision-making tools for optimum use of buildings/systems in terms of energy efficiency

- ◯ Not relevant
- ◯ Moderately relevant
- ◯ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ◯ Yes
- ◯ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 4: CHP TECHNOLOGIES AND SYSTEMS AND THEIR INTEGRATION IN OLD/HISTORICAL AND FUTURE BUILDINGS AND EXTERNAL CONNECTIVITY

1 Relevance of the topic to you

The development and demonstration of CHP and CHPC technologies will ensure secure, reliable and efficient power, heat & cold supply for old/historical and new buildings. These technologies may be full integrated with other RE technologies: they can use storable RES (biomass, biogas, underground storage, renewable hydrogen etc.) to produce on-demand electricity and storable heat and cold, while reducing GHG emissions and increasing the primary energy savings.
Activities under this topic might include:

- Reduction of manufacturing and maintenance costs
- Fuel-flexible systems with low/zero emissions
- Higher efficiency through new configurations, more efficient components and the use of new materials
- Power factor correction; grid code compliance; connection with energy storage; off grid capability; integration with stochastic PV generation
- Adaption of the power/heat ratio to different types of buildings and needs
- Flexible power/heat ratio for the overall system adapted to variations throughout the day / year

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 5: ENERGY SYSTEMS, EDUCATION, TRAINING AND CERTIFICATION FOR DIFFERENT BUILDING CATEGORIES

1 Relevance of the topic to you

In order to enhance competitiveness and technical skills of the installers of fossil-fuelled heating equipment, as well as to train RHC system designers:

- An EU information strategy aimed at informing the installers, architects, end users, manufacturers, suppliers etc. of the benefits of working with RE technology must be developed

- The key success factors to make training systems attractive to installers (online, modular approach etc.) must be understood
- Gaps in skills must pinpointed
- A platform for sharing training material and best practice between training providers in different markets must be developed
- Finding out if, and in what way, certification may be an enabler for increasing interest in RE in installers and consumers

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

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7 Are there any RD&I topics/activities missing?

- ○ Yes
- ○ No

8 Which topics/activities are missing in your opinion?

500 character(s) maximum

Section 2.3: RESEARCH AND INNOVATION PRIORITIES FOR RHC IN DISTRICTS

TOPIC 1: ENERGY SYSTEM INTEGRATION

Smart sector integration refers to the interaction between different sectors (buildings, services, transport and industry) and energy carriers (electricity, heat, gas) including storage, leading to energy system optimisation.

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 2: DISTRIBTUTION TEMPERATURES REDUCTION IN HEAT NETWORKS

Identifying measures, technologies and strategies to lower network temperature in order to decrease heat losses while widening the range of renewable heating and waste heat source integration.

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 3: DECARBONISATION – SCENARIO EVALUATIONS AND DECARBONISATION STRATEGIES

Identifying and implementing future sustainable technology scenarios to decarbonise the heating and cooling sector.

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

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7 Are there any topics/activities missing?

- Yes
- No

8 Which topics/activities are missing in your opinion?

500 character(s) maximum

Section 2.4: RESEARCH AND INNOVATION PRIORITIES FOR RHC IN CITIES

TOPIC 1: TECHNOLOGIES FOR INTEGRATED SYSTEM SOLUTIONS OF DECARBONISED ENERGY SYSTEMS OF CITIES

R&I actions to increase the modularity as well as the physical and digital connectivity of all energy components and sub-systems needed for decarbonised energy systems of cities in the field of generation, distribution, conversion, storage and consumption of heat, cold, and electricity from renewable energy sources and waste energy.

R&I actions to develop platform solutions for integrated energy systems, e.g. for district energy systems with a multi-source DHC system coupled with local renewable electricity generation, which enable the integration of components from different producers, but guarantee a high system efficiency by optimised design and operation.

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 2: TOOLS AND GUIDELINES FOR THE PLANNING OF CLIMATE-NEUTRAL ENERGY SYSTEMS FOR CITIES

R&I actions to develop planning tools which allow for the identification of the optimised design for decarbonised energy systems for cities. The energy system planning tools should be based on existing tools, but allow an integrated multi-domain optimisation and should reflect the complexity and dynamic of the decarbonised energy system. It should be usable by local energy experts and should use modern digitalisation methods, e.g. making

use of open data pools and using artificial intelligence methods for optimisation.
R&I actions to develop guidelines for energy planning in cities, taking into account the energy system optimisation by using the energy planning tool (see R&I action above) as well as the other dimensions of the planning process (organization and governance of the planning process, stakeholder participation, duration, work packages and milestones, experts input needed, dimensions to be considered like definition of targets, financing and business models of actions, user acceptance, etc.).

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

TOPIC 3: TOOLS AND GUIDELINES FOR THE DEVELOPMENT OF TRANSFORMATION STRATEGIES AND ROADMAPS TO ACHIEVE DECARBONISED ENERGY SYSTEMS OF CITIES

R&I action to develop methodologies and related tools which help cities to develop transformation strategies and related roadmap to decarbonise their energy systems by 2030 or 2040.

1 Relevance of the topic

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
- No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 What would accelerate your implementations?

500 character(s) maximum

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7 Are there any topics/activities missing?

- Yes
- No

8 Which topics/activities are missing in your opinion?

500 character(s) maximum

Section 2.5: RESEARCH AND INNOVATION PRIORITIES FOR RHC IN INDUSTRIES

1 I am...

- Selling/developing RHC technologies
- Purchasing/using RHC technologies
- Other (specified in Section 1)

TOPIC 1: HYBRIDISATION OF RENEWABLE ENERGY SYSTEMS

How important is R&DI on combination of RES and existing (conventional) technologies towards optimised operational parameters aligned to industrial needs in your opinion?

1 Relevance of the topic to you

- Not relevant
- Moderately relevant
- Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- Yes
-

No

3 What is the focus?

1000 character(s) maximum

4 What was the driver for the realisation?

500 character(s) maximum

5 Which measures are needed to make RES interesting for you?

- ☐ Financing schemes for RES
- ☐ Lower payback
- ☐ Higher TRL
- ☐ Other (please specify below)

6 If you selected *Other* above, please specify

500 character(s) maximum

TOPIC 2: INNOVATIVE TECHNOLOGIES FOR OPTIMISED SYSTEM INTEGRATION OF RENEWABLE ENERGIES

Development of new technologies integrating different RES to provide reliable and on demand energy for industrial processes

1 Relevance of the topic to you

- ○ Not relevant
- ○ Moderately relevant
- ○ Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ○ Yes
- ○ No

3 What is the focus?

1000 character(s) maximum

4 Select RE technology where you see need for development to increase their integration/application?

- ☐ Solar thermal
- ☐ Geothermal

- [ ] Heat pumps
- [ ] District heating
- [ ] Others

5 If you selected *Others* above, please specify

500 character(s) maximum

6 What would you expect from a RE technology?

- [ ] Reliability
- [ ] Reaching certain temperature
- [ ] Predictability of performance/output
- [ ] Other

7 If you selected *Other* above, please specify

500 character(s) maximum

TOPIC 3: DEVELOPING NEW PROCESS TECHNOLOGY CONCEPTS BEING SUPPLIED BY RENEWABLE ENERGY

1 Relevance of the topic to you

- ( ) Not relevant
- ( ) Moderately relevant
- ( ) Very relevant

2 Are you currently integrating/planning to integrate new process technologies?

- ( ) Yes
- ( ) No

3 Which new process technologies are you realising/planning to realise in the coming years?

1000 character(s) maximum

4 Would you be willing to use/adapt your technology towards supplying new process technology concepts?

- ( ) Yes
- ( ) No

5 In which way?

500 character(s) maximum

6 Which process are you addressing in your RD&I activities?

- [ ] Industrial between 80°C - 100°C
- [ ] Industrial between 100°C - 180°C
- [ ] Industrial above 180°C

TOPIC 4: NEW CONCEPTS FOR AWARENESS DISSEMINATION

1 Relevance of the topic to you

- ( ) Not relevant
- ( ) Moderately relevant
- ( ) Very relevant

2 Do you have applications realised or are you planning realisation of applications?

- ( ) Yes
- ( ) No

3 What is the focus

1000 character(s) maximum

4 What would accelerate your implementations?

500 character(s) maximum

5 What was the driver for the realisation?

500 character(s) maximum

6 Which functionalities should a tool have or which information should info material provide in order to offer you an added value?

500 character(s) maximum

7 Would you be open to disseminate experiences on B2B level and information on innovative business models?

- ( ) Yes
- ( ) No

9 Are there any topics/activities missing?

- Yes
- No

10 Which topics/activities are missing in your opinion?

500 character(s) maximum

Section 3 – RD&I trends among RHC stakeholders

Section 3.1 Funding RHC research and development activities

1 Is your company conducting research, development and innovation (RD&I) activities either for its own projects or is it outsourcing RD&I?

- Yes, our company has RD&I activities
- No, our company does not have any RD&I activities

2 Does your company have a dedicated RD&I (or sustainability) department?

- Yes
- No

3 What percentage of your entity´s revenue goes towards RD&I activities in the area of renewable heating and cooling on an annual basis?

- 0%-10%
- 11%-20%
- 21%-30%
- 31%-40%
- More than 40%

4 Has the above percentage changed in the past 3-5 years?

- Yes, it has decreased
- Yes, it has increased
- No, it remained roughly the same

5 Will the above percentage change in the next 3-5 years?

- Yes, it will most likely increase
- Yes, it will most likely decrease
- No, it will most likely remain the same

6 Which of the following sources of funding have your company used for its internal RHC RD&I activities?

- [ ] Equity
- [ ] External funding - Bank loans and venture capital
- [ ] External funding - Reimbursable advances from the government (from national government)
- [ ] External funding - Reimbursable advances from the government (from regional government)
- [ ]

External funding - Reimbursable advances from the government (from the European Union)

- [ ] Non-reimbursable government aid (from national government)
- [ ] Non-reimbursable government aid (from regional government)
- [ ] Non-reimbursable government aid (from the European Union)
- [ ] Payments or financial contributions from other companies (within or outside your company group)

7 Has the sources of funding changed in the past 3 years?

- ( ) Yes
- ( ) No

8 Briefly elaborate how has the sources of funding changed?

500 character(s) maximum

9 At what TRL were your RHC RD&I activities conducted in 2020?

- [ ] Idea / basic research (TRL 0-3)
- [ ] Development - prototype (TRL 4-5)
- [ ] Deployment - validation (TRL 6-7)
- [ ] Production & market introduction (TRL 8-9)

10 What overarching objective do your RHC RD&I activities have? (select all that apply)

- [ ] Improvements to existing products, processes and/or services
- [ ] Development of new products, processes, or services
- [ ] Development for market launch/uptake
- [ ] Improved sales and/or profitability
- [ ] Addressing environmental issues
- [ ] Other (please elaborate below)

11 If you selected *Other* above, please specify

500 character(s) maximum

12 Briefly describe your main internal RHC-related RD&I activities carried out in the last 3 years.

1000 character(s) maximum

13 Is the focus of your main internal RHC-related RD&I activities going to change in the next 3-5 years?

- ( ) Yes
- ( ) No

14 Briefly describe how.

500 character(s) maximum

15 What internal/external factors have the biggest impact on your RD&I activities?

- [ ] Insufficient cash flow
- [ ] Insufficient staffing
- [ ] EU regulations
- [ ] Availability of public funding (incl. EU)
- [ ] Others (please elaborate below)

16 If you selected *Others* above, please specify

500 character(s) maximum

17 Briefly describe what direction do you foresee for the European RHC sectors in the next 5-10 years?

500 character(s) maximum

Section 3.2 - Technological cooperation

1 Did your company, in the last 3-5 years, cooperate with third parties within RD&I framework?

- ( ) Yes
- ( ) No

2 What was the focus of this cooperation?

- [ ] During the cooperation technological knowledge was **developed** which influenced your company's R&D activities
- [ ] During the cooperation technological knowledge resulting from your R&D activities was **exchanged**
- [ ] Other (please elaborate below)

3 If you selected *Other* above, please specify

500 character(s) maximum

4 Are you currently / do you plan future RD&I cooperation with other EU countries?

- [ ] Yes, we are currently cooperating with other EU countries
- [ ] No, but we plan future cooperation with other EU countries
- [ ] No, we do not plan future cooperation with other EU countries

5 Please elaborate your opinion on the importance of RD&I cooperation with other EU countries.

500 character(s) maximum

Section 4 - Policy and miscellaneous

1 Is your company following policy developments at the EU level?

- Yes
- No

2 Is EU policy affecting your company´s RD&I activities?

- Yes
- No

3 Briefly describe how.

500 character(s) maximum

4 Briefly describe which EU policy measures will you prioritise for your company´s future RD&I activities over the next 3-5 years?

500 character(s) maximum

5 How favourable are the following framework conditions to RHC uptake in your country?

	Not favourable at all	Not very favourable	Neutral / no opinion	Favourable	Extremely favourable
Political conditions (political support, policy priorities)					
Legal conditions (regulations, taxes)					
Market conditions (technology, demand and supply, technicians)					
Research conditions (quality and quantity of researchers)					
Social conditions (culture, knowledge, awareness on RHC)					
Financial conditions (financial instruments, incentives)					

6 Please specify the favourability of any other framework conditions to RHC update in you country?

500 character(s) maximum

7 In your opinion, what barriers affect the uptake of RHC solutions in your country?

	Strongly disagree	Disagree	Neither agree nor disagree /No opinion	Agree	Strongly agree
Insufficient information about the benefits of RHC solutions	☐	☐	☐	☐	☐
Uncertainty around the performance of RHC technologies	☐	☐	☐	☐	☐
Volatility in energy provision from renewables	☐	☐	☐	☐	☐
Uncertainty of regulations	☐	☐	☐	☐	☐
Lack of policy support	☐	☐	☐	☐	☐
High installation cost	☐	☐	☐	☐	☐
Risky investments for consumers	☐	☐	☐	☐	☐
Unclear legal situation for consumers, tenants and landlords	☐	☐	☐	☐	☐
Lack of suitable technologies (e.g. platforms, tools, etc.)	☐	☐	☐	☐	☐
Lack of information about national /regional/EU financial support	☐	☐	☐	☐	☐
Lack of skilled personnel for installing RHC solutions and providing support	☐	☐	☐	☐	☐
Lack of environmental public awareness	☐	☐	☐	☐	☐
Unequal access for vulnerable groups of society	☐	☐	☐	☐	☐
Scarcity of renewable energy resources	☐	☐	☐	☐	☐
Higher competitiveness of traditional solutions	☐	☐	☐	☐	☐

8 What other barriers, in your opinion, affect the uptake of RHC solutions in your country?

500 character(s) maximum

Section 5 - Comments and suggestions

1 **Please leave your comments or suggestions**

Comments to clarify your answers

1000 character(s) maximum

2 How long did it take to complete this survey?

3 Difficulties you encountered while completing the questionnaire, or suggestions for improvement

500 character(s) maximum

Thank you very much for taking the time to complete this questionnaire

The European Technology and Innovation Platform on Renewable Heating and Cooling (RHC ETIP) is officially endorsed by the European Commission and its activities are supported by the Horizon 2020 research and innovation programme (GA N° 825998).

Contact us info@rhc-platform.org | Follow us on Twitter @EtipRhc #RHCETIP